John West 9/19/16
Cs 314 HW2

1. Part A: With Fork and every time printf is called, exit is called 14 times.

```
[jowest@os 1]$ ./1
1
2
2
3
3
3
[jowest@os 1]$ 1
2
2
3
3
3
3
3
```

Part 2: 11 2222 33333333
For each fork run, the printf runs based on where it's placed after the fork. The 1st print will print 1 twice, the 2nd will print 2 4 times because it's there are 2 forks running, and the 3rd will print 3 8 times because there are now 3 forks running.

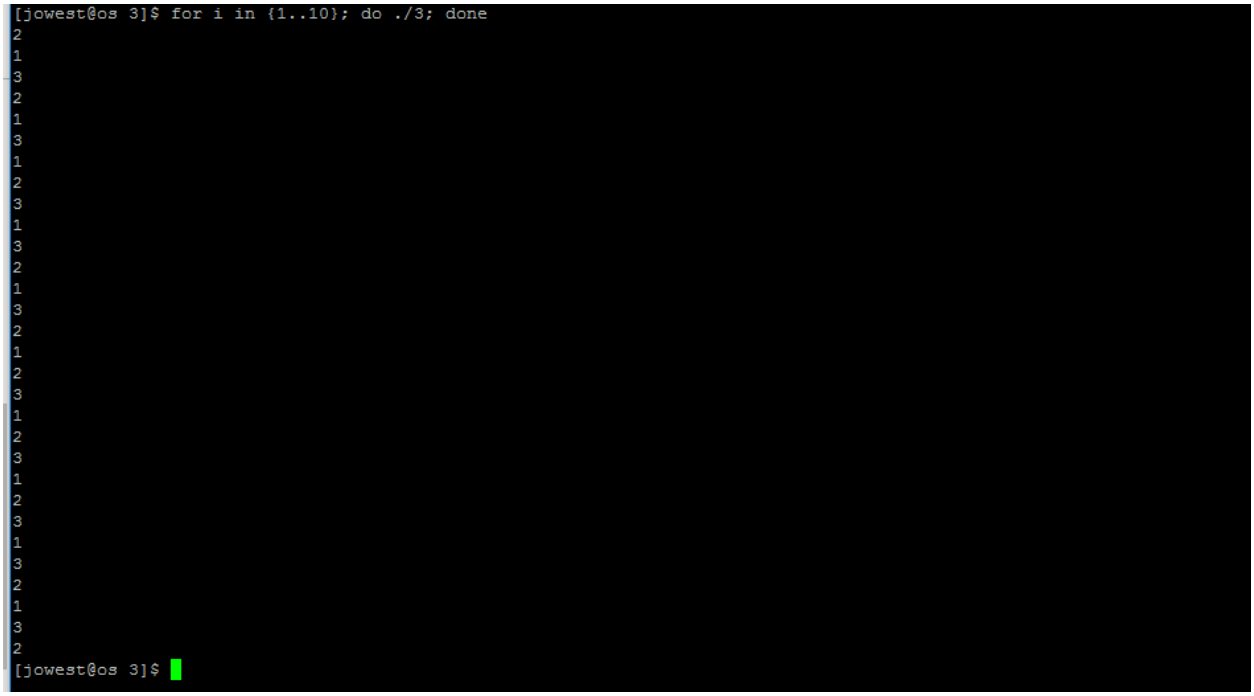
2. Original:

```
[jowest@os 2]$ for i in {1..10}; do ./2; wc -l numbers; done
100134 numbers
100441 numbers
100014 numbers
100008 numbers
100441 numbers
100187 numbers
100034 numbers
100124 numbers
100363 numbers
100047 numbers
[jowest@os 2]$ for i in {1..10}; do { time -p ./2; } 2>&1 > /dev/null | grep real| awk '{print $2}' >> times; done;
[jowest@os 2]$ cat times | awk '{for (i=1; i<=NF; i++) s=s+$1}; END{print s/10}'
0.076
[jowest@os 2]$
```

Modified:

```
[jowest@os 2]$ for i in {1..10}; do ./2; wc -l numbers; done
100000 numbers
100000 numbers
100000 numbers
100000 numbers
100000 numbers
100000 numbers
100000 numbers
100000 numbers
100000 numbers
100000 numbers
[jowest@os 2]$ for i in {1..10}; do { time -p ./2; } 2>&1 > /dev/null | grep real| awk '{print $2}' >> times; done;
[jowest@os 2]$ cat times | awk '{for (i=1; i<=NF; i++) s=s+$1}; END{print s/10}'
0.156
[jowest@os 2]$
```

3. Original:



Modified:

4.