SubPrograms: “User Commands” in FlexSim

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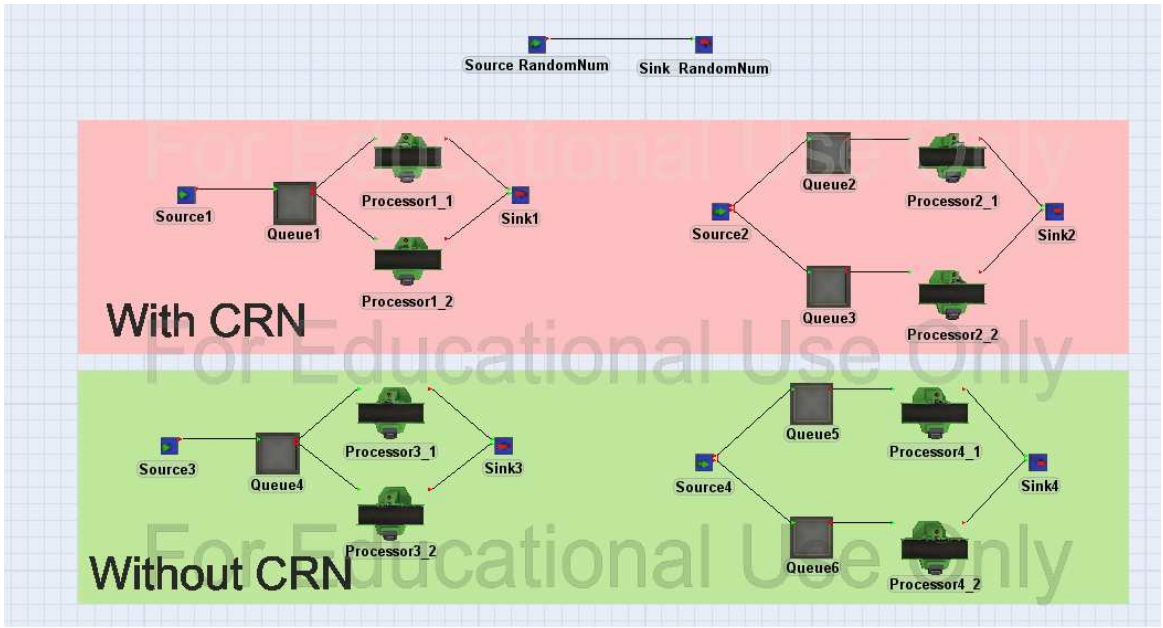
Motivation of Using Subprograms



- Q: How can we avoid repeating the same statements in coding. For example: We need to generate "Weibull data via inverse cdf" in all "Sources" and "Processors" many times. Also, we need to do "computation" in "Sink" many times.
- A: Via the idea of "Subprograms".

Main Program vs. Subprograms

Main Program (主程序)

Call

- Subprogram 1 (子程序 1)
- Subprogram 2 (子程序 2)

Subprogram 1

Ex. Subroutine 1:

“InverseWeibull”

Subprogram 2

Ex. Subroutine 2:

“Computation”

- Subprograms helps to build a better structure (結構) of a main program

Subprograms in FlexSim

Subprograms in "User Commands"

- Goal: Construct subprograms in FlexSim
- FlexSim: Tools → User Commands → Add
- Name: eg. InverseWeibull
- Parameters: (num a, num b, num u),
- Return Type: num
- Description: For user's reference

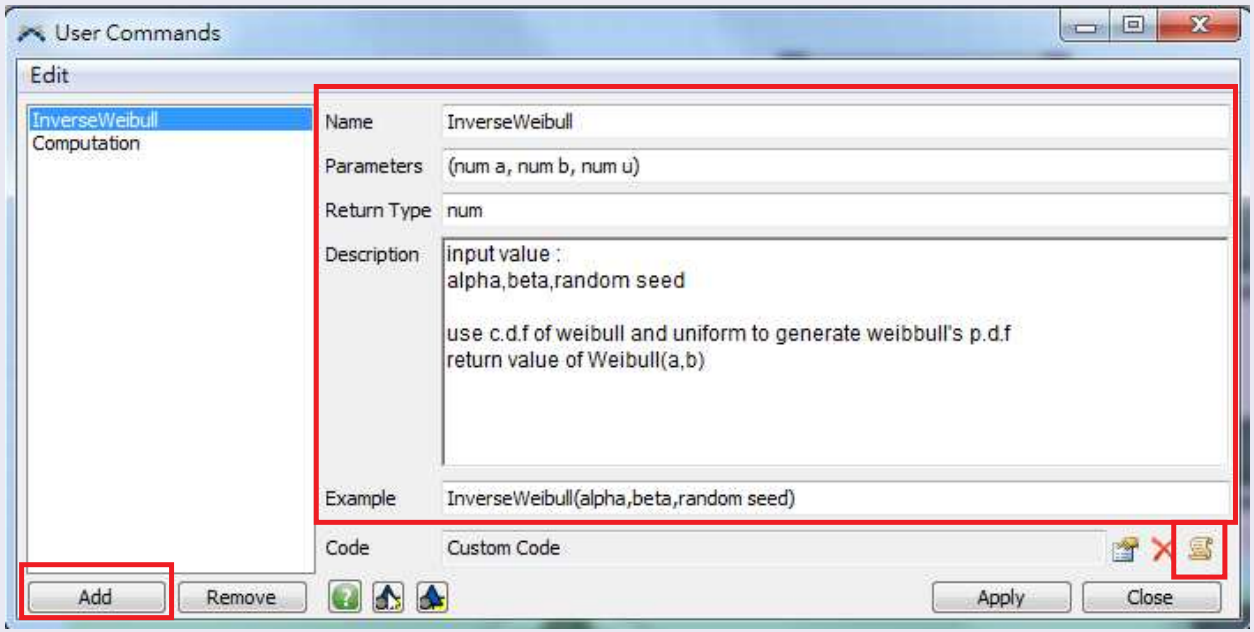
Return Type:

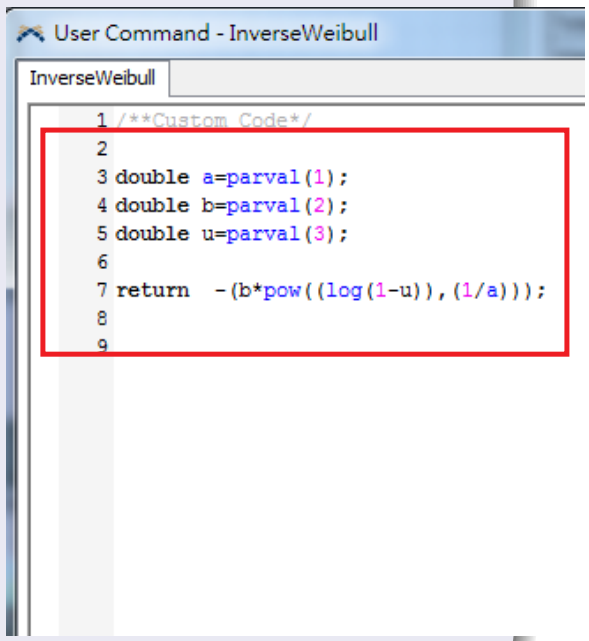
- "num" (for integer or double)
- "str" (for stream)
- "node" (for treenode)

“Subprogram” in FlexSim

- Tools → User Commands → Add
- Name: InverseWeibull
  Parameters: (num a, num b, num u), Return Type: num

Subprogram in FlexSim: InverseWeibull





Inter-Arrivaltime of Source

- Source1 → Source → Inter-Arrivaltime

/Source1 - Inter-Arrival Time

Source1 - Inter-Arrival Time

```
1 /**Custom Code*/
2 treenode current = ownerobject(c);
3
4 double a = SourceA;
5 double b = SourceB;
6 double c = gettablenum("RandomNumber",getoutput(current)+1,1);
7
8 return InverseWeibull(a,b,c);
```

Global Table - RandomNumber

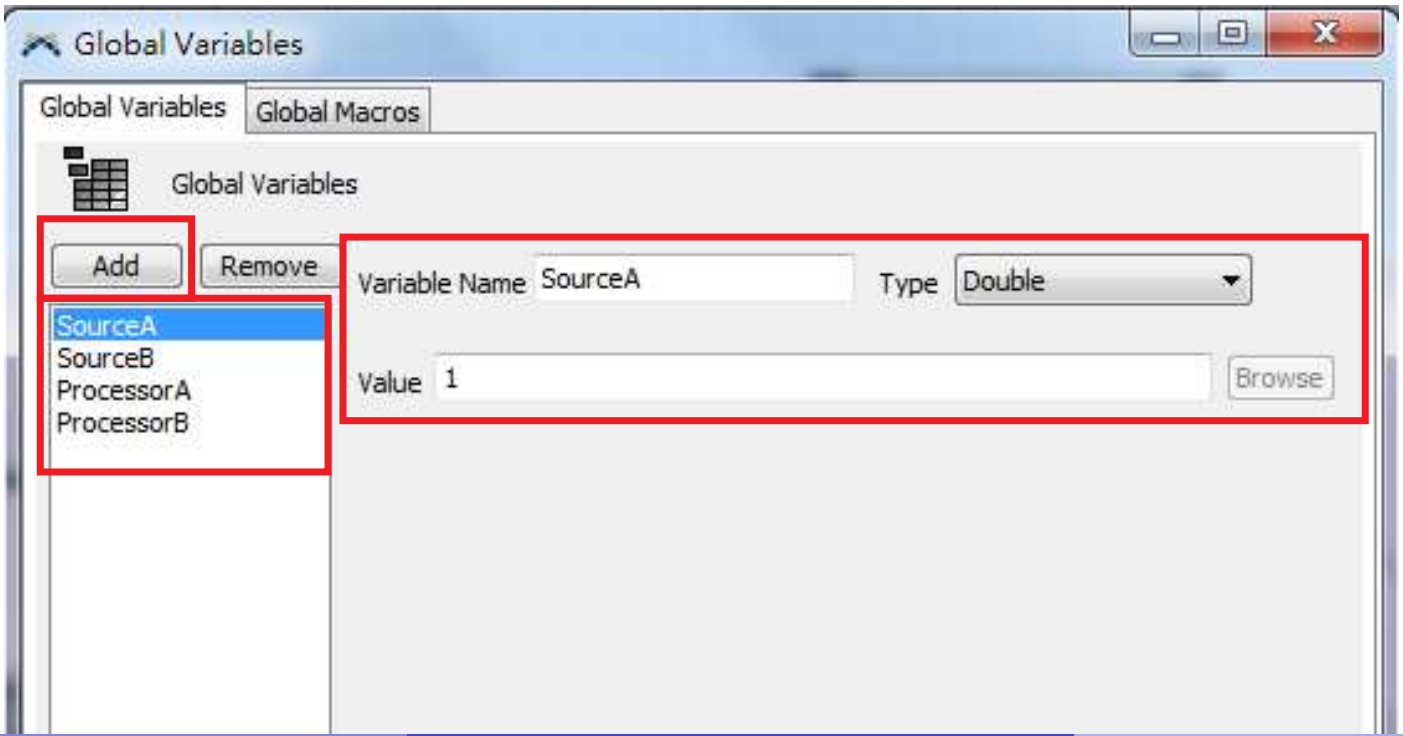
Name: RandomNumber

	Random_Source	Random_P
	0.42	
Row 2	0.45	
Row 3	0.67	
Row 4	0.24	
Row 5	0.76	
Row 6	0.42	
Row 7	0.23	
Row 8	0.25	

- Note: We use “Global Variables” in FlexSim to define value globally (see next page)

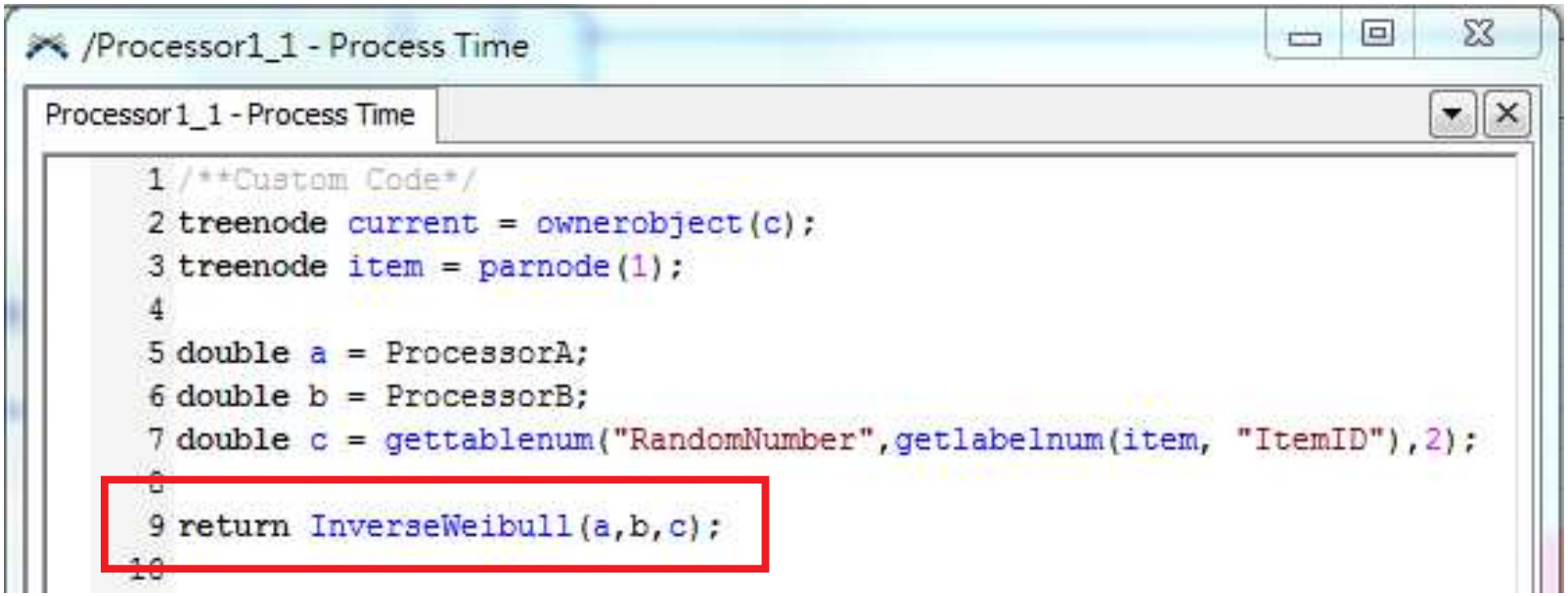
Global Variables

- Tools → Global Variables → Add
  - Variable Name: SourceA , Type: Double , Value=1
  - Variable Name: SourceB , Type: Double , Value=2
  - Variable Name: ProcessorA , Type: Double , Value=1
  - Variable Name: ProcessorB , Type: Double , Value=1



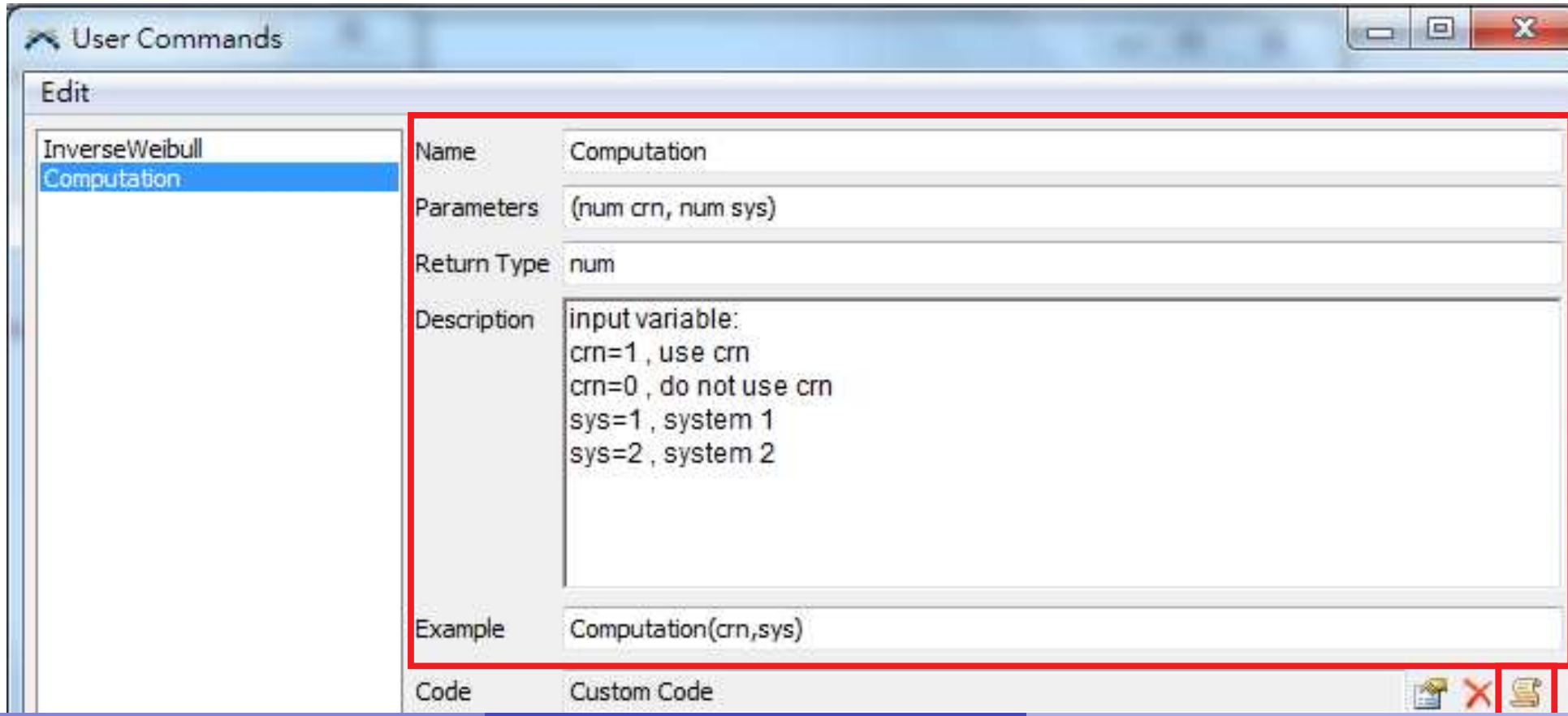
Process Time of Processor

- Processor1_1 → Processor → Process Time



User Commands: Computation

- Tools → User Commands → Add
- Name: Computation , Parameters: (num crn, num sys), Return Type: num



Computation (crn, sys)

User Command - Computation

Computation

```
1  /**Custom Code*/
2  int crn=parval(1);
3  int sys=parval(2);
4  double Sum=0;
5  double SumW=0;
6  double SumWQ1=0;
7  double SumWQ2=0;
8  string WQt;
9  int EnterCol;
10 int LeaveCol;
11 int WqCol;
12
13 if(crn==1)
14 {
15     WQt="WQtableCRN";
16 }
17 else
18 {
19     crn=2;
20     WQt="WQtable";
```

```
34
35     settablenum("IndexCheck",crn,1,gettablenum("IndexCheck",
36     //calculate WQ
37     for(int k=1 ;k<=gettablenum("InitialValues",1,1)+gettabl
38     {
39         settablenum(WQt,k,WqCol,gettablenum(WQt,k,LeaveCol)-
40     }
41     //calculate average WQ
42     for(int k=gettablenum("InitialValues",2,1)+1 ;k<=gettabl
43     {
44         SumWQ1 = SumWQ1 + gettablenum(WQt,k,WqCol);
45     }
46     settablenum("WQ",crn,sys,SumWQ1/gettablenum("InitialValu
47     for(int k=gettablenum("InitialValues",3,1)+1 ;k<=gettabl
48     {
49         SumWQ2 = SumWQ2 + gettablenum(WQt,k,WqCol);
50     }
51     settablenum("WQ",crn,sys+2,SumWQ2/gettablenum("InitialVa
52
53     if(gettablenum("IndexCheck",crn,1)==2)
54     {
55         //calculate differ
56         for(int k=1 ;k<=gettablenum("InitialValues",1,1)+get
```

Computation (crn, sys) - With CRN

/Sink1 - OnEntry

Sink1 - OnEntry

```
1 /**Custom Code*/
2 treenode item = parnode(1);
3 treenode current = ownerobject(c);
4 int port = parval(2);
5
6 if (getinput(current) == gettablenum("InitialValues",1,1)+gettablenum("InitialValues",3,1))
7 {
8     Computation(1,1);
9 }
```

/Sink2 - OnEntry

Sink2 - OnEntry

```
1 /**Custom Code*/
2 treenode item = parnode(1);
3 treenode current = ownerobject(c);
4 int port = parval(2);
5 if (getinput(current) == gettablenum("InitialValues",1,1)+gettablenum("InitialValues",3,1))
6 {
7     Computation(1,2);
8 }
```

Computation (crn, sys) - Without CRN

/Sink3 - OnEntry

Sink3 - OnEntry

```
1 /**Custom Code*/
2 treenode item = parnode(1);
3 treenode current = ownerobject(c);
4 int port = parval(2);
5
6 if (getinput(current) == gettablenum("InitialValues",1,1)+gettablenum("InitialValues",3,1))
7 {
8     Computation(0,1);
9 }
```

/Sink4 - OnEntry

Sink4 - OnEntry

```
1 /**Custom Code*/
2 treenode item = parnode(1);
3 treenode current = ownerobject(c);
4 int port = parval(2);
5
6 if (getinput(current) == gettablenum("InitialValues",1,1)+gettablenum("InitialValues",3,1))
7 {
8     Computation(0,2);
9 }
```