**Dataset Classes**

* Datasets are of equal length
* Data reported every dt (0.25)
* In vensim, we use standart data export option.
* In Stella, we create two output tables one with 2 digits, one as free float. Then simply transfer the data to excel with copy and paste

BASIC\_1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Batch | Model | Vensim | Stella 2 decimal | Stella Free Float |
| CONST | ../patterns/const.png | Basic\_1 | - |  | - |  |
| LNRGR | ../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patterns/plinr.p | Basic\_1 | GM01\_LNR | OK | OK | OK |
| PEXGR  (GR3) | ../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patterns/pexgr.p | Basic\_1 | GM02\_EXP | OK | OK | OK |
| NEXGR  (GR1) | ../../../../../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patt | Basic\_1 | GM02\_EXP | OK | OK | OK |
| SSHGR  (GR2) | ../patterns/sshgr.png | Basic\_1 | GM03\_SSH | OK | OK | OK |
| GR1D3 | ../patterns/g1ped.png | Basic\_1 |  | OK | OK | OK |
| GR2D3 | ../patterns/g2ped.png | Basic\_1 |  | OK | OK | OK |
| GR1D2 | ../patterns/gr1da.png | Basic\_1 |  | OK | OK | OK |
| GR2D2 | ../patterns/gr2da.png | Basic\_1 |  |  | OK | OK |

BASIC\_2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Batch | Model | Vensim | Stella 2 decimal | Stella Free Float |
| CONST | ../patterns/const.png | Basic\_1 | - |  | - |  |
| LNRGR | ../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patterns/plinr.p | Basic\_1 | GM01\_LNR | OK | OK | OK |
| LNRDC | ../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patterns/nlinr.p | Basic\_2 | GM01\_LNR | OK | OK | OK |
| PEXGR  (GR3) | ../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patterns/pexgr.p | Basic\_1 | GM02\_EXP | OK | OK | OK |
| PEXDC  (D3) | ../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patterns/pexdc.p | Basic\_2 | GM02\_EXP | OK | OK | OK |
| NEXGR  (GR1) | ../../../../../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patt | Basic\_1 | GM02\_EXP | OK | OK | OK |
| NEXDC  (D1) | ../../../../../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patt | Basic\_2 | GM02\_EXP | OK | OK | OK |
| SSHGR  (GR2) | ../patterns/sshgr.png | Basic\_1 | GM03\_SSH | OK | OK | OK |
| SSHDC  (D2) | ../patterns/sshdc.png | Basic\_2 | GM03\_SSH | OK | OK | OK |
| GR1D3 | ../patterns/g1ped.png | Basic\_1 |  | OK | OK | OK |
| GR2D3 | ../patterns/g2ped.png | Basic\_1 |  | OK | OK | OK |
| GR1D2 | ../patterns/gr1da.png | Basic\_1 |  | OK | OK | OK |
| GR1D2 | ../patterns/gr1db.png |  |  |  |  |  |
| GR2D2 | ../patterns/gr2da.png | Basic\_1 |  |  | OK | OK |
| GR2D2 | ../patterns/gr2db.png |  |  |  |  |  |
| D1GR2 | ../patterns/d1gra.png | Basic\_2 |  |  |  |  |
| D1GR2 | ../patterns/d1grb.png |  |  |  |  |  |
| D1GR3 | ../patterns/d1peg.png | Basic\_2 |  |  |  |  |
| D2GR2 | ../patterns/d2gra.png | Basic\_2 |  |  |  |  |
| D2GR2 | ../patterns/d2grb.png |  |  |  |  |  |
| D2GR3 | ../patterns/d2peg.png | Basic\_2 |  |  |  |  |
|  |  |  |  |  |  |  |
| OSC | ../patterns/oscct.png |  |  |  |  |  |
|  | ../patterns/oscdc.png |  |  |  |  |  |
|  | ../patterns/oscgr.png |  |  |  |  |  |
| OSC Dampen |  |  |  |  |  |  |
| OSC Widen |  |  |  |  |  |  |
|  | ../../../../../Desktop/patterns/d1peg.pn |  |  |  |  |  |
|  | ../../../../../Desktop/patterns/const.pn |  |  |  |  |  |
|  | ../../../../../Desktop/patterns/zero0.pn |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **1** | **2** | **3** |
| **Growths** | ../../../../../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patt | ../patterns/sshgr.png | ../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patterns/pexgr.p |
| **Declines** | ../../../../../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patt | ../patterns/sshdc.png | ../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patterns/pexdc.p |

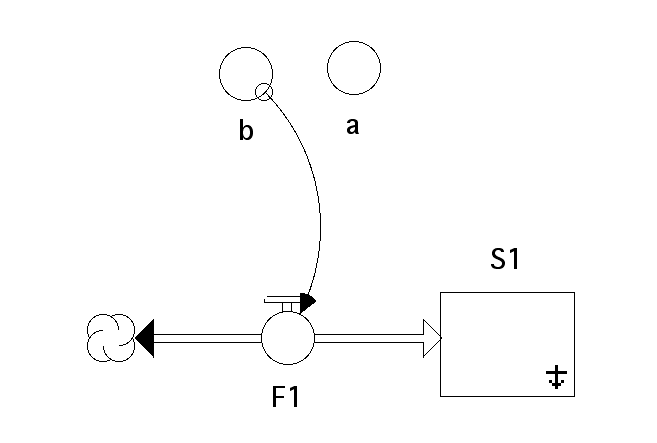
**Since G3 cannot be immediatelly followed by a decline phase due to continuity, we skip GR2XX type of behaviors.**

1. **LNRGR:** Linear growth
   1. Generated using the GM01\_LNR structure
   2. Intercept a: U[-1000, 1000]
   3. Slope b: U[0, 100]
   4. 100 instances with multivariate option
2. **LNRDC:**
   1. Generated using the GM01\_LNR structure
   2. Intercept a: U[-1000, 1000]
   3. Slope b: U[0, 100]
   4. 100 instances with multivariate option
3. **PEXGR:** Positive exponential growth
   1. Generated using the GM02\_EXP structure
   2. Reference level a: U[-1000, 1000]
   3. Growth factor b: U[0, 0.25]
   4. Initial distance to the reference level c: U[0, 1000]
   5. 100 instances with multivariate option
4. **NEXGR:** Negative exponential growth
   1. Generated using the GM02\_EXP structure
   2. Reference level a: U[-1000, 1000]
   3. Growth factor b: U[-0.25, 0]
   4. Initial distance to the reference level c: U[-1000, 0]
   5. 100 instances with multivariate option
5. **PEXDC:** Positive exponential decline
   1. Generated using the GM02\_EXP structure
   2. Reference level a: U[-1000, 1000]
   3. Growth factor b: U[0, 0.25]
   4. Initial distance to the reference level c: U[-1000, 0]
   5. 100 instances with multivariate option
6. **NEXDC:** Negative exponential decline
   1. Generated using the GM02\_EXP structure
   2. Reference level a: U[-1000, 1000]
   3. Growth factor b: U[-0.25, 0]
   4. Initial distance to the reference level c: U[0, 1000]
   5. 100 instances with multivariate option
7. **SSHGR:** S-shaped growth
   1. Generated using the GM03\_SSH structure
   2. 1st Reference level a1: U[-1000, 1000]
   3. Gap between reference levels (delta = a2-a1): U[0, 1000]
   4. Initial distance to the first reference level c: U[0, delta/4]
   5. Growth factor b: U[0, 1/(4\*delta)]
   6. 100 instances with multivariate option
8. **SSHDC:** S-shaped decline
   1. Generated using the GM03\_SSH structure
   2. 1st Reference level a1: U[-1000, 1000]
   3. Gap between reference levels (delta = a2-a1): U[-1000, 0]
   4. Initial distance to the first reference level c: U[0, delta/4]
   5. Growth factor b: U[0, 1/(4\*delta)]
   6. 100 instances with multivariate option

**Generator Models**

1. GM01\_LNR: Linear change (growth and decline)
   * 1. Intercept a: U[-1000, 1000]
     2. Slope b: U[0, 100]





|  |  |
| --- | --- |
| ../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patterns/plinr.p | ../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patterns/nlinr.p |

1. GM02\_EXP
   * 1. Reference level a
     2. Growth factor b
     3. Initial distance to the reference level c



S1\_INIT = a + c

dS1/dt = (S1-a).b

|  |  |  |  |
| --- | --- | --- | --- |
| ../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patterns/pexgr.p | ../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patterns/pexdc.p | ../../../../../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patt | ../../../../../../Documents/Research%20Topics/Behaviour%20Analysis/Publications/SD%20Handbook/Round%206%20(Final)/fig2/patt |

1. GM03\_SSH:
   * 1. 1st Reference level (a1): Represents the initial take-off level of S1
     2. 2nd Reference level (a2) – defined as a1 + gap : Represents the final convergence level of S1
     3. Growth factor (b): Defines the speed of closing the gap to a2
     4. Initial distance to the first reference level c:



S1\_Init = a1 + c

a2 = a1 + delta

F1 = (a2-S1)(S1-a1)b