CS591-5 Assignment 1

1. **Regular Expressions**. Write regular expressions that accept: $(5 + 5)$

   (a) Java numeric constants.

   (b) a sequence of valid file operations in a C program using the file operations `fopen,fclose,fread`and `fwrite`.

2. **Three address codes**. Write three address code that may be generated for the following piece of C code: (5)

```
i = 0;
do {
    x ++;
    if (x > 3 || x < y) continue;
    y += i * 2;
} while (y < n);
```

3. **Constant Propagation**. For the following code identify the constants at different program points. Use the algorithm discussed in the class and show the progress of the algorithm by listing the constants before processing each statement. [Just show the values of the variables before each statement, like we had shown in the class.] (5)

```
1. int foo (int a){
2.   int i=1, j = 2, k = 3, l;
3.   l = a + i;
4.   while (j < k) {
5.      if (l < i){
6.          i = k - j;
7.          j = j * 1;
8.          k = k - i;
9.      } else {
10.         i = k - 2;
11.         j = j + 0;
12.         k = k - 1;
13.     }
14.  }
15. }
```