

# Toy Model User Guide

You are asked to carry out three exercises on some simple interactive models, which we call ‘Toy Models’. The exercises will take approx 1 hour in total.

The Toy Models are designed in order to a) *first* understand b) *then* train and c) *finally* test your ability to manage stocks & flows. Their basic structure is described in the Figure below: One flow (Inflow 1) adds material to a stock (Resource 1); another flow (Inflow 2) removes material from Resource 1 and adds it to another stock (Resource 2); finally a last flow (Outflow) removes material from Resource 2

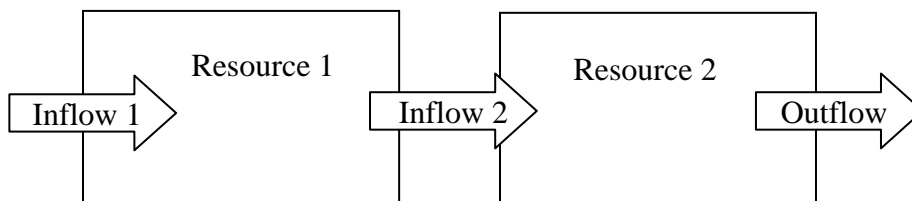


Figure 1: Basic System dynamics of the Toy Model

**Before starting the exercises**, you will be given a group presentation of the Toy Models interface; during the presentation you will interact with the software in order to familiarise with the interface and the model features. This session will last approx 10 minutes. If you encounter any problem with the interface or if any model feature is not clear to you, please ask the facilitators during or after the presentation. It is important that you understand how to interact with the Toy Models before starting the exercises.

**You launch any of the Toy Models** by clicking on the icon the facilitators will show you; once the Toy Model appears on the screen and before you can start using it, you need to:

- 1) Fill in by your *identification number* in the green box on the top left. This is needed for data processing, however your performance will remain anonymous.
- 2) Choose which Toy Model you want to use and
- 3) Click on Setup (grey button below the Identification number box) in order to initialise the run.

**To use any of the Toy Models**, you need to

- 4) Choose the value of the inflows. You can do so by using the two green horizontal sliders called Inflow\_1 and Inflow\_2.
- 5) Once you are happy with the values of the inflows, click Go (large grey button at the right hand side of the Setup button); this will execute one time step of the system dynamics.
- 6) Check the performance of the system by comparing the evolution of the resources vs the target resource dynamics in the two plots called Dynamics\_of\_Resource\_1 and Dynamics\_of\_Resource\_2.
- 7) Go back to point 4 and proceed.
- 8) After a fixed number of time steps a window will appear. If you have managed the stocks & flows well, that is if the resources match the target resources closely, you will be instructed to proceed to the next exercise. Otherwise, you will be asked to repeat the exercise.

Below you can find further information on each individual Toy Model.

**Toy Model 1:** In the first Toy Model you do not need to worry about the dynamics of Resource 1, since you need to manage only Resource 2. You can do so by regulating Inflow 2 in order to ensure that Resource 2 matches 'Target Resource 2'. Pay attention to Outflow, that is how much is removed from Resource 2.

The current value of Resource 2 and the value of 'Target Resource 2' at the next time step are shown in the windows below the Inflow\_2 slider. The value of 'Target Resource 2' you see in the window is what you aim Resource 2 to match at the next time step. Additionally, the plot Dynamics\_of\_Resource\_2 will show the time series of past values of both Resource 2 matches 'Target Resource 2' for you to have some feedback on how well you are doing.

Throughout the run the outflow is constant and its value is displayed in the window next to the Outflow plot. Pay attention that there is a threshold on Resource 2 (its value is 20). If you pass the threshold the run will stop and you will have to re-start.

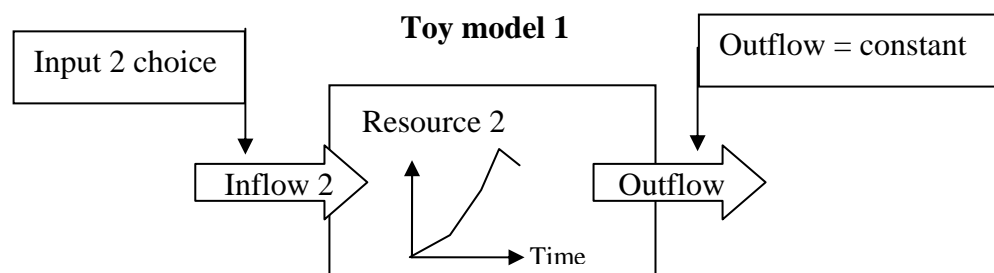


Figure 2: Toy Model 1

**Toy Model 2:** In the second Toy Model you need to manage both resource 1 and Resource 2. You can do so by regulating both Inflow 1 and Inflow 2 in order to ensure that Resource 1 matches 'Target Resource 1' and Resource 2 matches 'Target Resource 2'. Remember to pay attention to Outflow, that is how much is removed from Resource 2.

As before, the current value of Resource 2 and the value of 'Target Resource 2' at the next time step are shown in the windows below the Inflow\_2 slider; this time you will also need to pay attention to the value of Resource 1 and the value of 'Target Resource 1' below the Inflow\_1 slider.

Also as before, the value of 'Target Resource 2' you see in the window is what you aim Resource 2 to match at the next time step and the same applies to Resource 1 and 'Target Resource 1'. Additionally, you can use the plots Dynamics\_of\_Resource\_1 and Dynamics\_of\_Resource\_2 to have some feedback on how well you are doing.

Throughout the run the outflow is constant and its value is displayed in the window next to the Outflow plot. Pay attention that there is a threshold on Resource 2 (20) and in Resource 1 (15). If you pass the threshold of Resource 2 the run will stop and you will have to re-start. If you pass the threshold of Resource 1 you will receive a warning.

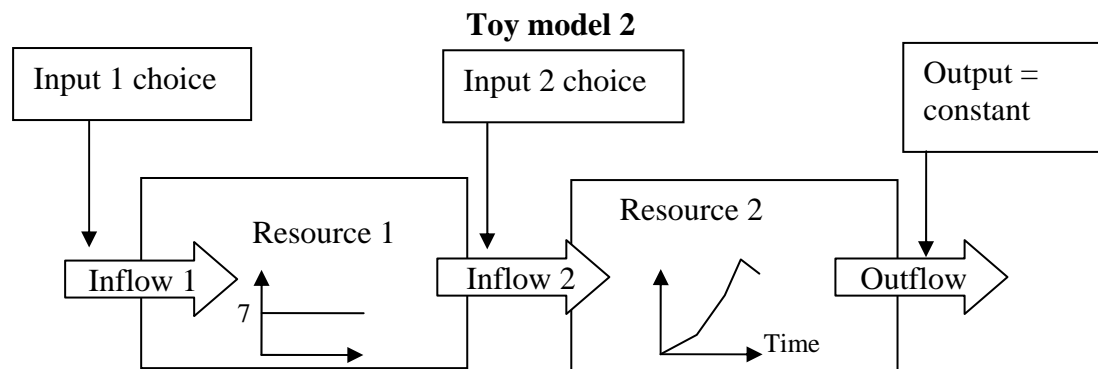


Figure 3: Toy Model 2

**Toy Model 3:** The third Toy Model works like the second one, but now Outflow varies depending on Resource 2. This feedback between Resource 2 and Outflow provides an additional challenge since in order to manage your resources now you need to guess the evolution of Outflow and regulate the inflows accordingly.

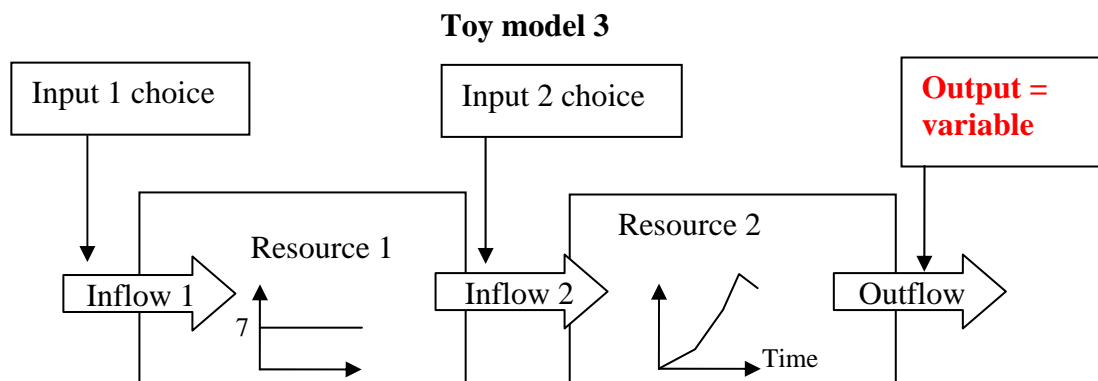


Figure 4: Toy Model 3