ICS Homework 3

March 2, 2022

1 SEQ Processor (Composition)

Suppose we are going to implement **crmmovl rA, D(rB)**, which conditionally write rA to memory, in our SEQ Y86_64 processor.

1. How long is the `crmmovl` instruction?
2. Fill the table below.

Stage	`crmmovl rA, D(rB)`
Fetch	
Decode	
Execute	
Memory	
Write back	
PC update	

2 System Software

2.1 Fork & Execve

Read the C program and answer the question below. **NOTE:**/bin/echo is an executable file that will print its arguments on the screen.

```
#include  <stdio.h>
#include  <stdlib.h>
#include  <unistd.h>
#include  <sys/types.h>
#include  <sys/wait.h>

char ch;

int main()
{
    ch = 'A';
    if (fork() == 0) {
        ch = 'B';
        printf("%c\n", ch);
        if (fork() == 0) {
```

```
16              printf("C\n");
17          }else {
18              exit (0);
19          }
20      } else {
21          while (waitpid(-1, NULL, 0) > 0);
22          char *my_argv [] = {"/bin/echo", &ch, 0};
23          execve(my_argv[0], my_argv, 0);
24      }
25      return 0;
26  }
```

What is the possible output of this program? Is the output deterministic? Please explain why.