Homework #1
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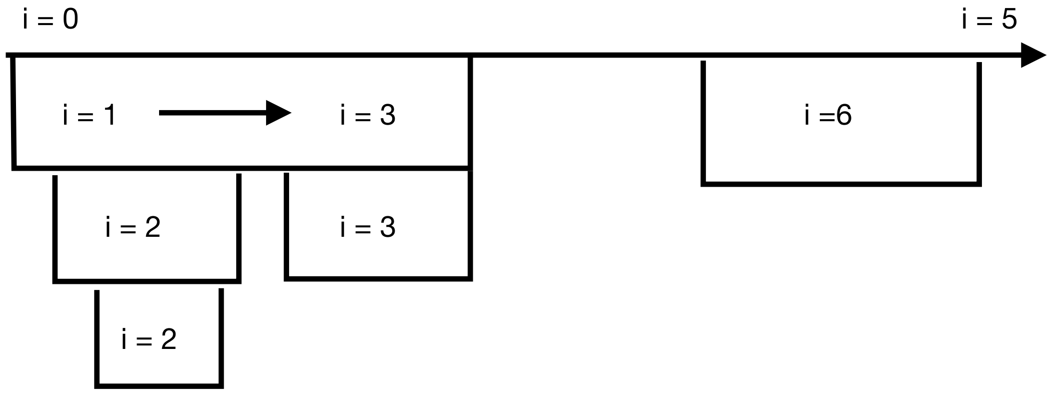
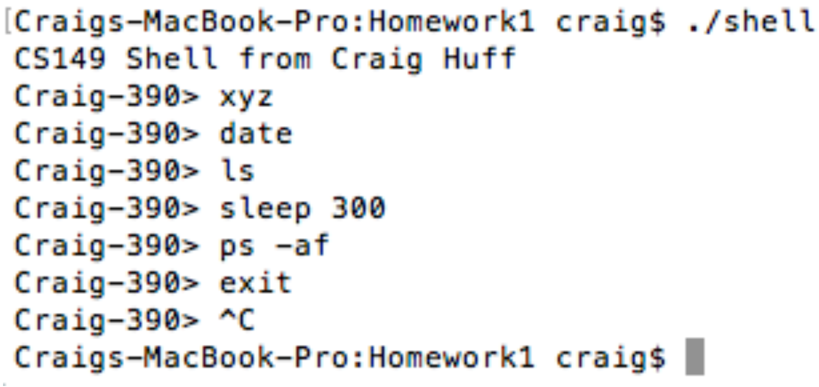
CS 149 -02

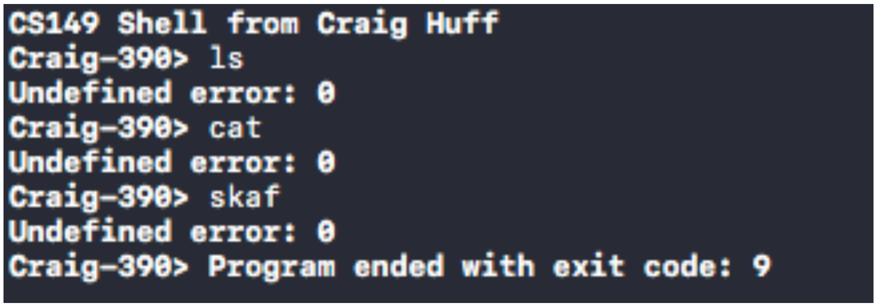
1. Given the following program. At the end of the program execution, what is the total number of processes (including the initial parent process)? And what is the value of I before each process terminates? Please draw the parent-child process hierarchy to justify your answer.



2.



```
[Craigs-MacBook-Pro:Homework1 craig$ ./shell
CS149 Shell from Craig Huff
Craig-390> xyz
Craig-390> date
Craig-390> ls
Craig-390> sleep 300
Craig-390> ps -af
Craig-390> exit
Craig-390> ^C
Craigs-MacBook-Pro:Homework1 craig$ 
```



```
CS149 Shell from Craig Huff
Craig-390> ls
Undefined error: 0
Craig-390> cat
Undefined error: 0
Craig-390> skaf
Undefined error: 0
Craig-390> Program ended with exit code: 9
```

In step a, the output from two executions of “ps –af” should include the same process “sleep 300” with identical PID but with different parent PID (PPID).

Explain the reason
Identify which process is the new parent process of “sleep 300”. This can be done by invoking the following
command in the real shell from a terminal (where NNN is the new PPID of “sleep 300”). ps -p NNN

- The reason the processes have different PPID is because they have different parents. The parent for the shell on the computer will have a different parent that the shell that I created.
- The parent process of sleep 300 is the shell