1 Practice Questions

1.1 Processes

List the two important illusions that the process abstraction provides to programs. For each illusion, list a mechanism involved in its implementation.

1.2 Virtual Memory

One purpose of virtual memory is to allow programs to use more memory than is available in the physical memory by storing some parts on disk transparently. Name some $\it other$ useful thing that can be done with the virtual memory system.

1.3 TLBs

Does a TLB (Translation Lookaside Buffer) miss always lead to a page fault? Why or why not?

1.4 Java and C

Name some differences between Java and C.

1.5 Structs

Consider the following definition of the struct below, answer the questions regarding the struct.

```
typedef struct data_struct
{
  int a;
  char b[3];
  short c;
  void * d;
} data struct;
```

- a) Assume you have an data_struct array of size two, on the memory diagram below, please shade in and label the memory blocks for each field of each struct. (You can assume that the first array index starts at element 0x0).
- b) What is the total size of this struct?
- c) Would re-ordering the fields from largest to smallest reduce the size of the struct?
- d) What would be the assembly instructions for getting the value of field d out of the struct? Assume that the register $rac{1}{2}$ rac points to the beginning of the struct. Return the value in register $rac{1}{2}$ rax.

Memory Address								
	+0	+1	+2	+3	+4	+5	+6	+7
0x00								
80x0								
0x10								
0x18								
0x20								
0x28								