Check “Flexsim: by probability”

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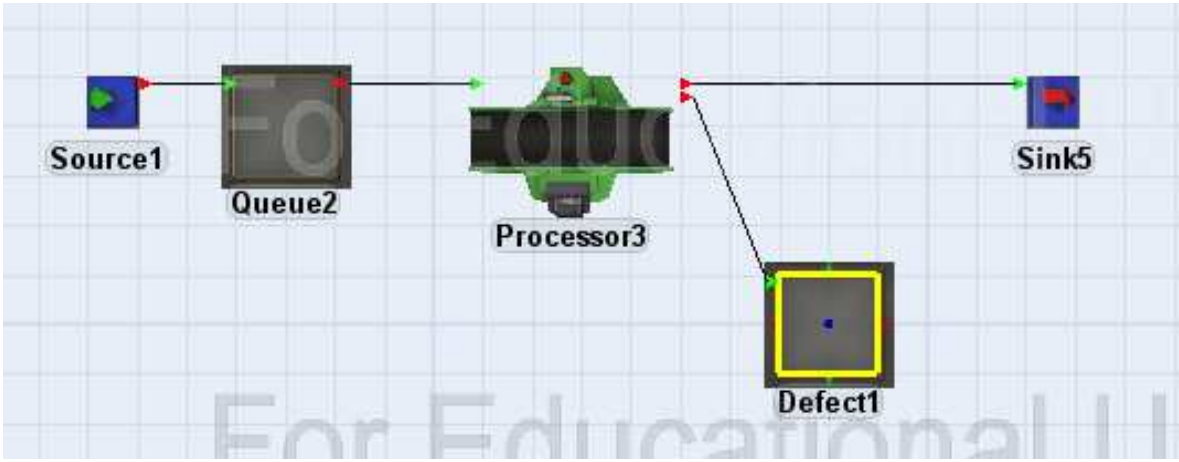
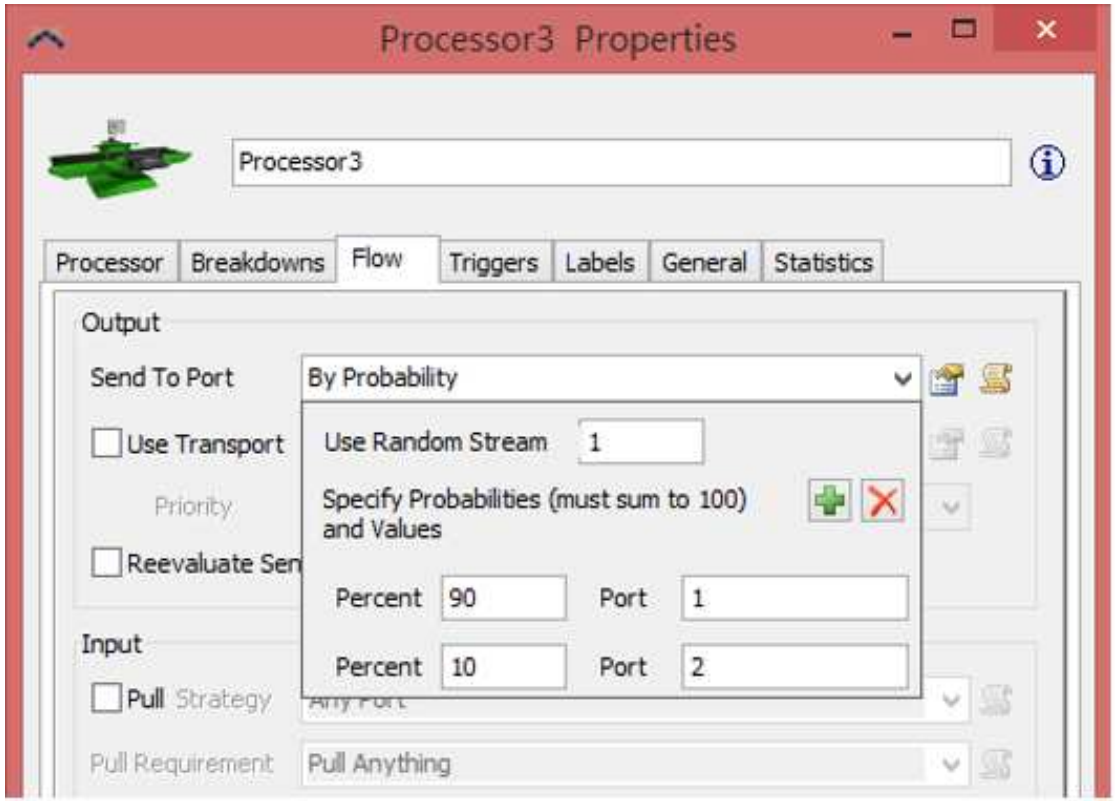
Flexsim: Default “By probability”

- 在 Flow 中 Send to port, 選取 By probability 可以用來設定 item 在出此站後有多少比例前往哪個 output port
- input=200,Processor 的良率為 90%, 表示有 90% 之 item(良品) 會進入 sink,10%(不良品) 會進入 defect
- 流程為下圖:



Flexsim: Default “By probability” - Conti.



Code in “By probability”

- Do you see anything wrong?

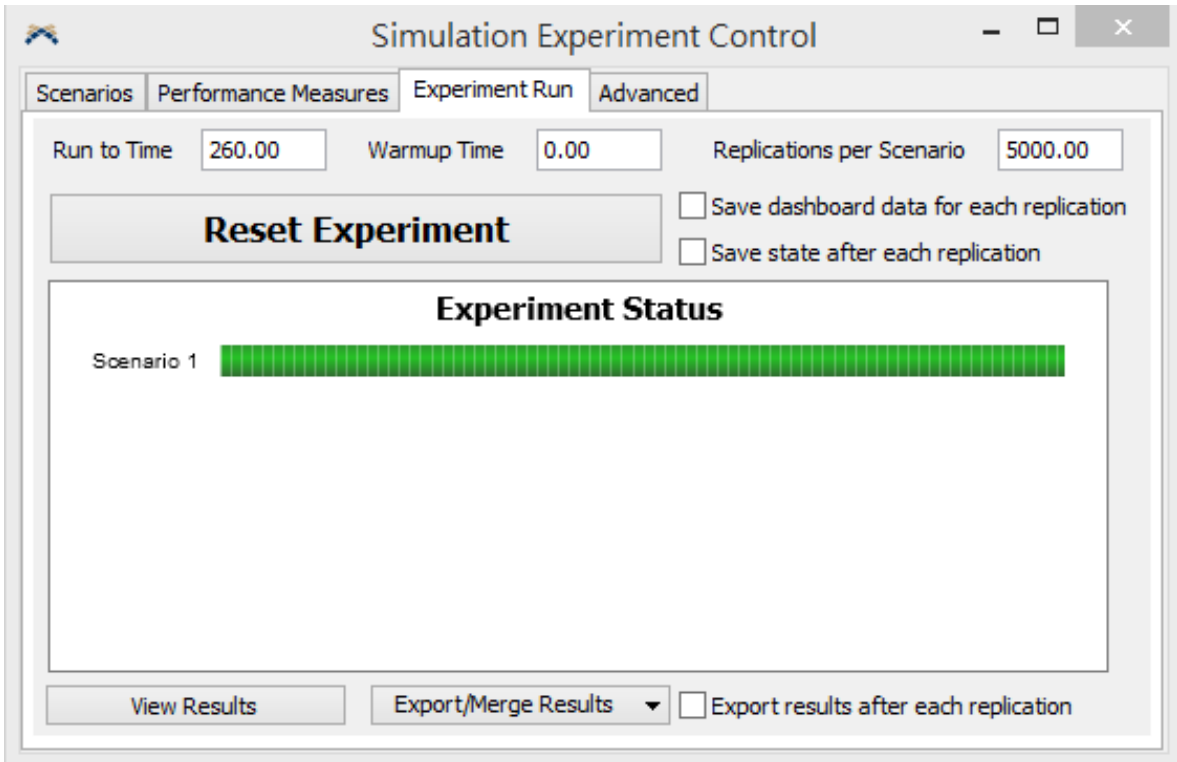
/Processor3 - Send To Port

Processor3 - Send To Port

```
1  treenode item = parnode(1);
2  treenode current = ownerobject(c);
3  /***popup:Probability:valuestr=Port*/
4  /**By Probability*/
5  /**\nStream number: */
6  int stream = /***tag:stream*//**/1/**/;
7  treenode data = node(">tags/data", current);
8  int size = content(data);
9  int randomnum = trunc(uniform(0.0, 100.0, stream));
10 double total = 0.0;
11 /***tagex:data*/
12 total += /**\nPercent: *//**/90/**/;
13 if (randomnum <= total)
14     return /** Port: *//**/1/**/;
15 total += /**\nPercent: *//**/10/**/;
16 if (randomnum <= total)
17     return /** Port: *//**/2/**/;/***/
18
```

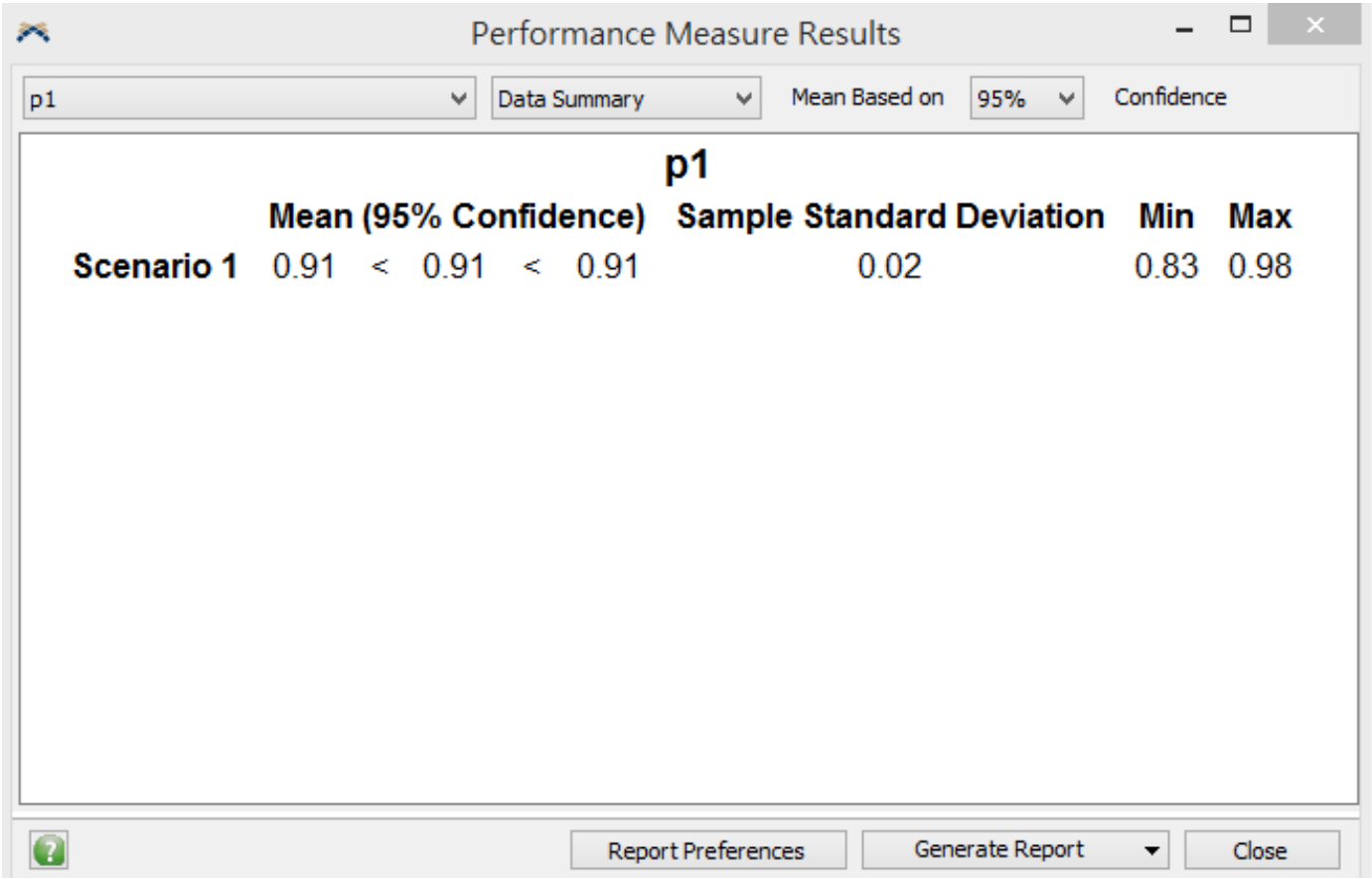
Simulation Experimenter

- Replicate 5000 times
- Performance measure: p1 in Global Table



Results: C.I

- Result is 0.91 which differs from the ideal value: 0.9



Edited Version

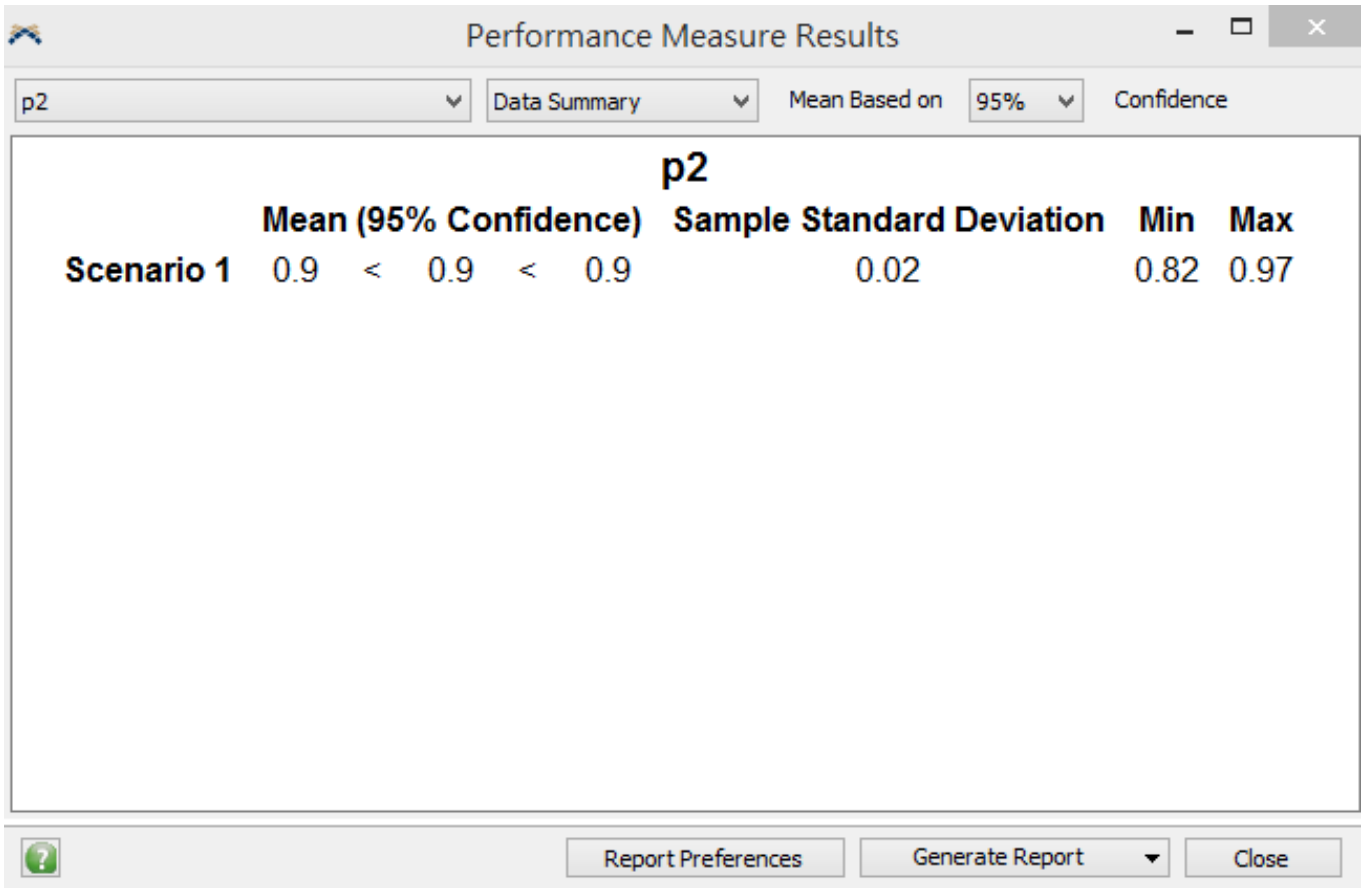
/Processor9 - Send To Port

Processor9 - Send To Port

```
1 /**Custom Code*/
2 treenode item = parnode(1);
3 treenode current = ownerobject(c);
4
5 int stream = 1;
6 int randomnum = duniform(1, 100, stream);
7 double total = 0.0;
8
9 total += 90;
10 if (randomnum <= total)
11     return 1;
12 total += 10;
13 if (randomnum <= total)
14     return 2;
15
```

Results for the Edited Version

- C.I. match the ideal value: 0.9



Comparison

Default "By Probability"

```
int stream =1;
int randomnum = trunc(uniform(0.0, 100.0, stream));

double total = 0.0;
total +=90;
if (randomnum <= total)
    return 1;

total += 10;
if (randomnum <= total)
    return 2;
```

Edited Version "Custom Code"

```
int stream =1;
int randomnum = duniform(1, 100, stream));

double total = 0.0;
total +=90;
if (randomnum <= total)
    return 1;

total += 10;
if (randomnum <= total)
    return 2;
```

Discussion

- Expected Mean Rate: 90%
- There is a bug in the default "By Probability"

FlexSim Default (Error)

- sample mean rate: 0.911656
- se(sample mean rate): 0.00286
- Output (Leading Digit Rule, LDR):
  sample mean rate: 0.912
  (Not Ok, since it should be 0.9)

Correct Version

- sample mean rate: 0.902232
- se(sample mean rate): 0.00314
- Output (Leading Digit Rule, LDR):
  sample mean rate: 0.902
  (Ok, since it should be 0.9)