GEMPACK USER DOCUMENTATION
Release 9.0

GPD-7
Installing and Using
the Executable-Image Version of GEMPACK
on Windows PCs

Installing and Using the Executable-Image Version of GEMPACK on Windows PCs

GEMPACK Document No. GPD-7

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This is part of the documentation of the GEMPACK Software System for solving large economic models, developed by the IMPACT Project, Monash University, Clayton Vic 3800, Australia.

Abstract

Windows PC computers provide excellent platforms for doing serious general equilibrium modelling. This document describes how to install and use the Executable-Image Version of GEMPACK on a Windows PC. This document also describes how to install the GEMPACK Windows programs including ViewHAR, ViewSOL, RunGEM, TABmate and AnalyseGE and the electronic version of the GEMPACK documentation.

The Executable-Image Version allows the full range of modelling tasks (building new models or modifying existing models).

With a Limited Executable-image licence, models are limited to those that can be implemented and solved within about 32 megabytes of memory. This is large enough for many medium-sized models but not sufficient for large models.

With an Unlimited Executable-image licence, the size of models which can be implemented and solved is limited only by the amount of memory on your PC.

Authors and Earlier Editions

Date	*Author(s)*	*Comment*
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CHAPTER 1

1. The Executable-Image Version of GEMPACK

GEMPACK runs essentially unchanged on a variety of machines. This document tells you how to install the Executable-Image Version of GEMPACK on a Windows PC.

By a "Windows PC" we mean a PC (usually a Pentium) running Windows 98, ME, NT, 2000 or XP.[1].

This document describes

1. how to install and use the Executable-Image version of GEMPACK,
2. how to install and use WinGEM, the Windows interface to GEMPACK, and associated Windows programs, including ViewHAR, ViewSOL, RunGEM, TABmate and AnalyseGE, and
3. how to install electronic versions of the GEMPACK documentation.

The Executable-Image version of GEMPACK can be used to build new models or modify existing models.

With an Limited Executable-image licence (see section 1.9.2 of GPD-1), models are limited to those which can be implemented and solved within about 32 megabytes of memory (even when the computer on which the software is installed has more than this amount of memory). This includes many medium-sized models, but excludes large models such as ORANI or MONASH at the usual disaggregation of 100 or more sectors and many intertemporal models. Precise details of the size of models that can be handled are given in section 6.3.1 below.

With an Unlimited Executable-image licence (see section 1.9.3 of GPD-1), the size of models which can be implemented and solved is limited only by the amount of memory on your PC.

The user documentation for GEMPACK can be found in the other GEMPACK documents.[2] The GEMPACK document GPD-1 *Introduction to GEMPACK* should be your starting point. You can carry out the installation and testing described below without being familiar with GEMPACK. But if you intend to use GEMPACK for modelling, we recommend you at least quickly read chapters 1 to 3 in GPD-1 before attempting any modelling on your PC (and perhaps before you install GEMPACK on your PC).

An introduction to the different GEMPACK programs can be found in section 1.7 of GPD-1, while a guide to the models supplied with GEMPACK (including the Executable-Image version) is given in section 1.8 of GPD-1. A guide to the full user documentation for GEMPACK can be found in chapter 6 of GPD-1. Hands-on examples for GEMPACK can be found in chapters 2, 3 and 4 of GPD-1 and in GEMPACK document GPD-8.

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[1] For Release 7.0 or later, Windows 3.1 is no longer supported.

[2] References to GEMPACK documents identify the document by GEMPACK Document (GPD) number, rather than by author or date. References are always to the version of the document which is current at the date of issue of the cross-referencing document. The GEMPACK documents referenced are listed in a separate section at the end of the References section of this document. Comments from readers on this or any of the GEMPACK documents, either pointing out errors, inaccuracies, omissions or obscurities, or making other suggestions for improvements, will be welcomed. Please address such comments to one of the authors at the Impact Project.

The documentation for Release 9.0 of GEMPACK is in GPD-5. Section 1.3 of GPD-5 contains a guide to the Release 9.0 documentation.

1.1 GEMPACK Programs Supplied with the Executable-Image Version

The GEMPACK programs included with the Executable-Image Version of GEMPACK are:

TABLO	for processing the description of your model
GEMSIM	for carrying out simulations with your model
GEMPIE	for printing simulation results
SAGEM	for carrying out Johansen simulations
MODHAR	for building or modifying Header Array data files
SEEHAR	for looking at Header Array data files
SLTOHT	for converting simulation results to other forms
MKHAR	for moving data files between different computers
RWHAR	for moving data files between different computers
SUMEQ	for obtaining information about Equations files
SEENV	for obtaining information about Environment files
CMPHAR	for comparing data on two Header Array files
ACCUM	for side-joining solutions for spreadsheet programs
DEVIA	for preparing deviations between solutions for spreadsheets
RWSOL	for moving Solution files between different computers
MKSOL	for moving Solution files between different computers
CMBHAR	for combining Header Array files
TEXTBI	for recovering text files from binary files

There are also the Windows programs:

ViewHAR	for viewing and modifying your data files
ViewSOL	for viewing your Solution files
WinGEM	the Windows shell for GEMPACK
GemEdit	Windows text editor sometimes used with WinGEM
RunGEM	for running simulations on an established model, and for sensitivity analysis
TABmate	Windows text editor for working with TABLO Input files
AnalyseGE	for analysing simulation results

Other programs can be obtained from the GEMPACK Web site:

http://www.monash.edu.au/policy/gempack.htm

1.2 Models Supplied with the Executable-Image Version

All the models usually supplied with Source-Code version of GEMPACK are supplied with the Executable-Image Version of GEMPACK. The models currently supplied are those listed in chapter 1 of GPD-8. See also section 1.6 of GPD-5.

The models currently supplied include Stylized Johansen, Miniature ORANI, TRADMOD, ORANIG, ORANI-F, GTAP, DMR, TREES, CRTS and 5SECT. These can all be solved in about 32 megabytes of memory.

1.3 Current Release

The current version of GEMPACK is Release 9.0 (April 2005).

1.4 Contacting the Centre of Policy Studies / Impact Project

For more information about GEMPACK, contact

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Information can be obtained from the GEMPACK Web site:

http://www.monash.edu.au/policy/gempack.htm

CHAPTER 2

2. System Requirements for the Executable-Image Version

Most current Windows PCs easily satisfy the minimum requirements, which are spelled out in section 2.1 below.

Most current Windows PCs have at least 256Mb of RAM.

- All the models which can be solved with a Limited Executable-Image GEMPACK licence (see section 6.3) can be solved with that amount of memory.
- If you have an Unlimited Executable-Image Version, the size of models that you can solve is limited only by the amount of memory on your PC. Some large models require more than 256Mb of memory.

2.1 Summary

1. A Pentium computer, or similar Windows PC.
2. Windows 98, Windows ME, Windows NT, Windows 2000 or Windows XP.[3]
3. Hard disk, requiring at least 100 MB free to install and test GEMPACK.
4. At least 128 MB of memory (RAM).

If your computer easily satisfies the above requirements, you can omit the next section and go on to chapter 3.

2.2 Disk Space Free

You can determine how much disk space is free by:

1. in Windows, right click on the icon for your hard drive in "My Computer" or
2. in a DOS box, entering the DOS command: **dir**
   The number of bytes free is shown on the screen at the end of the output. (1Mb is about a million bytes, so you will need about 100,000,000 bytes free to install, test and use GEMPACK.)

Implementing your own models takes more disk space. The larger the model, the more space you will need.

[3] Windows 95 may be satisfactory. For Release 7.0 and later, Windows 3.1 is no longer supported.

2.3 Memory Required

The amount of memory you have limits the size of models you can build. Our experience is that many models that are being built now can be implemented with 128 MB of RAM.

Recent versions of Windows such as Window XP use more memory. For MSOffice with Windows XP, the Microsoft "Minimum Requirement" is "128 MB of RAM plus an additional 8 MB of RAM for each Office program (such as Word) running simultaneously." Bear in mind that to do useful things with GEMPACK, you'd very often need to have an MSOffice application open at the same time.

Click on **Help | About** in the main menu of **My Computer**. This will tell you how much physical memory is available to Windows.

CHAPTER 3

3. Installation Instructions

The Executable-Image Version of GEMPACK is supplied on a CD. If you do not have a CD drive on your computer, see chapter 7.

The components to install are:

- the Executable-image version of GEMPACK.
  This involves copying executable images of the different GEMPACK programs (as listed in section 1.1) from the CD to the hard disk of your computer. These are the programs you use to solve and modify models.
- Files from the licence (and fix) diskette. Your GEMPACK licence is usually supplied on a 1.44 Mb floppy disk. Select this option to copy your licence file to the directory in which the Executable-Image files are installed.
- Windows GEMPACK programs including:
  WinGEM the Windows interface to GEMPACK.
  ViewHAR used to view data on GEMPACK Header Array files.
  ViewSOL used for viewing Solution files (results of simulations).
  TABmate a text editor for modifying and debugging TABLO Input files.
  GemEdit a text editor sometimes used with WinGEM.
  RunGEM for carrying out simulations with models and for doing sensitivity analysis.
- AnalyseGE the Windows program for analysing simulation results.
- electronic versions of the GEMPACK user documentation.
  You can read or print this GEMPACK documentation using the Adobe Acrobat Reader (which you can also install from the Executable-Image CD if it is not already installed on your computer).

3.1 If You Have An Earlier Release of GEMPACK Installed

If you have an earlier release of GEMPACK installed on your machine, you may prefer to move it before installing Release 9.0, or else to install Release 9.0 in a different directory. Indeed, it is probably best (if you have enough disk space) to leave the earlier version on the disk until you have successfully installed and tested Release 9.0 (in case an unexpected problem occurs).

If you decide to move the existing version before installing Release 9.0, you can use the *Windows Explorer* or *My Computer* to change the name of the directory.

For example, if your GEMPACK directory is currently the default GEMPACK directory C:\GP, you can rename your current GEMPACK directory if you want to save it (for example, to C:\GP9) and then use the default directory C:\GP as the GEMPACK directory. Installing in the same directory means that you do not have to tell the Windows programs such as TABmate and RunGTAP where the Release 9 GEMPACK programs are installed, as described later in section 3.4.4

3.2 Installing Under Windows on a PC

You will install GEMPACK using the Windows installer supplied on the Executable-Image CD. The installation procedure is described in detail in sections 3.3 to 3.5 below.

3.2.1 Security and Permissions

Recent Windows versions such as Windows 2000 and XP have introduced different User Accounts and different grades of Users. The simplest way of operating your computer is when you are the sole user of your computer and have full Administrator/Power User rights when using it to run GEMPACK.

To install GEMPACK, you may need Administrator or Power User privileges. Otherwise, the installer may be unable to change the PATH variable as part of the install procedure.

If you have installed GEMPACK as Administrator, you need to set the permissions so that ordinary Limited or Standard users can access the files. They need to be able to read and execute the programs in the GEMPACK directory. In their working directories, Limited Users need full rights to read, write, execute and delete files.

Under Windows XP, you may find that, if one user has copied files to a directory for use by another user, the files "belong" to the first user and can not be deleted by the second user. If the second user tries to write to a file of the same name as one belonging to the first user, the write fails because the GEMPACK program is unable to delete the old file before creating a new version with the same name.

3.3 Installing from the GEMPACK Executable-Image CD

The Executable-Image Version of GEMPACK is supplied on a CD. If you do not have a CD drive on your computer, please see chapter 7.

Insert the CD into your CD drive. Then select from the **Start Menu**

Run...

and enter in the RUN box,

e:\install.exe (Replace **e:** by the drive letter for your CD – for example, **f:\install.exe**)

After this just follow the install procedure. If you are not sure, read the information below which gives a few more details.

Selecting What to Install

You are first asked to select which components you wish to install. You can select some or all of

1. GEMPACK Executable-image files
2. Files from Executable-image licence (and fix) diskette
3. Windows GEMPACK files (WinGEM etc)
4. GEMPACK documentation (PDF files)
5. AnalyseGE

Click in the check boxes to indicate which you want to install, then click on **Ok**.

If you have been provided with a new GEMPACK licence, it will be supplied on a disk (not on the CD). If you have checked the first item above, you should also check the second item above so that your new licence is copied to your computer as part of the installation procedure. If reading from a floppy diskette is a problem[4], do not check the second item. You can copy the licence file later as described in section 3.5

If the letter sent with your CD indicates that there is a bug fix disk included, you should check the first two items above so that these bug fixes are incorporated into the version of GEMPACK you install.

Selecting the GEMPACK directory

Then you are asked to indicate the folder (another name for "directory") in which to install the relevant components. The default is the directory **C:\GP**. We suggest that you install in this default directory unless you have another version of GEMPACK already there. In that case, perhaps choose directory C:\GP9. However you can choose any directory you please. The GEMPACK programs can handle long file names and directory names, and names containing spaces. However these programs **do not handle non-English characters**. See sections 5.9 and 5.9.3 in GEMPACK document GPD-1 for details.

To choose another directory, click on the **Browse** button. The directory need not exist since the installer will create it for you. Indeed it may be best to choose a directory that does not already exist since, otherwise, the installation procedure may overwrite existing files. After selecting the directory click on **Ok**. **(**When you return to the original screen check carefully that the directory name is what you want. Sometimes the install program adds \GP to the end of the name you have selected.)

Below we refer to this directory, where you are installing GEMPACK, as the **GEMPACK directory**. [Click on **Next** once you have indicated the directory.]

---

[4] For example, some computers can have a CD or alternatively a floppy disk drive but not both at once. In this case copy the licence file later.

Changes to your PATH and Environment ?

Then you will be asked if you wish the Install program to make relevant changes to your PATH and the Environment variable called GPDIR. Details about these changes can be found in section 3.4 below. We recommend that you
respond **yes** if you are installing GEMPACK in a new directory, but recommend that you
respond **no** if you are installing GEMPACK in the same directory which contained an earlier version of GEMPACK.

If you are using Windows NT, 2000 or XP, the installer will carry out the changes to your PATH and GPDIR using the Windows registry.[5] If you are using Windows 95, 98 or ME the installer will change your AUTOEXEC.BAT file. If you prefer to make these changes yourself, say **no** and see section 3.4 about how to change your PATH and set GPDIR.

Installing

The Install program then begins to install the components you have selected. These are done in the following order.

- Windows GEMPACK files (WinGEM etc) [if selected]
- AnalyseGE [if selected]
- GEMPACK documentation (PDF files) [if selected]
- GEMPACK Executable-Image files [if selected]
- Files from Executable-image licence (and fix) diskette [if selected]

3.3.1 Installing WinGEM and Windows Programs

You will be told when the installation of WinGEM and the associated Windows programs starts. The installer lets you choose which of the Windows GEMPACK programs to install. We recommend that you should install all components.

It takes the installer only a few seconds to copy the relevant files into the directory you have chosen. The installer also creates icons for the various programs (WinGEM, ViewHAR, ViewSOL, RunGEM, GemEdit and TABmate) on your desktop.

The destination folder should usually be the GEMPACK directory previously selected.

3.3.2 Installing AnalyseGE

You will be told when the installation of AnalyseGE starts.

We recommend that you install AnalyseGE in your GEMPACK directory but you can use a different directory if you wish. (Note that the name of the EXE file for AnalyseGE is ANALYSGE.EXE.) The installer will create an icon for it on your desktop.[6]

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[5] This was new for Release 8.0 of GEMPACK. Previously we recommended that you carried out these changes yourself by changing the Environment page of the System Properties to add the GEMPACK directory to your path and set a new Environment variable GPDIR to point to the GEMPACK directory (see section 3.4.1). Under Windows NT, 2000 and XP, the GEMPACK Release 8.0 and later installers will
(i) add the GEMPACK directory to your system Path, which will affect all users (you need Administrator privileges to do this),
(ii) set GPDIR only for you (not for other users). [If others use GEMPACK on your PC, they may need to set GPDIR.]

[6] See section 2.4 of GPD-4 for further details about AnalyseGE. See chapter 6 of GPD-8 for a hands-on introduction to the use of AnalyseGE.

3.3.3 Installing the GEMPACK Documentation

You will be told when the installation of the GEMPACK documentation starts. Again it takes the installer only a few seconds to copy the relevant files into the directory you have chosen. The electronic versions of the GEMPACK documentation installed are so-called **PDF files**.[7] These can be viewed or printed with the **Adobe Acrobat Reader**. The installer asks if you want this Acrobat Reader installed. We recommend that you only say **Install** if you do not have any version of this Reader on your PC (otherwise say **Cancel**).

If you choose to install the Adobe Acrobat Reader, the Adobe installer will be run. The installer may take a minute or so to check your computer before beginning the installation. If the Adobe installer suggests rebooting your computer, we suggest that you say **no** so that you complete the other installations first.

3.3.4 Copying the Executable-Image Files

The installation of the GEMPACK Executable-Image files (the installing of the executable images of the GEMPACK programs listed in section 1.1) is done next. You will be told when this part of the installation starts.

3.3.5 GEMPACK Licence/Fix Disk

If you have selected this as part of the installation of the Executable-Image files, you will be asked to insert the licence fix disk in your floppy drive and to select the name of the drive (usually **a:**, but you can change it to **b:** if necessary.) [It will probably take a little longer to copy the licence file from the floppy disk than it took to copy the Executable-image files from the CD.]

If you have copied the licence file to a Flash disk or CD or the network, select the path name of the directory where the licence file LICEN.GEM is stored.

3.4 After A Successful Install, Fix the PATH and GPDIR

For GEMPACK to run easily, you must make sure that the GEMPACK directory (usually C:\GP) is on your PATH, and that the Environment variable GPDIR is set to the GEMPACK directory.

If you allowed the installer to make changes to your PATH and the Environment variable GPDIR (see section 3.3 above), this has already been done. If you are using Windows 95, 98 or ME and the installer made changes to your AUTOEXEC.BAT file, you just need to **restart your computer** now. This will complete the main part of the installation of GEMPACK. Once your computer restarts, you can go on to go to chapter 4 below.

If you did not allow the installer to make changes to your PATH and GPDIR (see section 3.3 above), you must make the required changes yourself. Instructions for making these changes are given in section 3.4.1 below if you are using Windows NT, 2000 or XP, or in section 3.4.2 below for Windows 95, 98 or ME.

3.4.1 PATH and GPDIR for Windows NT, 2000 or XP

If you are using Windows NT, 2000 or XP, the usual method to change the PATH and set the Environment variable GPDIR is by editing the System Properties – see steps 1 to 4 below. This has the advantage that you do not need to reboot your computer afterwards.

---

[7] PDF is an abbreviation for "Portable Document Format".

The important changes are that

- the directory into which you installed GEMPACK must be on your DOS path.
- if this GEMPACK directory is not C:\GP, the DOS environment variable GPDIR must be set equal to the GEMPACK directory.

If you allowed the installer to make these changes, you can check that this has been done correctly using the steps 1 to 4 below. If you did not allow the installer to make these changes, carry out the following steps 1 to 4.

1. Right click on *My Computer*.

   For Windows 2000 or XP, select *Properties* | *Advanced* | *Environment Variables*

   For Windows NT, select *Properties* | *Environment Variables*

2. Select the *Path* variable and add the GEMPACK directory to it (separated by a semicolon ;). You can add the GEMPACK directory to the beginning or end of the current PATH as you prefer. [If you have a previous GEMPACK directory on your Path, replace it with the new GEMPACK directory.] Click on the *Set* button to accept this change.
3. Set a new Environment variable named GPDIR and give it a value C:\GP9 (or whatever your GEMPACK directory is called.) Select the *Set* button to accept this change.
   Note that if you have installed GEMPACK in the default directory C:\GP, it is not necessary to set the Environment variable GPDIR. The GEMPACK programs will assume that C:\GP is the GEMPACK directory, which contains your GEMPACK licence and the GEMPACK programs, if GPDIR is not set.
4. Click on the *Ok* button to accept these changes to the Environment.

These changes will take effect when you next start Windows programs or open a new DOS box.

Test these changes by opening a new DOS box and entering "SET". This should show the altered path and the new Environment variable GPDIR.

3.4.2 PATH and GPDIR Changes in AUTOEXEC.BAT (Windows 95, 98 or ME)

If you are using Windows 95, 98 or ME, the usual method is to use AUTOEXEC.BAT. The installation program may have already made the changes to AUTOEXEC.BAT (with your permission – see section 3.3 above). In that case you must **restart your computer** for the changes to take effect.

If you prefer to make changes to AUTOEXEC.BAT yourself, AUTOEXEC.BAT is a text file in the directory C:\ of your computer. You must edit it in a text editor.

The important changes to AUTOEXEC.BAT are that

- the directory into which you installed GEMPACK must be on your DOS path.
- if this directory is not C:\GP, the DOS environment variable GPDIR must be set equal to this directory.
  Note that if you have installed GEMPACK in the default directory C:\GP, it is not necessary to set the Environment variable GPDIR. If GPDIR is not set, the GEMPACK programs will assume that C:\GP is the GEMPACK directory, which contains your GEMPACK licence and the GEMPACK and programs.

Once you have made these changes, you must **restart your computer** before proceeding. Examples of these changes are given in section 3.4.2.1 below.

3.4.2.1 Example of Changing PATH and GPDIR in AUTOEXEC.BAT

You have installed GEMPACK in a directory on your hard disk. The default directory name for the GEMPACK directory is **C:\GP.** However you may have chosen some other directory name in section 3.3 above. For this example we will assume you have used C:\GP9.

If you have not allowed the installer to make changes to your AUTOEXEC.BAT, you must edit the appropriate file (called AUTOEXEC.BAT in your default directory C:\) which is executed when you turn on your PC. (If you have no such file, create one.) You should add these directories to the PATH line in that file. (Use a text editor, such as the editor EDIT which comes with DOS, or GemEdit or TABmate.)

For example, if you find a line

```
PATH = C:\;C:\WINDOWS
```

you should change it to

```
PATH=C:\;C:\WINDOWS;C:\GP9;
```

Note that it is important not to include any spaces in these lines.

If you do not find a PATH line, make a new line

```
PATH=C:\GP9;
```

(If you installed GEMPACK on a disk drive different from C:, specify that one in the PATH line.) Do not leave any spaces in the PATH line.

If you installed the GEMPACK files in directory C:\GP, no other change is required to AUTOEXEC.BAT. But if you installed these files in another directory, you need to add an extra line to AUTOEXEC.BAT. For example, if you installed the GEMPACK files in directory C:\GP9, add the following line:

SET GPDIR=C:\GP9

(Change this appropriately to indicate where you actually installed these files.) Note that it is important not to include any spaces in this line, apart from the one between SET and GPDIR

3.4.3 Reboot if Necessary

If you are running under Windows 95, 98 or ME, you need to **reboot** your computer to bring these changes to your path and the variable GPDIR into effect.

Rebooting is not necessary under Windows NT, 2000 or XP. Instead just check the PATH and GPDIR as described in section 3.4.1 to see that the PATH and GPDIR are set up correctly. This check activates the new settings for any new DOS box and for any program started from an icon on your desktop. (It does not change the settings for an icon in your Task bar. To change the Task Bar settings, you do need to reboot your computer.)

3.4.4 If You Installed in a New Directory (not C:\GP)

This section does not apply if you have installed GEMPACK in the standard directory C:\GP. It is only relevant if you have installed Release 9 of GEMPACK in a directory which is different from the directory in which you installed your previous version (probably Release 8) of GEMPACK.

You may need to help some windows programs to find and use the Release 9 GEMPACK programs. We give the main examples below.

TABmate. You will need to tell TABmate where to find the Release 9 version of TABLO.EXE. To do this, go to the **Code and other** menu item under the **Options** menu. Then click on the **Change**

button in the **Location of TABLO.EXE** part of the form and find the Release 9 version of TABLO.EXE.

RunMONASH and **RunDynam**. Click on the **Options** menu and use menu items such as **Which ViewSOL to use** to tell the program which versions of ViewSOL, ViewHAR and AnalyseGE to use.

RunGTAP. Click on ***Tools..Options*** and then use the various **Change** buttons to tell RunGTAP where to find the Release 9 versions of Gemsim, ViewHAR, ViewSOL, TABmate, AnalyseGE, Tablo etc.

3.5 Copying the GEMPACK Licence File

Your GEMPACK licence must be called LICEN.GEM and it must be placed in your GEMPACK directory (that is, the directory in which you installed GEMPACK).

If your GEMPACK licence file has been sent on a disk (a floppy disk accompanying the CD), the file LICEN.GEM on that disk will have been copied to your GEMPACK directory as part of the installation process.[8]

If you already have the licence on your computer in another directory, please copy the file LICEN.GEM to your current GEMPACK directory.

If you do not have a floppy disk drive on your computer, you will need to find an old computer with a floppy disk. Copy the licence file from the floppy disk (LICEN.GEM) onto something that your computer can access, for example, a Flash disk in a USB port, a zip disk, a CD or the network. We will be happy to send you the licence file by email if you have problems. Contact GEMPACK as described in section 1.4.

Please see section 1.2 of GEMPACK document GPD-5 for details about GEMPACK licences for Release 9.0.

The types of GEMPACK licences for Release 9.0 are the same types as for Release 8.0 and 7.0 but are different from Release 6.0 licences. Release 7.0, 8.0 and 9.0 licences can be used with Release 6.0 programs.

3.6 Text Editor

When installing and using GEMPACK, you will need to be able to edit text files. This is often best done using a text editor (that is, an editor designed for handling text files exclusively). A text editor EDIT is supplied with DOS or Windows. There are many other text editors available on PC machines.

We recommend that you use the text editor **TABmate.** TABmate has syntax highlighting which is excellent if you are writing or debugging TABLO Input files. TABmate can also be used for other text files, can open several files at the same time and has various Tools that are useful for GEMPACK development.

You can use the older text editor GemEdit.

Alternatively, you can use a word processor (such as Microsoft Word or WordPerfect) to edit text files; if so, you must be careful to save the resulting file as a text file.

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[8] That will happen if you checked "Files from Executable-Image licence (and fix) diskette" as one of the components to install – see section 3.3.5. Otherwise you must copy the file yourself.

3.7 Copying GEMPACK Programs to Other PCs

If you have a GEMPACK site licence, you are entitled to copy GEMPACK programs to PCs covered by your site licence, for example, within the same department or institute.

You should note that the GEMPACK programs TABLO and GEMSIM require a GEMPACK licence. Accordingly, under the terms of your GEMPACK licence, you must not copy (or send copies of) executable images of these to machines outside the site which is covered by your GEMPACK licence.

You are allowed to send copies of the other GEMPACK programs outside of the site covered by your GEMPACK licence. However, you should note that SAGEM.EXE requires at least an Introductory GEMPACK licence to solve larger than medium-sized models (see section 6.3.3).

Of course you must not send a copy of your GEMPACK licence outside the site covered by your licence.

3.7.1 Windows Programs

Anyone (with or without a GEMPACK licence) is entitled to download and install the GEMPACK Windows programs from the GEMPACK web site (see section 1.3 of GPD-1). However a GEMPACK licence may be required to work with larger than medium-sized models. See the Help files for the various programs for details.

The versions of these programs may be updated between GEMPACK Releases. You can check on the GEMPACK web site to see if updates are available. Note that there are separate installs for AnalyseGE and for the other Windows programs.

3.8 Accessing the CoPS Web Pages from the CD

The GEMPACK CD also contains a recent snapshot of the Centre of Policy Studies (CoPS) Web site at Monash University. It is created as a convenience for those who do not have easy or rapid Internet access. Please be aware that the real Web site may well have been updated since this CD was created. The real web address is *http://www.monash.edu.au/policy/*

To access this snapshot of the web site, you do **not** have to be connected to the Internet. However, you do need a Web Browser, such as Netscape or Internet Explorer. Enter the location:

e:\welcome.htm where "e" is the drive letter of your CD drive.

Links pointing to sites outside the Centre of Policy Studies, and *mailto* links have been preserved, but will only function if you are connected to the Internet.

Included in the CoPS Web pages are PDF versions of many of the CoPS/Impact Project Working papers which you can read or print out using the Acrobat reader. A self-extracting EXE archive is included in the ACROBAT directory on the CD for those who do not have the Acrobat reader. You can copy the EXE to your hard drive and run it to install the Acrobat Reader.

CHAPTER 4

4. Testing the Installation

In this chapter we suggest that you test the main features of the installation by carrying out a simulation with the Stylized Johansen model.

If this simulation does not work, you will need to go back to some of the steps in section 3.4 above.

4.1 Making a Directory for the Stylized Johansen Model

Start WinGEM running, following the procedure described in section 2.4.1 of GPD-1. Then prepare a directory for the model SJ (Stylized Johansen) and set the working directory, as described in sections 2.4.2 and 2.4.3 of GPD-1.

4.2 Checking the Path and Access to Your GEMPACK Licence

Before carrying out the test simulations, we suggest that you check that your PATH has been set correctly and that GEMPACK programs are able to access your GEMPACK licence.

To do this, select from the main WinGEM menu

File | Shell to DOS

[That is, click on ***File*** and then click on ***Shell to DOS*** from the menu items which drop down.]

This will start a DOS box running. [If the font in the DOS box is too small to read, change the Font size of the System font. Alternatively, use the dropdown box on the left hand side of the Menu bar to an appropriate size, for example 10 x 18.]

In the DOS box, type in the commands

cd \temp (or some directory where you are able to write files)
tablo

If your PATH is set correctly, the GEMPACK program TABLO will start to run and it will find your GEMPACK licence. In this case you will be offered lots of options for the program TABLO.

Stop TABLO running by typing **Control-C** (that is, hold down the Control key, which is usually on the left of your keyboard and may be labelled "Ctrl", and, while holding it down, touch the C key). TABLO should stop running (though you may need to type Control-C twice). Now type

exit

which should close the DOS box. You are now ready to carry out the test simulations, so please skip to the next section.

1) If TABLO does not start running, your PATH is not as required. This may mean that you didn't allow the installer to change your PATH or to change your AUTOEXEC.BAT file, or perhaps you haven't yet rebooted your computer since you made these changes.
2) If TABLO started running but reported that it could not access your GEMPACK licence, the error message will tell you which licence file the program was trying to access. Please check that your licence file (it must be called LICEN.GEM) is in the directory in which you installed GEMPACK. If the program indicates it is trying to access LICEN.GEM in a directory which is different from the one in which you installed GEMPACK, check the parts of section 3.4 which relate to the Environment variable GPDIR.

You can check that the PATH and GPDIR are correctly set as follows. First go into a DOS box, and then type the DOS command

set

Check that the PATH is as you expect, that is, that it includes the GEMPACK directory (usually C:\GP). If you installed GEMPACK in a directory other than C:\GP, also check that the variable GPDIR has its expected value. If either of these is not as required, read section 3.4 (and check that you rebooted). You can close the DOS box by typing

exit

Repeat this testing once you have remedied any problems. Only proceed when everything is as required.

If you are unable to diagnose the problems here, please click on WinGEM (which should be at the top of your screen). Select

Options | Show Diagnostic Information

Save this information in a file. Then please send (via email or fax) this file (it is a text file) to us at the Impact Project. We will endeavour to assist. Details about how to contact the Impact Project are in section 1.4.

4.3 Simulations to Test GEMPACK and WinGEM

To test that GEMPACK and WinGEM are working correctly, we suggest that you carry out the simulations with Stylized Johansen in section 2.4 of GPD-1.[9] Since you are using an Executable-Image version of GEMPACK, you can not carry out the simulation using a TABLO-generated program in section 2.4.6 of GPD-1. You should carry out the simulation using GEMSIM, as described in section 2.4.7 of GPD-1. When the simulation has finished, check that the results of the simulation are as expected (see, for example, section 2.7 of GPD-1).

If you are a new user of GEMPACK, we recommend that you work through the Stylized Johansen example in chapter 2 of GPD-1, rather than using the brief notes on Stylized Johansen in section 2.4 of GPD-8. Carry out the simulation using GEMSIM (section 2.4.7 of GPD-1) rather than using the TABLO-generated program (section 2.4.6 of GPD-1).

If any of these tests does not work, set the Environment variable TMP as described in section 4.3.1 below and re-check the steps in the installation in section 3.4 above.

4.3.1 Set the Environment Variable TMP

Make sure your Environment variable TMP is set to some simple short directory (for example C:\TEMP) or similar.

A GEMPACK windows program will often need to create various temporary files. The program has to locate a folder in which to create these files.

The actual location of the "temporary" folder is defined by your system. The name of a directory suitable for holding temporary files should be stored in the Environment variable TMP (or TEMP).

Problems may arise if:

(i) you have no "temporary" folder.

(ii) you are not allowed to create or modify files in the "temporary" folder.

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[9] If you are an experienced GEMPACK user, you may prefer to use the brief notes in section 2.4 of GPD-8, instead of GPD-1.

(iii) the full pathname of a temporary file is very long, or contains spaces or Asian characters or non-English characters.

- **If you are running Windows 2000 or XP**

You can right-click on "My Computer" and select "Properties | Advanced | Environment Variables"

and then edit the User Environment variable called TMP to be C:\TEMP.

Create a new folder C:\TEMP if you do not already have one.

- **If you are running Windows NT**

You can right-click on "My Computer" and select "Properties | Environment Variables"

and then edit the User Environment variable called TMP to be C:\TEMP.

Create a new folder C:\TEMP if you do not already have one.

- **If you are running Windows 95, 98 or ME**

You need to change your AUTOEXEC.BAT file. For example, put the line

```
set TMP=c:\temp
```

to set TMP to point to directory c:\temp. You need to reboot after making a change to AUTOEXEC.BAT.

4.3.2 Keep and Temporary Directories and GEMPACK Windows Programs

Some changes have been made to cope with changes in Windows 2000 and XP. The older versions of the GEMPACK Windows programs used to write INI files and temporary files in subdirectories of the Windows directory. This causes problems under Windows 2000 and XP where a "standard" user may not be allowed to write or delete files in the Windows directory or any subdirectory of it.

- The position of the Keep Directory where the INI files are stored has been changed to a subdirectory of the user's "My Documents" directory.
- The default place where GEMPACK Windows Programs write temporary files has been moved from under the Windows directory to a subdirectory of the (user's) TMP or TEMP Environment variable.[10] You can reset the TMP variable as described in section 4.3.1.
- In RunGEM, WinGEM, AnalyseGE and RunMONASH there are Menu Options within the programs which allow you to set your Temporary directory to a directory of your choosing. The program remembers this Temporary directory setting. When you start the programs for the first time, the default temporary directory is set from the value of the TMP or TEMP environment variable.
- For very unusual cases, there are new ways to avoid problems with the Keep and the default Temporary directories by setting environment variables called GPKEEP and GPTEMP.
  Set a new environment variable called GPKEEP if you want to change the usual Keep Directory.
  Set a new environment variable called GPTEMP if you want to change the default temporary directory without changing the environment variable TMP.

If you are having problems with these features of one of the GEMPACK Windows programs, consult the relevant Help file for details and advice.

[10] For example if your Environment variable TMP is set to C:\TEMP, the default temporary directory for WINGEM would be C:\TEMP\GPTEMP\WINGEM.

CHAPTER 5

5. Hands-On Computing on the PC

In this chapter we give suggestions for hands-on computing which will help you to become familiar with many important features of the use of GEMPACK on a PC. These are based on the models supplied with GEMPACK (see chapter 1 of GPD-8), especially the Stylized Johansen and Miniature ORANI models.

Note that the files corresponding to the example models sent with GEMPACK are all in the EXAMPLES subdirectory of your GEMPACK directory (usually C:\GP\EXAMPLES).

We recommend that you follow the Windows way of working as described in section 5.1 below unless you prefer to work at the DOS prompt, in which case you should follow section 5.2 below.

5.1 Using WinGEM

Detailed suggestions for hands-on computing using WinGEM can be found in chapter 2 of GPD-8. This begins with examples based on the Stylized Johansen and goes on to examples based on Miniature ORANI, GTAP and ORANIG. You should ignore the examples there using TABLO-generated programs.

5.2 Not Using WinGEM

Detailed suggestions for hands-on computing without using WinGEM can be found in chapter 3 "Unix/DOS Prompt: Hands-on Computing" of GPD-8. This begins with examples based on the Stylized Johansen and goes on to examples based on Miniature ORANI. You should ignore the examples there using TABLO-generated programs.

CHAPTER 6

6. Building Your Own Models

This chapter contains other information relevant to working with GEMPACK on your Windows PC. Most of it applies whether you are running WinGEM or not (though most of the changes discussed below need to be made in DOS or in a DOS box).

6.1 New Model's Directory Location

We suggest that you put each new model that you build in a separate directory on the hard disk, outside of \GP. Note that your PATH setting will ensure that the GEMPACK programs are found correctly when, for example, you (or WinGEM) issue the command **tablo**

When you use WinGEM with any model, make sure that you set WinGEM's working directory to point to the directory containing the files for this model (as spelled out in section 2.4.3 of GPD-1).

6.2 Lahey or Fujitsu Data Files

Binary files (most importantly, GEMPACK Header Array files – see section 3.1 of GPD-4) produced by LF90 programs are referred to as **Lahey** Files. We refer to the files produced by LF95 and LF as **Fujitsu** files to distinguish them from Lahey files.

The executable image programs (for example, GEMSIM.EXE) supplied with Release 9.0 and later of the Executable-Image Version of GEMPACK were produced using the Lahey/Fujitsu fortran compiler.[11] Hence

- the examples data files (for example, SJ.DAT) we supply with the Executable-Image Version are Fujitsu ones.
- the output files you produce when you run simulations will be Fujitsu files.

Note that GEMPACK programs from Release 7.0 or later can read binary files of either type, by converting the file to a temporary file of the correct type for your compiler. See chapter 15 of GPD-4 for details.

If you receive a Lahey file from someone else who uses the LF90 compiler, your Executable-Image Version GEMPACK programs can read this file. Or you can convert it to a Fujitsu file by using the conversion program (CONLF or ConvHAR – see section 15.1 of GPD-4) if you wish to use it extensively.

Note however that GEMPACK programs from Release 6.0 or earlier cannot read Fujitsu files. These files must be converted first to Lahey files, following the procedures described in chapter 15 of GPD-4.

More details about this topic can be found in chapter 15 of GPD-4.

6.3 If Your Model Becomes Too Large

This may happen because you have exceeded the limits on your Executable-Image licence, or because you have run out of available memory on your computer.

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[11] For Release 8.0 and earlier, the executable image programs distributed with the Executable-Image Version of GEMPACK were produced using LF90.

6.3.1 Limited Executable-Image Licence Limits

This subsection applies if you have a Limited Executable-Image GEMPACK licence. It does not apply if you have an Unlimited Executable-Image licence (see section 1.9 of GPD-1).

A limit is imposed on the size of the models you can carry out simulations with using this Executable-Image Version of GEMPACK. **The only program that may end with an error because your model has exceeded these limits is GEMSIM.** The limits only apply to simulations. There are no limits imposed on the size of data-manipulation tasks you can carry out with the Executable-Image version of GEMSIM.

We expect that all simulations that could have been carried out with the Release 8.0 Executable-image version of GEMPACK will also be allowed with the Release 9.0 Executable-image version.

The limits on the size of simulations that this Executable-Image version of GEMSIM can solve are:

- Total number of (components of) endogenous variables, including any backsolved for, must be no more than 30,000.
- Total number of (components of) variables (exogenous and endogenous, including any backsolved for) must be no more than 35,000.
- Total number of (components of) endogenous variables in the condensed system must be no more than 10,000.
- Total number of (components of) variables (exogenous and endogenous) in the condensed system must be no more than 16,000.
- Number of nonzeros in the Left Hand Side (LHS) Matrix (for any step of the simulation) must be no more than 75,000.
- Total number of reals and integers used for coefficients (pre-simulation and updated), plus those used to store simulation results, must be no more than 250,000.
- Total number of components of variables (in the condensed system or backsolved for) with one argument[12] and more than 40 components must not be more than 1000. [This condition should only affect single-country models with more than 40 sectors.]

All the other programs supplied with this Executable-Image version should be able to handle arbitrarily large tasks, subject only to the amount of memory on your computer.

If a simulation you are carrying out exceeds the limits for the version of GEMSIM supplied with this Executable-Image version of GEMPACK, you will receive a message like the following one.

```
%% This simulation has exceeded the dimensions allowed with GEMSIM
      for your type of Executable-image GEMPACK licence.
  To continue you would need a source-code version of GEMPACK
    (or an "Unlimited Executable-image" licence, if appropriate for you).
  You can obtain these from the GEMPACK distributors.
```

This will be followed by details telling you by how much your simulation has exceeded the limits specified above.

[12] Variables with two or more arguments, only one of which ranges over a set of size more than 1, are also included here.

With the Limited Executable-Image Version, your main alternative is to find another way of carrying out the same task. The only other alternative is to obtain a more powerful version of GEMPACK, either a Source-code version or an Unlimited Executable-image version.

6.3.2 Limits for TABLO-generated Programs with No Licence

The limits shown above in section 6.3.1 for GEMSIM are also the limits for a Release 9.0 TABLO-generated program without any form of GEMPACK licence. If a simulation with a TABLO-generated program exceeds any of these limits, it will require at least an Introductory licence[13] – see section 1.9.3 of GPD-1.

6.3.3 Limits for SAGEM

SAGEM does not require any licence for medium-sized models.

- If you have any GEMPACK licence [Introductory, Limited or Unlimited Executable-image, or Source Code], there are no limits (apart from the total memory on your computer) on the size of models which can be solved using SAGEM. This applies even if you have an old or expired licence.
- If you have no licence, the same limits apply for **SAGEM** simulations as for GEMSIM simulations, namely

(i) Total number of (components of) endogenous variables in the Equations matrix must be no more than 10,000.

(ii) Total number of (components of) variables (exogenous and endogenous) in the Equations matrix must be no more than 16,000.

(iii) Number of nonzeros in the Left Hand Side (LHS) Matrix (for any step of the simulation) must be no more than 75,000.

6.3.4 Not Enough Memory Available on Your Computer

If the task you are carrying out with any of the programs supplied with the Executable-Image version of GEMPACK requires more memory that is available on your computer, you will receive a message saying that the program is stopping because it is

unable to allocate sufficient memory.

If this happens, you may be able to free up more memory by closing down any other applications running (for example, word processors), in which case you can then try to rerun the task. Otherwise you need to find some other way of carrying out the task (or buy more memory).

6.4 Using GEMPACK in a DOS Box

If you prefer to, or need to, work in a DOS box, we strongly suggest that you always work in the DOS box that WinGEM provides via the Menu option:

File | Shell to DOS

The settings of this DOS box have been designed to produce good productivity, especially for GEMPACK users who are running long simulations in a DOS box and simultaneously working with other Windows programs (for example, word processing or spreadsheet programs). In particular,

[13] Prior to Release 7.0, an Introductory licence was called a Large-Simulations licence.

programs running "in the background" in these DOS boxes usually receive a reasonable fraction of total CPU time without disrupting the foreground task.

New command line options for some programs are introduced in Release 9.0 – see section 10.1 of GPD-5 for details. If you like working at the DOS prompt, or if you use DOS batch files (see section 6.7), you will probably make considerable use of these command line options.

Example

The command

tablo sj –pgs –log sj.log

provides complete user input for running TABLO to produce output for GEMSIM (-pgs) and the log file SJ.LOG.

6.5 Using Stored-input Files in a DOS Box

You can use Stored-input files under DOS either via the GEMPACK **sti** option, or using the command line **-sti** feature (see section 5.5 of GPD-1), as in, for example,

modhar -sti modsj.sti

You can create Stored-input files using option **sif** – see section 4.3 of GPD-1 for introductory examples.

If you make your own Stored-input files using a text editor, it is a good idea to include the line

bat

at the start of these files. This means that, if the program encounters invalid input, it will stop. (See section 5.3 of GPD-1.)

We do not recommend using input redirection as in "modhar < modsj.sti". We have found that the **-sti** feature is more robust, especially under Windows NT, 2000 and XP.

6.6 Interrupting Programs and Controlling Screen Output

This section only applies when you are running under DOS or in a DOS box.

6.6.1 Interrupting Programs

Sometimes you will start a program running and then realise that it is not doing what you intend. You can interrupt the program and return to the DOS prompt by typing Control-C (that is, hold down the Control key, which is usually on the left of your keyboard and may be labelled "Ctrl", and, while holding it down, type C). Sometimes you may have to type Control-C twice to achieve this.

6.6.2 Controlling Screen Output

Often screen output goes much too quickly for you to read. You can control it using the

Control-S Control-Q

keystrokes. (For Control-S, hold down the Control key, which is usually on the left of your keyboard and may be labelled "Ctrl", and, while holding it down, type S).

Use Control-S to stop the screen output and Control-Q to start it again. You can repeat these as needed. However, if you get out of step, say by typing two Control-S in a row, you will

lose control of the output and have to wait until the program ends; even Control-C (see section 6.6.1 above) will probably fail then.

On some machines the Scroll Lock key works in a similar way. (It first stops screen output, then starts it, then stops it, and so on.)

6.6.3 Use a Log File to See Screen Output

If the screen output is too fast for you to read, you can always save a GEMPACK log file. This is just a text file that contains all the output to the screen. See section 5.5 of GPD-1. For example,

modhar -sti modsj.sti -log modsj.log

saves a log file called MODSJ.LOG which you can look at in your text editor.[14]

6.7 DOS Batch Files

If you create DOS batch (.BAT) files for carrying out tasks including running GEMPACK programs, you may like to take advantage of the fact that, if any GEMPACK program ends with a fatal error, it sets the value of the DOS parameter ERRORLEVEL value to 1. You can test for this in .BAT files to stop the batch job early in such a case.

For example, the .BAT file below runs SAGEM and then GEMPIE. If the SAGEM run ends unsuccessfully, the test of ERRORLEVEL after it aborts the batch job and gives a message saying that the job was unsuccessful.

```
REM Beginning of batch file
REM  Run SAGEM
REM Next uses the –sti option (see section 5.5 of GPD-1)
sagem  -sti sag1.sti  -log sag1.log
REM test ERRORLEVEL to see if this was successful
if errorlevel 1 goto error
REM  Run GEMPIE
gempie -sti gemp1.sti -log gemp1.log
if errorlevel 1 goto error
echo off
echo BATCH JOB SUCCESSFUL
goto endbat
:error
echo off
echo *** ERROR: BATCH JOB FAILED ***
:endbat
REM End of batch file
```

All GEMPACK programs have options **dro** and **dre** which can be used in BAT files to check whether or not a program has run successfully. See section 5.4.1 of GPD-1 for documentation about these options and for an example BAT file showing how they can be used. These provide an alternative to the use of ERRORLEVEL tests, the effects of which can be difficult to predict and can vary slightly between the different versions of Windows.

Provided your GEMPACK programs are made with Release 6.0 or later of GEMPACK, we strongly recommend that you use "-sti" (as above – see also section 6.5) to run GEMPACK programs in a DOS batch file (rather than using input redirection). We have found "-sti" more robust under Windows NT than input redirection. The same applies to "-log" (rather than output redirection) if you want to generate a LOG file – see also section 6.6.3.

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[14] We have found using "-log" more robust than output redirection via ">", especially under Windows NT, 2000 and XP.

New command line options for some programs are introduced in Release 9.0 – see section 10.1 of GPD-5 for details. You may be able to use these command line options to reduce the number of Stored-input files you need in your batch files.

CHAPTER 7

7. If You Are Unable to Install from a CD

If you do not have a CD drive on your PC, you may be able to copy the contents of the CD temporarily to your server and access the files on your PC from the server (see section 7.1).

7.1 Installing from the CD Copied to the Network

If you copy all the files from the GEMPACK CD onto the network file server, you can use the files so copied to install on other machines (including those without a CD drive) attached to the network.

To do this, use *My Computer* or *Explorer* to copy **all** files in the top directory **e:** and **e:\ACROBAT** from the GEMPACK CD to a directory on the network (and appropriate subdirectories).[15] There is no need to copy the files for the CoPS Web pages in directory **e:\HTM**. Then you can run the copied INSTALL.EXE to install GEMPACK on the network or on other machines which have access to the network.[16]

7.2 Installing from the CD Copied to a USB Flash Disk

Similarly, if you copy copy **all** files in the top directory **e:** and **e:\ACROBAT** from the GEMPACK CD onto a USB Flash Disk, you can use the files so copied to install on other machines (including those without a CD drive).

[15] Here we are assuming that your CD is drive e: . [Change this as appropriate.]

[16] Suppose, for example, that you have copied all files (including those in all subdirectories) from the CD into directory V:\DATA\INSTALLS. Then you can Run program V:\DATA\INSTALLS\INSTALL.EXE to install GEMPACK.

REFERENCES

8. GEMPACK DOCUMENTS

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