Name: _____

Directions: **Work only on this sheet** (on both sides, if needed); do not turn in any supplementary sheets of paper. There is actually plenty of room for your answers, as long as you organize yourself BEFORE starting writing.

In both problems below, the page numbers refer to our PLN titled "Introduction to Discrete-Event Simulation and the SimPy Language."

1. Consider our example program **MachRep1.py** starting on p.9. Suppose we have three machines instead of two, with the following actions: Machine 0 is up for 1.2, down for 0.9, up for 0.4 etc. For Machine 1, the corresponding sequence is 0.8, 0.7 and 1.3. For Machine 2, it is 1.3, 0.1 and 0.6. Show the contents of the event list <u>just before</u> the SimPy internals advance the simulated clock to 2.0:

machine ID	event time

2. Show how to use SimPy's **Monitor** class to compute mean residence time in the program **SMP.py**, which starts on p.20. Your answer should consist of statements of the form "Delete line 23," "Replace line 168 by the following code," and "Between lines 8888 and 8889 insert the following code."

Solutions:

1.

Events by machine:

machine	events
0	down at 1.2, up at 2.1, down at 2.5
1	down at 0.8, up at 1.5, down at 2.8
2	down at 1.3, up at 1.4, down at 2.0

just before time	the event list will be
0.8	0.8, 1.2, 1.3
1.2	1.2, 1.3, 1.5
1.3	1.3, 1.5, 2.1
1.4	1.4, 1.5, 2.1
1.5	1.5, 2.0, 2.1
2.0	2.0, 2.1, 2.8

So, the answer is

machine ID	event time
2	2.0
0	2.1
1	2.8

Note that the event for time 2.5 is NOT there yet, as it is not generated until time 2.1.

2.

```
46.5   Mon = Monitor()
77     Processor.Mon.observe(now()-self.StartWait)
94     print 'mean residence time', Processor.Mon.mean()
```