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ECE357

Problem Set 3

Problem 1

a)

- f1 would be placed in the stack because it is a function which contains information such as arguments and pointer to a return address.
- i is associate with the data region because it is a global variable with value 10.
- ws is associated with the stack region because it is local variable.
- z is associated with data region because it is a global variable with value 0.

b)

Output:

10

11

11

12

Explanation: When the code is executed, the program outputs 10 and "i" is incremented. When the statement fork() = = 0 is checked when the "if statement" is called, a child process it created with a return value 0, allowing it to execute an identical copy of the code, outputting a value of 11 and incrementing "I". The parent function skips the if statement and outputs a 12 once f1() is called. Then before the child process can run, the parent function terminates it using wait().

c) The output is in deterministic because the processes are running at the same time and one can execute code before the other, changing the output. depending on what the kernel chooses to do.

d) echo $ stores the exit value of the last command that was executed. Since ws is a signed int of -1, its binary value is 11111111. When right shifted, the return value is 0.

Problem 2

a) The output is XY because when C allocates memory for the cells of a character array, it fills them with 0, which when called through printf and specified as string, results in no value.
b) The next program is osps3.py. The augment vector is:

   argv[0]: /usr/bin/python

   argv[1]: -B

   argv[2]: "/tmp/osps3.py

   argv[3]: osps3.py

   argv[4]: myinput.txt

c) They come from the original init parent process and commands from the shell.