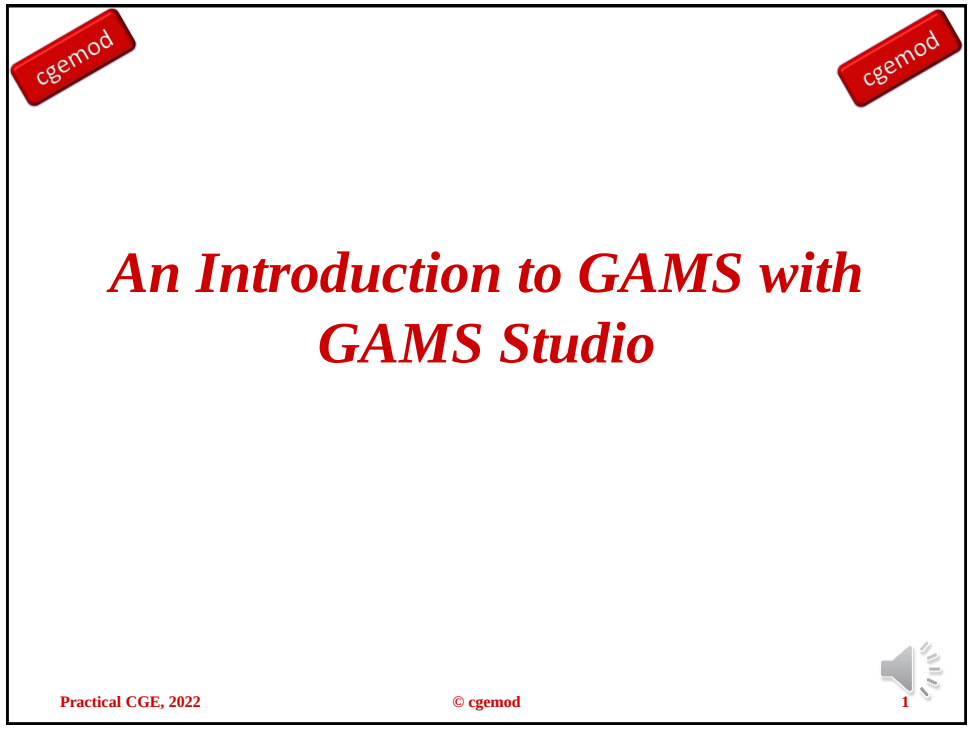
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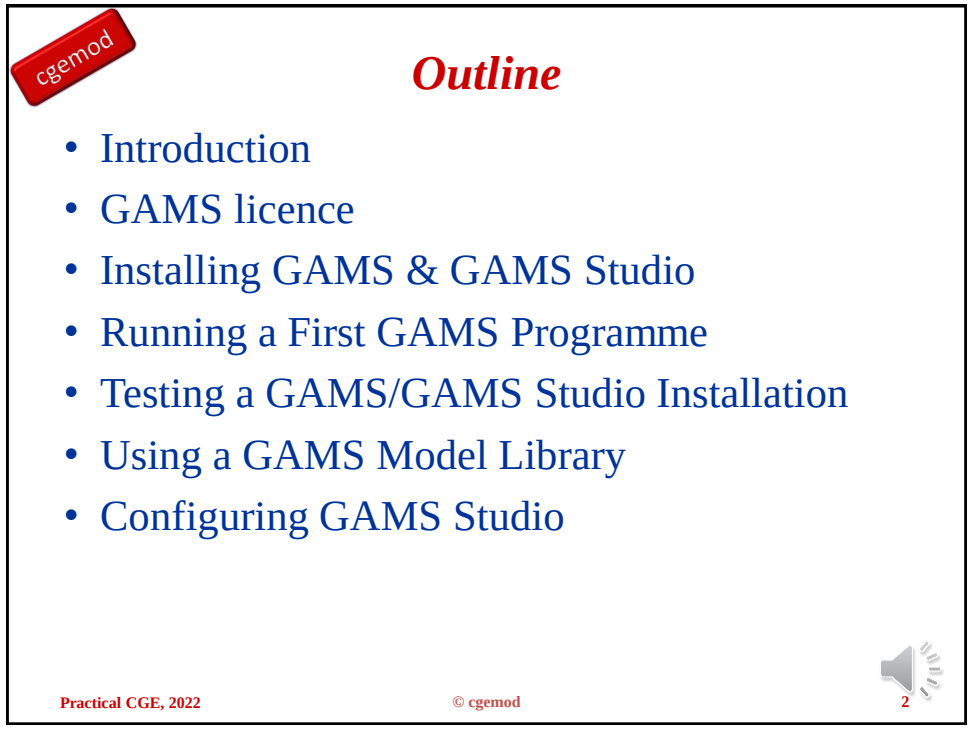
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Outline
• Introduction
• GAMS licence
• Installing GAMS & GAMS Studio
• Running a First GAMS Programme
• Testing a GAMS/GAMS Studio Installation
• Using a GAMS Model Library
• Configuring GAMS Studio
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Introduction

- 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 (or GAMSIDE)

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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).

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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

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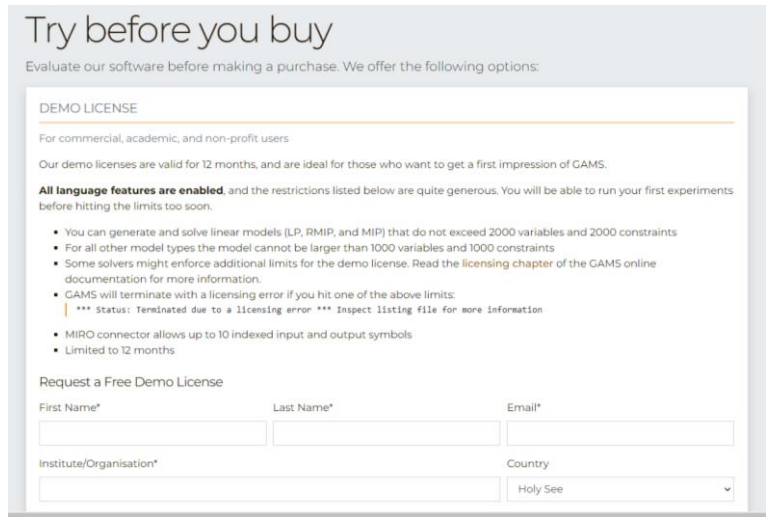
GAMS Demo Licence

Go to: https://www.gams.com/try_gams/



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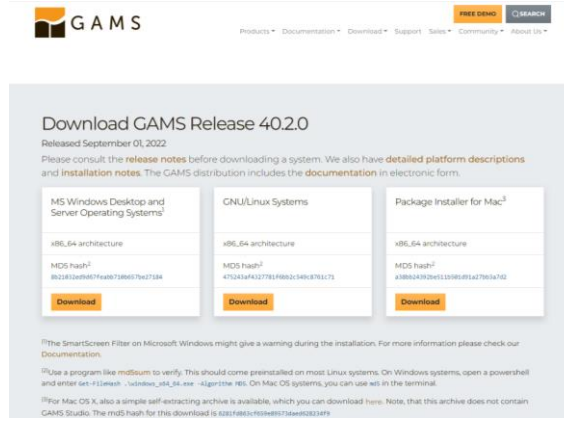
www.gams.com/download/



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

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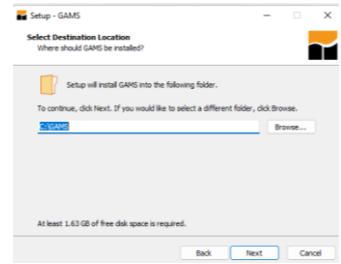
Installing GAMS

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



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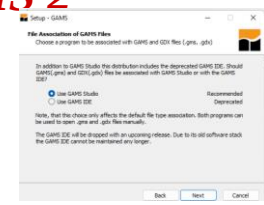
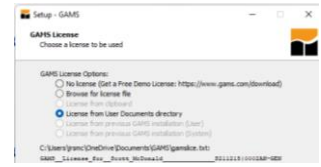
Installing GAMS 2

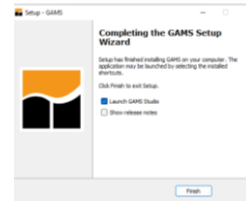
4. Select GAMS Studio as the editor



5. Select 'Browse for license file



6. Complete the GAMS Setup Wizard choose - 'Launch GAMS Studio'



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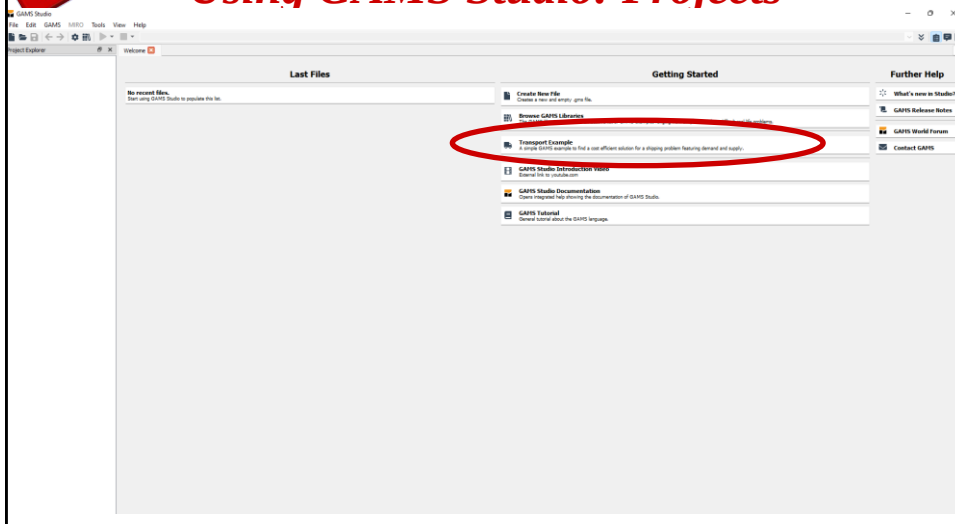
Using GAMS Studio: Projects



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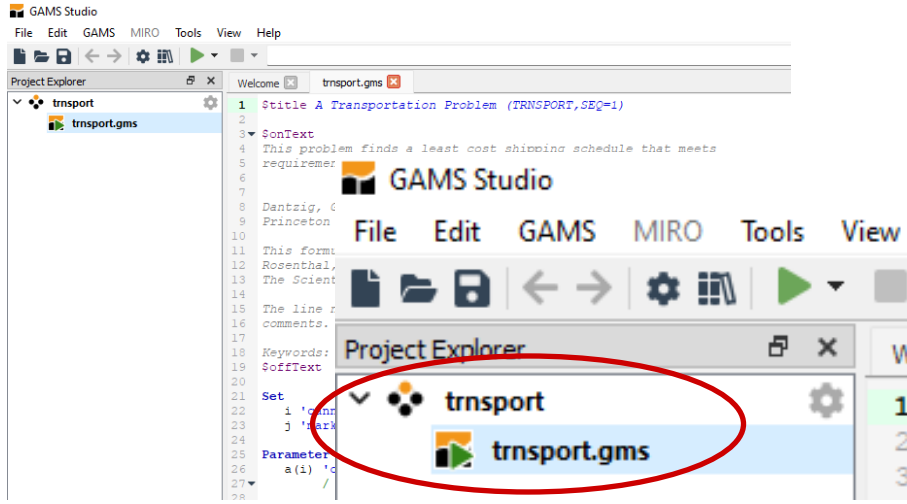
Using GAMS Studio: Projects



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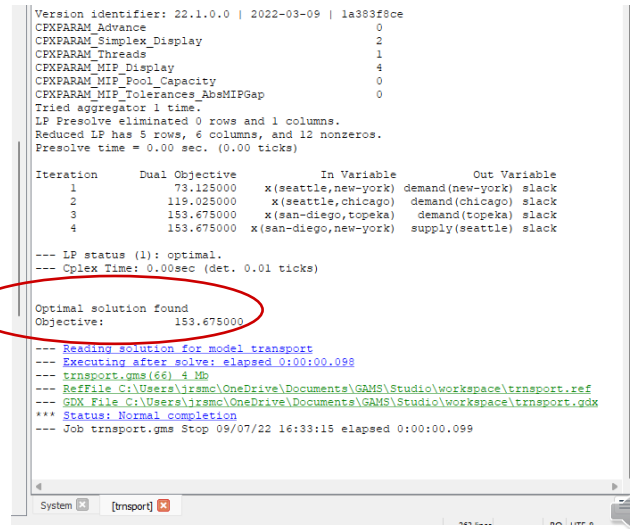
Testing GAMS and GAMS Studio

Run trnsport.gms: select GAMS>Run with GDX Creation OR F10



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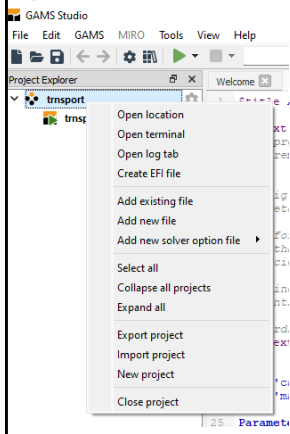
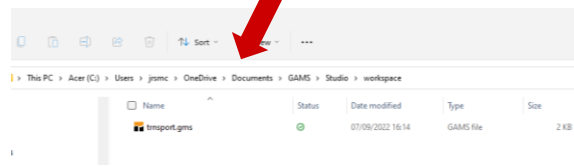
Test Directory



Right-click on the project label
Choose 'Open Location'

Location path



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Testing GAMS and GAMS Studio

Six programmes from the GAMS Model Library used

1. `trnsport` (LP :objective value: 153.675)
2. `chenery` (NLP: objective value: 1058.9)
3. `bid` (MIP: optimal solution: 15210109.512)
4. `procsel` (MINLP: optimal solution: 1.9231)
5. `scarfmcp` (MCP: no objective function)

- Select each programme in turn from the model library.
- In turn set each programme the main file
  - Right click on the respective gms file and select **Set as main file**
- Run each programme
  - use GAMS>Run with GDX Creation OR F10
- Check each returns an optimal solution

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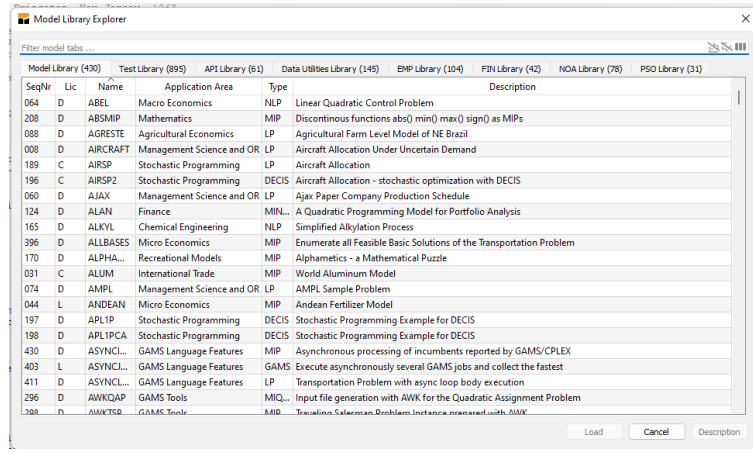
Model Library

In Studio select: `GAMS>Model Library Explorer` **OR** `F6`



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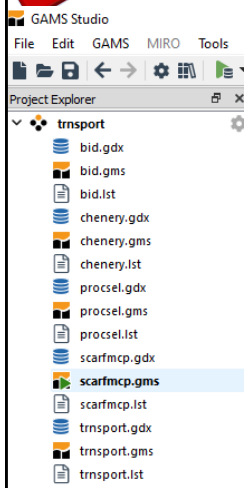
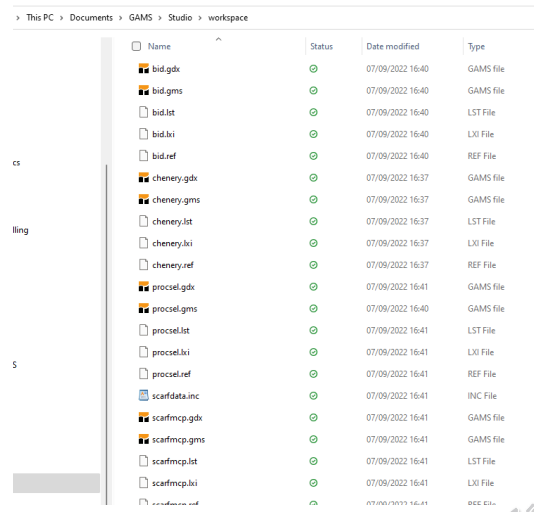
Workspace Directory





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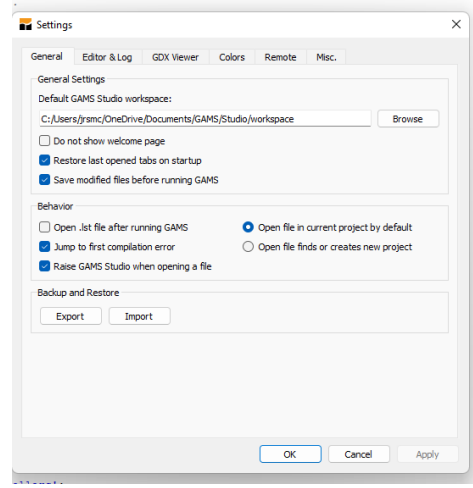
Configuring GAMS Studio

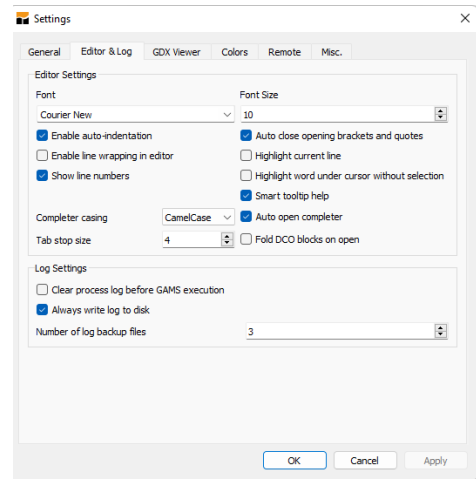
1. Choose File>settings OR F7
   - Opens the settings
2. Choose General tab
3. NB the path for the Default GAMS Studio Workspace
4. Leave the defaults settings
   - Check that 'Open file in current project by default' is selected
5. Some on these settings may change later

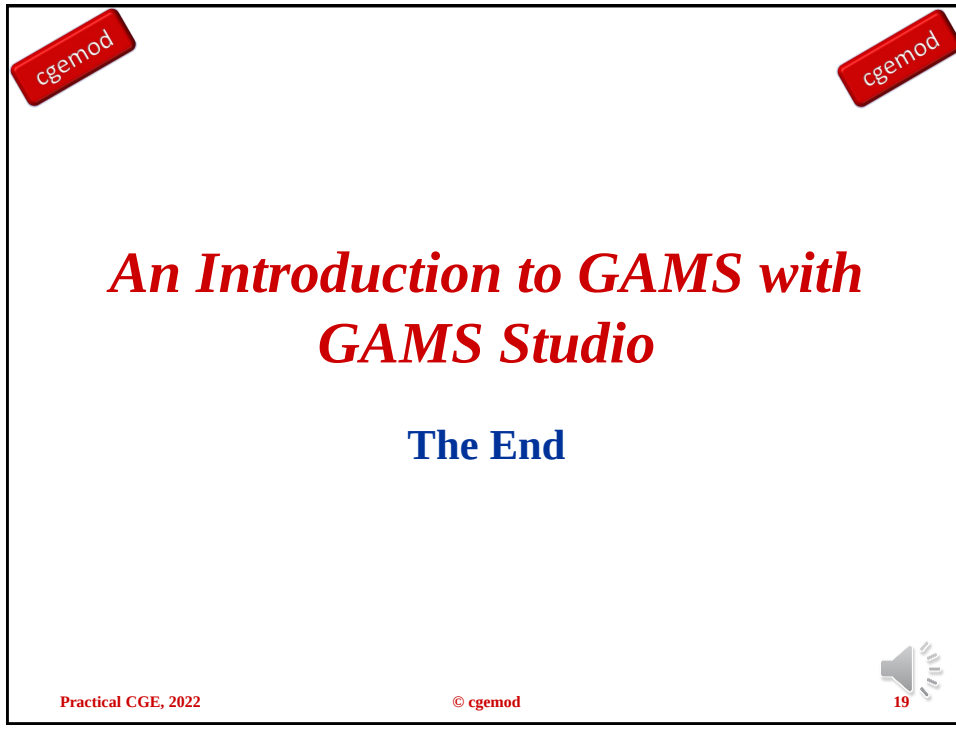


Configuring GAMS Studio

1. Choose Editor & Log tab
2. Set font to Courier New
3. Set the font size
4. Leave the other settings for now

- Some on these settings may change later

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