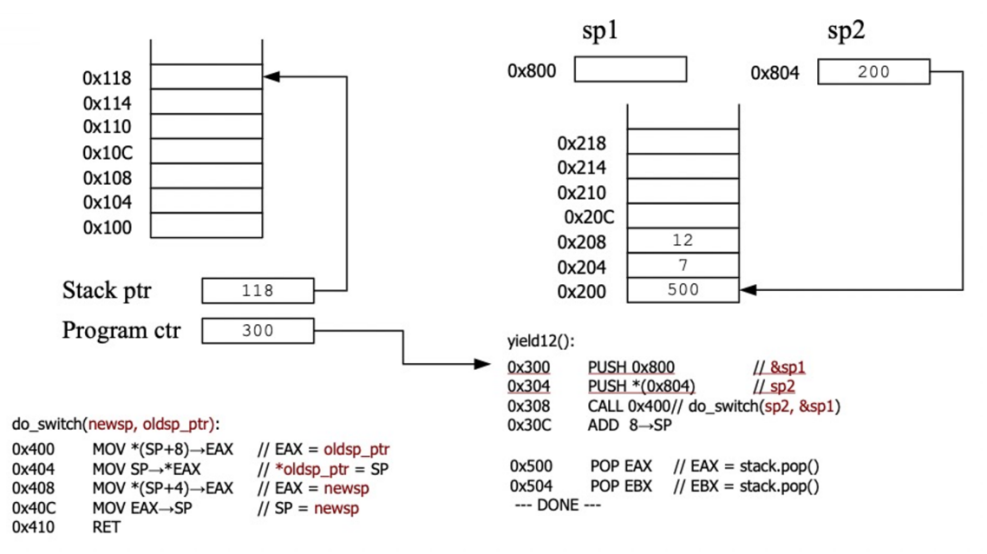
Week 5 CS5600

Program Execution and Process Queue

Student: Ben Henshaw, henshaw.b@northeastern.edu

Problem 1: Explore program execution



For each of the instructions, give the following information:

(i) Instruction address, *i.e.*, the value of the program counter [PC]

(ii) The instruction at that address, *i.e.,* "MOC SP → *EAX")

(iii) Identify any registers or memory locations that are modified by that instruction, and provide their new contents.

(iv) For any control flow instructions (JMP, CALL, RET) give the destiation address *i.e.,* "0x704, RET: jump to 0x940, SP changes from 0x11FC to 0x1200"

As an example, here's what the deliverable looks like for the first instruction:

(a) 0x300

(b) "PUSH 0x800"

(c) 114→SP, 304→PC 0x800→*0x114

1. (a) 0x300
   (b) "PUSH 0x800"
   (c) 0x114→SP, 0x304→PC 0x800→*0x114
2. (a) 0x304
   (b) "PUSH *(0x804)"
   (c) 110→SP, 308→PC, 200→*0x110

3. (a) 0x308
   (b) "CALL 0x400"
   (c) 10C→SP, 400→PC, 30C→*0x10C
4. (a) 0x400
   (b) "MOV *(SP+8)→EAX"
   (c) 0x800→EAX, 404→PC
5. (a) 0x404
   (b) "MOV SP→*EAX"
   (c) 10C→*0x800, 408→PC
6. (a) 0x408
   (b) "MOV *(SP+4)→EAX"
   (c) 200→EAX, 40C→PC
7. (a) 0x40C
   (b) "MOV EAX→SP"
   (c) 200→SP, 410→PC
8. (a) 0x410
   (b) "RET"
   (c) 0x500→PC, 0x204→SP
9. (a) 0x500
   (b) "POP EAX"
   (c) 7→EAX, 0x208→SP, 0x504→PC
10. (a) 0x504
    (b) "POP EBX"
    (c) 12→EBX, 0x20C→SP, 0x50C→PC