



An Introduction to GAMS with GAMS Studio: Part 1



GAMS & GAMS Studio, 2025

© cgemod

1

1



Outline

- Introduction
- GAMS licence
- Installing GAMS & GAMS Studio
- Running a First GAMS Programme
- Testing a GAMS/GAMS Studio Installation



GAMS & GAMS Studio, 2025

© cgemod

2

2





Introduction

- General Algebraic Modeling System (GAMS)
 - High level programming language
 - Mostly used to solve optimisation problems
 - Allows preparation of transparent programmes
- GAMS consists of
 - Base Module
 - Series of solvers
 - GAMS Studio



GAMS & GAMS Studio, 2025

© cgemod

3

3



Introduction

- GAMS
 - allows use of specialised solvers without knowledge their syntax;
 - separates data and the logic of a problem;
 - a GAMS programme is its own documentation; and
 - looks after a number of common programming problems, e.g., dimensionality.
- “GAMS was developed to [overcome a series of mathematical programming problems] by
 - Providing a high-level language for the compact representation of large and complex models
 - Allowing changes to be made in model specifications simply and safely
 - Allowing unambiguous statements of algebraic relationships
 - Permitting model descriptions that are independent of solution algorithms” (Brooke *et al.*, 1998, p1).



GAMS & GAMS Studio, 2025

© cgemod

4

4



Introduction

- This course
 - Requires the demo/student version of GAMS that is free from the GAMS website;
 - Uses GAMS Studio as the editor programme;
 - The documentation assumes the user is using a PC with the Windows operating system
 - GAMS and GAMS Studio are available for MacOS and Linux based systems



GAMS & GAMS Studio, 2025

© cgemod

5

5



Installing GAMS



GAMS & GAMS Studio, 2025

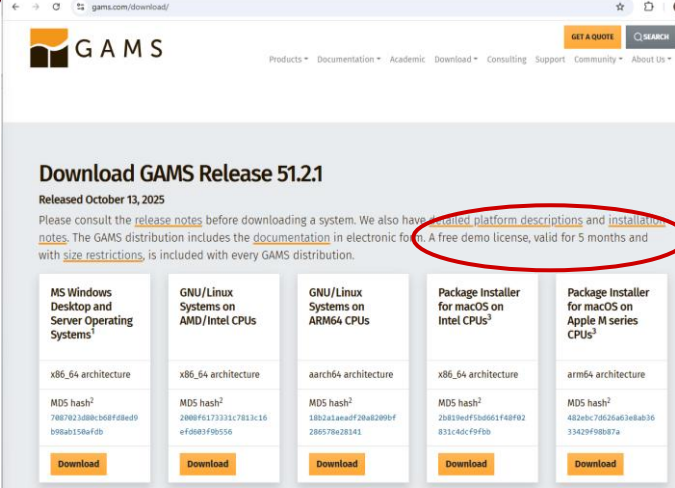
© cgemod

6

6

cgemod

GAMS Demo Licence



MS Windows Desktop and Server Operating Systems ¹	GNU/Linux Systems on AMD/Intel CPUs	GNU/Linux Systems on ARM64 CPUs	Package installer for macOS on Intel CPUs ²	Package installer for macOS on Apple M series CPUs ³
x86_64 architecture	x86_64 architecture	aaarch64 architecture	x86_64 architecture	arm64 architecture
MDS hash ² 790702388c368f88e99 b9ab158afdb	MDS hash ² 2908f6273331c7813c36 ef0b03f90556	MDS hash ² 1802a3a0df28a82090f 280578a28141	MDS hash ² 29833e0f3b0661f40f92 833c44cf9f0b	MDS hash ² 4829bc7802d463ebab36 33429f88b87a
Download	Download	Download	Download	Download

Demo license adequate for

- Intro to GAMS & GAMS Studio
- Introduction to Practical CGE Course

GAMS & GAMS Studio, 2022

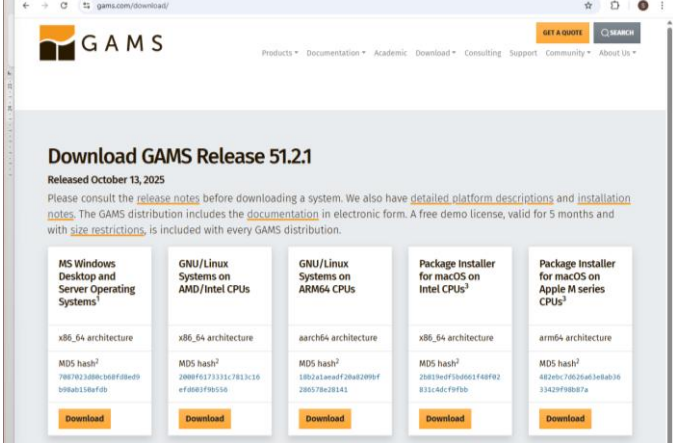
© cgemod

7

7

cgemod

www.gams.com/download/



MS Windows Desktop and Server Operating Systems ¹	GNU/Linux Systems on AMD/Intel CPUs	GNU/Linux Systems on ARM64 CPUs	Package installer for macOS on Intel CPUs ²	Package installer for macOS on Apple M series CPUs ³
x86_64 architecture	x86_64 architecture	aaarch64 architecture	x86_64 architecture	arm64 architecture
MDS hash ² 790702388c368f88e99 b9ab158afdb	MDS hash ² 2908f6273331c7813c36 ef0b03f90556	MDS hash ² 1802a3a0df28a82090f 280578a28141	MDS hash ² 29833e0f3b0661f40f92 833c44cf9f0b	MDS hash ² 4829bc7802d463ebab36 33429f88b87a
Download	Download	Download	Download	Download

1. Get the GAMS programme from the GAMS web site
 - Save the file (e.g., windows_x64_64.exe) on your PC
2. The Linux and Mac OS versions support GAMS Studio
3. The instructions in this presentation refer to the Windows version & GAMS Studio

GAMS & GAMS Studio, 2025

© cgemod

8

8



cgemod

Installing GAMS

1. Run the GAMS installer file

2. Select the directory in which GAMS will be installed

3. We recommend using C:\GAMS – this is not the default

Setup - GAMS

Welcome to the GAMS Setup Wizard

They will install GAMS 23.2.0 on your computer. It is recommended that you close all other applications before continuing. Click Next to continue, or Cancel to exit Setup.

☐ Use advanced installation mode

Next Cancel

Setup - GAMS

Select Destination Location

Where should GAMS be installed?

Setup will install GAMS into the following folder:

To continue, click Next. If you would like to select a different folder, click Browse.

C:\GAMS

Browse...

At least 1.75 GB of free disk space is required.

Back Next Cancel

GAMS & GAMS Studio, 2025

© cgemod

9

9

cgemod

Installing GAMS 2

4. GAMS Studio as the editor

5. Demo: select ‘Browse for license’

6. Full license: select ‘License from Access Code’

“The core of this method is a **36-character access code** that enables users to retrieve their GAMS license from a license server. The server provides an eight-line text-based license file that needs to be stored in one of several standard locations on the user’s hard drive so GAMS can find it.”
GAMS documentation

7. Complete the GAMS Setup Wizard choose - ‘Launch GAMS Studio’

Setup - GAMS

Ready to Install

What do you want to do when installing GAMS on your computer?

Destination Location: C:\GAMS

Destination Folder: C:\GAMS

Additional Tools: GAMS Compiler (GAMS2320.exe), GAMS Solver (GAMS2320.exe), GAMS Studio (GAMS2320.exe), GAMS License (GAMS2320.exe)

Next Install Cancel

Setup - GAMS

GAMS License

Choose a license to be used

☐ Browse for license file

☐ License from Access Code

☐ License from Access Code

Next

Setup - GAMS

Completing the GAMS Setup Wizard

What do you want to do when installing GAMS on your computer? The application may be launched by clicking the icon below.

☒ Launch GAMS Studio

☐ Other application

☐ Sign up for GAMS Newsletter

Next Finish

GAMS & GAMS Studio, 2025

© cgemod

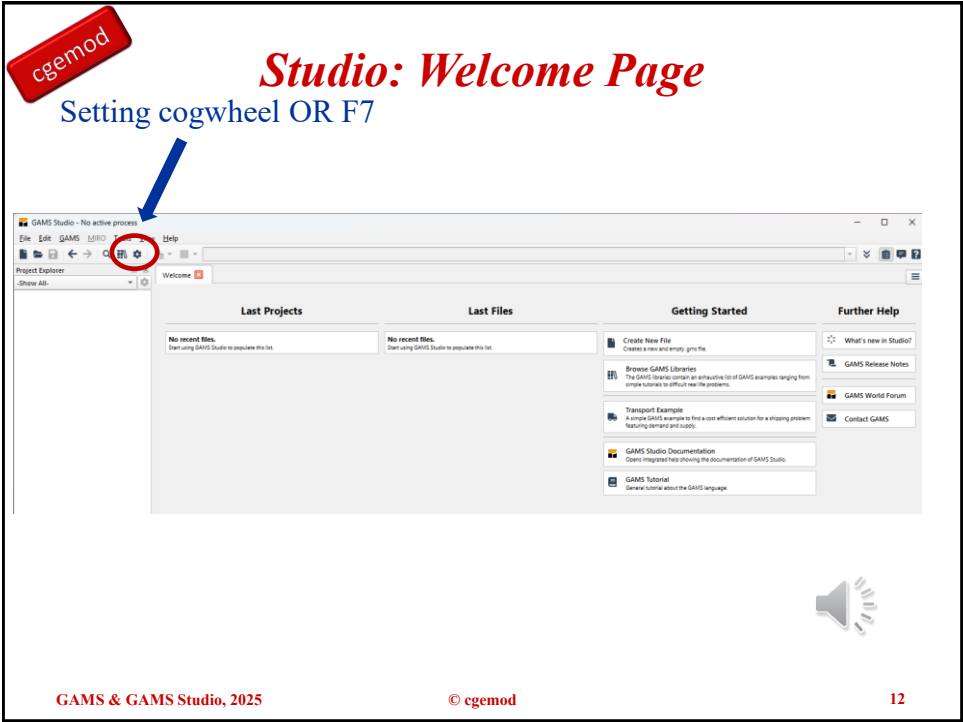
10

10

5

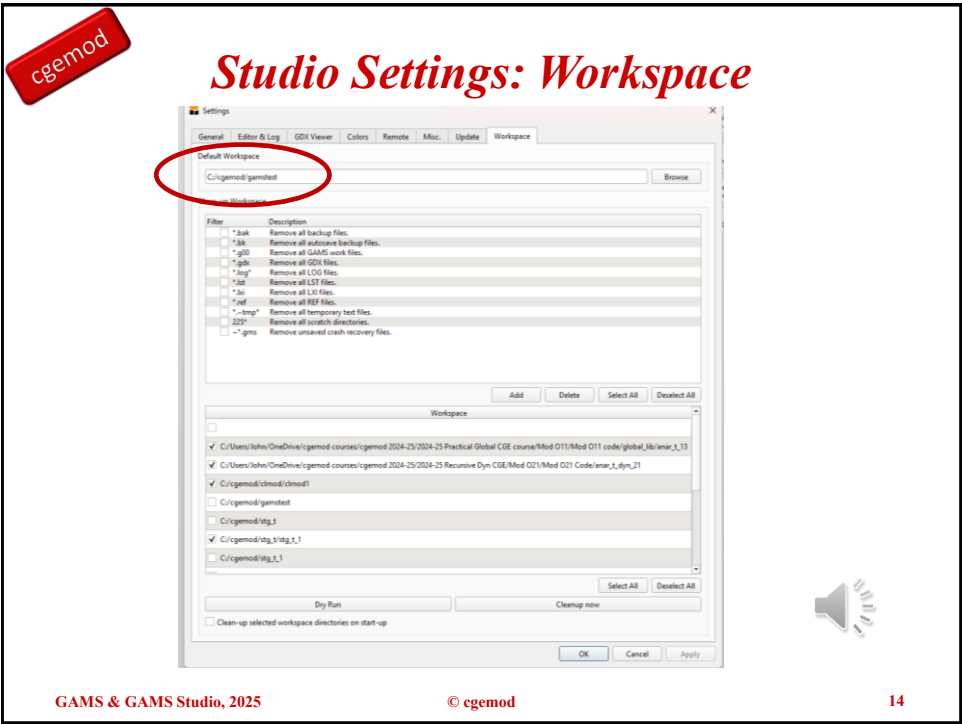
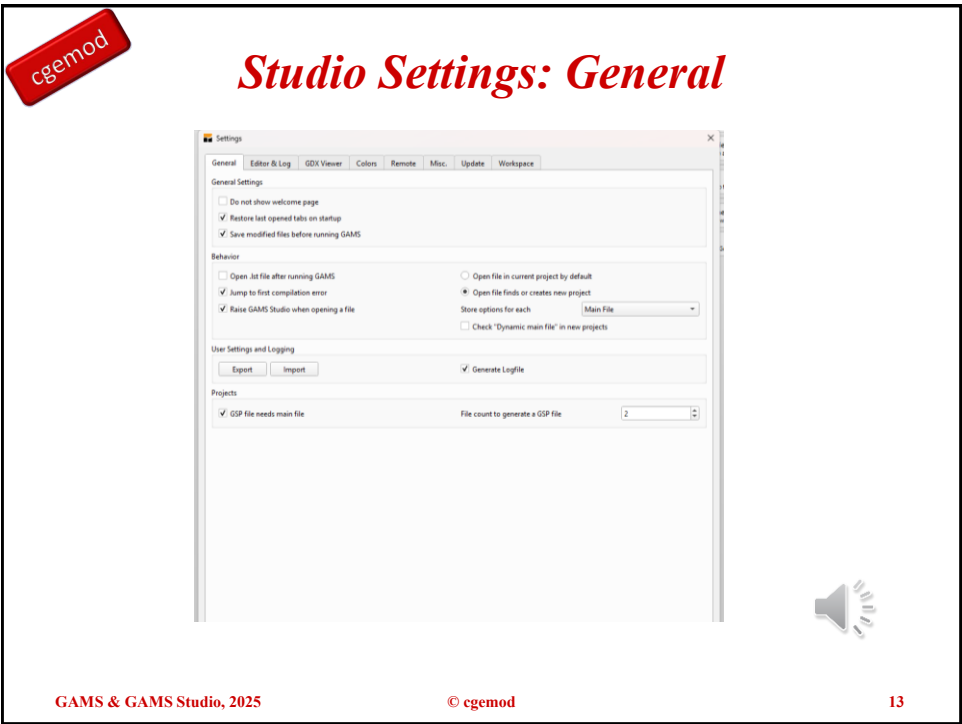


11



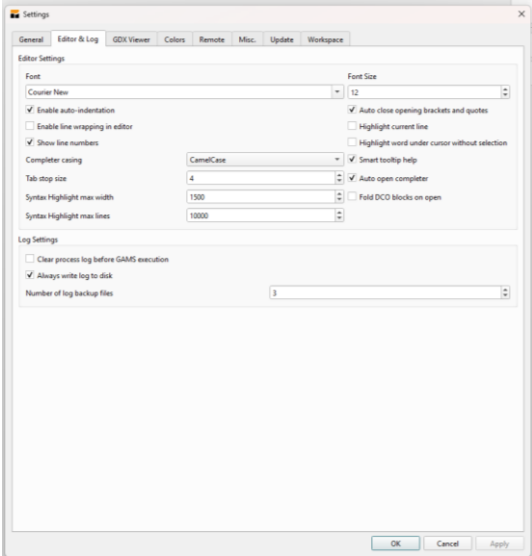
12





cgemod

Studio Settings: Editor & Log



GAMS & GAMS Studio, 2025

© cgemod

15

15

cgemod

A First GAMS Programme

GAMS & GAMS Studio, 2025

© cgemod

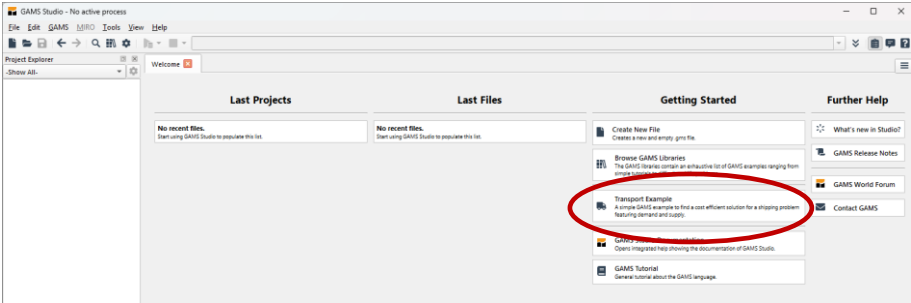
16

16



cgemod

Using GAMS Studio: A First Programme



GAMS & GAMS Studio, 2025

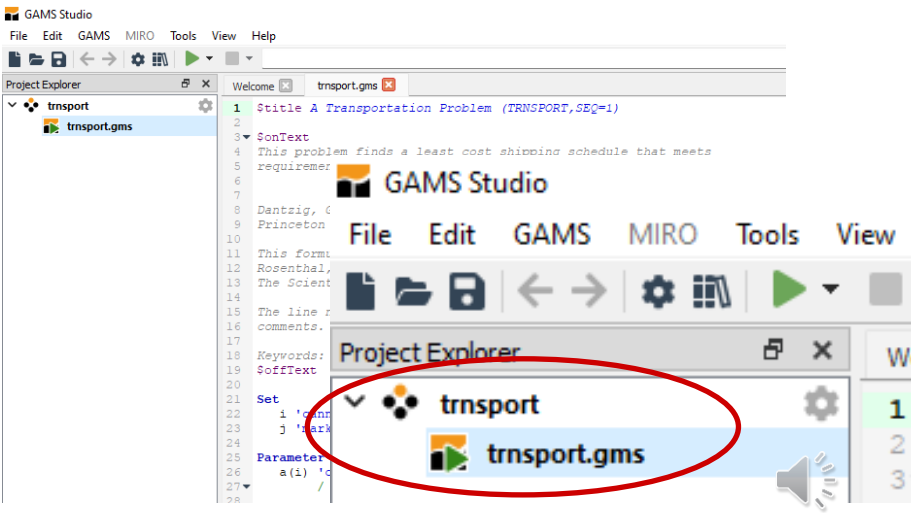
© cgemod

17

17

cgemod

GAMS Studio: First Programme 1



GAMS & GAMS Studio, 2025

© cgemod

18

18



cgemod

GAMS Studio: First Programme 2

Run trnsport.gms: select GAMS>Run with Create GDX and Ref OR F10

GAMS Studio - No active process

File Edit GAMS MIRO Tools View Help

Run F9

Compile Shift+F9

Run with Debugger F11

Step start with Debugger Shift+F11

Run with ... F10

Run with the selected options Shift+F10

Run NEOS

Run GAMS Engine

Interrupt F12

Stop Shift+F12

Model Library Explorer F6

Clean all Workspaces

Default GAMS Configuration

trnsport.gms

Transportat...

☒ Create GDX

☒ Create RF

☐ Profiling

Version identifier: 22.1.0.0 | 2022-03-09 | 1a383f3ce

CPXPARAM_Advance 0

CPXPARAM_Simplex_Display 2

CPXPARAM_Threads 1

CPXPARAM_MIP_Display 4

CPXPARAM_MIP_Pool_Capacity 0

CPXPARAM_MIP_Tolerances_AbsMIPGap 0

LP Presolve eliminated 0 rows and 1 columns.

Reduced LP has 5 rows, 6 columns, and 12 nonzeros.

Presolve time = 0.00 sec. (0.00 ticks)

Iteration Dual Objective In Variable Out Variable

1 73.125000 x(seattle,new-york) demand(new-york) slack

2 119.025000 x(seattle,chicago) demand(chicago) slack

3 153.675000 x(san-diego,topeka) demand(topeka) slack

4 153.675000 x(san-diego,new-york) supply(seattle) slack

--- LP status (1): optimal.

--- Cplex Time: 0.00sec (det. 0.01 ticks)

Optimal solution found

Objective: 153.675000

Reading solution for model transport...

Exporting solution to workspace...

transport.gms (66) 4 MB

RefFile C:\Users\lramc\OneDrive\Documents\GAMS\Studio\workspace\transport.ref

GDX File C:\Users\lramc\OneDrive\Documents\GAMS\Studio\workspace\transport.gdx

Status: Normal completion

Job transport.gms Stop 08/07/22 16:33:15 elapsed 0:00:00.099

GAMS & GAMS Studio, 2025

© cgemod

19

19

cgemod

gamstest Directory

Project name

GAMS Studio - No active process

File Edit GAMS MIRO Tools View Help

trnsport

trnsport.gdx

trnsport.gms

trnsport.lst

trnsport.ref

Open Location

Open Terminal

Open Log Tab

Create EPI File

Add Existing File

Add New File

Add New Solver Option File

Add New GAMS Parameter File

Clean

Select All

Collapse All Projects

Expand All

New Project...

Open Project...

Move Project File...

Copy Project...

Focus Project

Remove Project

Delete Project File

Local Disk (C:) > cgemod > gamstest

Name	Date modified	Type	Size
trnsport.gdx	28/10/2025 09:15	GAMS File	2 KB
trnsport.gms	28/10/2025 09:13	GAMS File	2 KB
trnsport.gpj	28/10/2025 09:15	GAMS Studio proj...	1 KB
trnsport.log	28/10/2025 09:15	Text Document	4 KB
trnsport.lst	28/10/2025 09:15	LST File	9 KB
trnsport.lxi	28/10/2025 09:15	LXI File	1 KB
trnsport.ref	28/10/2025 09:15	REF File	10 KB

Right-click on the project label.

Choose 'Open Location'

Location path

GAMS & GAMS Studio, 2025

© cgemod

20

20

10

cgemod

Testing GAMS Installation



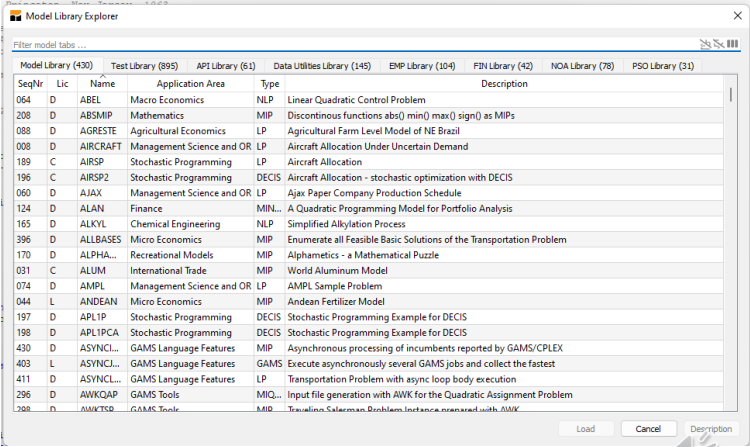
GAMS & GAMS Studio, 2025© cgemod21

21

cgemod

Model Library

In Studio select: GAMS>Model Library Explorer OR F6



GAMS & GAMS Studio, 2025© cgemod22

22



cgemod

Testing GAMS and GAMS Studio

Five programmes from the GAMS Model Library are used

1. transport (LP :objective value: 153.675) – already done

2. chenery (NLP: objective value: 1058.9)

3. bid (MIP: optimal solution: 15210109.512)

4. procel (MINLP: optimal solution: 1.9231)

5. scarfmcp (MCP: no objective function)

• Select each programme **in turn** from the model library.

• Each programme file will be the **Main File** in its own **Project**

– Main File marked by **GREEN** arrowhead

• Run each programme

– use GAMS>Run with Create GDX and Ref OR F10

• Check each returns an optimal solution

GAMS & GAMS Studio, 2025

© cgemod

23

23

cgemod

Workspace Directory

GAMS Studio - No active process

File Edit GAMS MIRO Tools Vie

Project Explorer

bid

chenery

procel

scarfmcp

transport

Name	Date modified	Type	Size
bid.gdx	28/10/2025 09:20	GAMS File	3 KB
bid.gms	28/10/2025 09:20	GAMS File	3 KB
bid.gsp	28/10/2025 09:20	GAMS Studio proj...	1 KB
bid.log	28/10/2025 09:20	Text Document	6 KB
bid.lst	28/10/2025 09:20	LST File	13 KB
bid.lxi	28/10/2025 09:20	LXI File	1 KB
bid.ref	28/10/2025 09:20	REF File	12 KB
chenery.gdx	28/10/2025 09:20	GAMS File	9 KB
chenery.gms	28/10/2025 09:20	GAMS File	8 KB
chenery.gsp	28/10/2025 09:20	GAMS Studio proj...	1 KB
chenery.log	28/10/2025 09:20	Text Document	4 KB
chenery.lst	28/10/2025 09:20	LST File	34 KB
chenery.lxi	28/10/2025 09:20	LXI File	1 KB
chenery.ref	28/10/2025 09:20	REF File	43 KB
procel.gdx	28/10/2025 09:21	GAMS File	3 KB
procel.gms	28/10/2025 09:21	GAMS File	4 KB
procel.gsp	28/10/2025 09:21	GAMS Studio proj...	1 KB
procel.log	28/10/2025 09:21	Text Document	24 KB
procel.lst	28/10/2025 09:21	LST File	19 KB
procel.lxi	28/10/2025 09:21	LXI File	1 KB
procel.ref	28/10/2025 09:21	REF File	11 KB
scarfmcp.gdx	28/10/2025 09:21	GAMS File	3 KB
scarfmcp.gms	28/10/2025 09:21	GAMS File	2 KB
scarfmcp.gsp	28/10/2025 09:21	GAMS Studio proj...	1 KB
scarfmcp.log	28/10/2025 09:21	Text Document	5 KB

For each model:

** .gdx

** .gms

** .gsp

** .log

** .lst

** .lxi

** .ref

GAMS & GAMS Studio, 2025

© cgemod

24

24

12

cgemod

cgemod

*An Introduction to GAMS with
GAMS Studio: Part 1*

The End



GAMS & GAMS Studio, 2025

© cgemod

25

