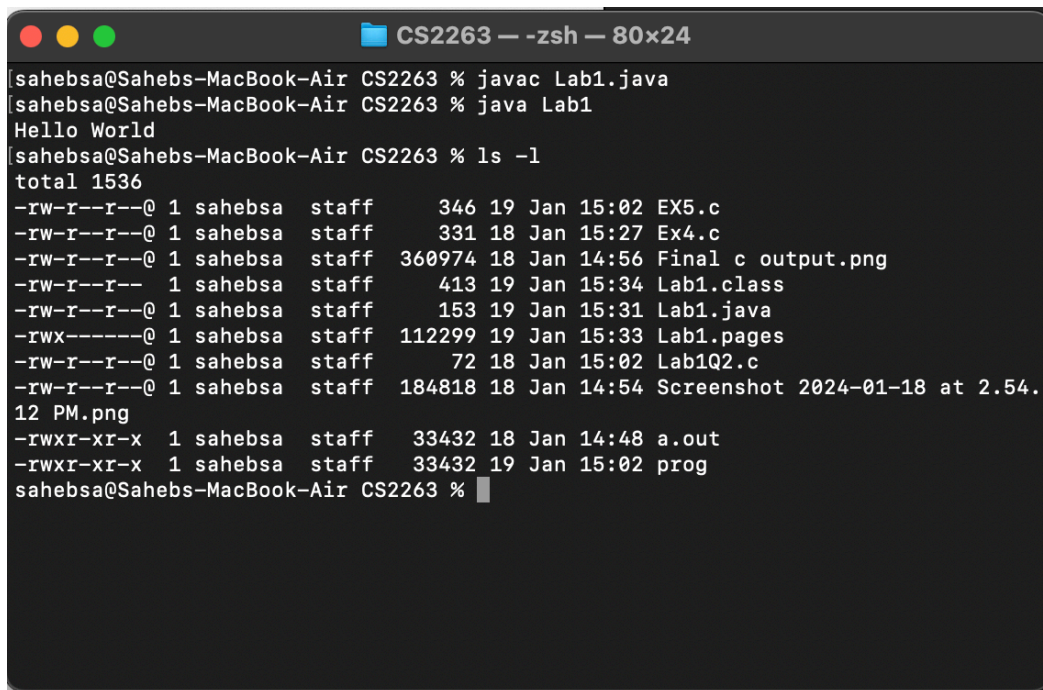


## CS2263 Lab 1

### Exercise 1

```
1.1) /**
@author Saheb Singh Arora
Student id 3742233
*/
public class Lab1{
    public static void main(String[]args){
        System.out.println("Hello World");
    }
}
```



A terminal window titled "CS2263 — -zsh — 80x24" on a macOS system. The user, sahebsa, is in the directory CS2263. The terminal shows the following commands and output:

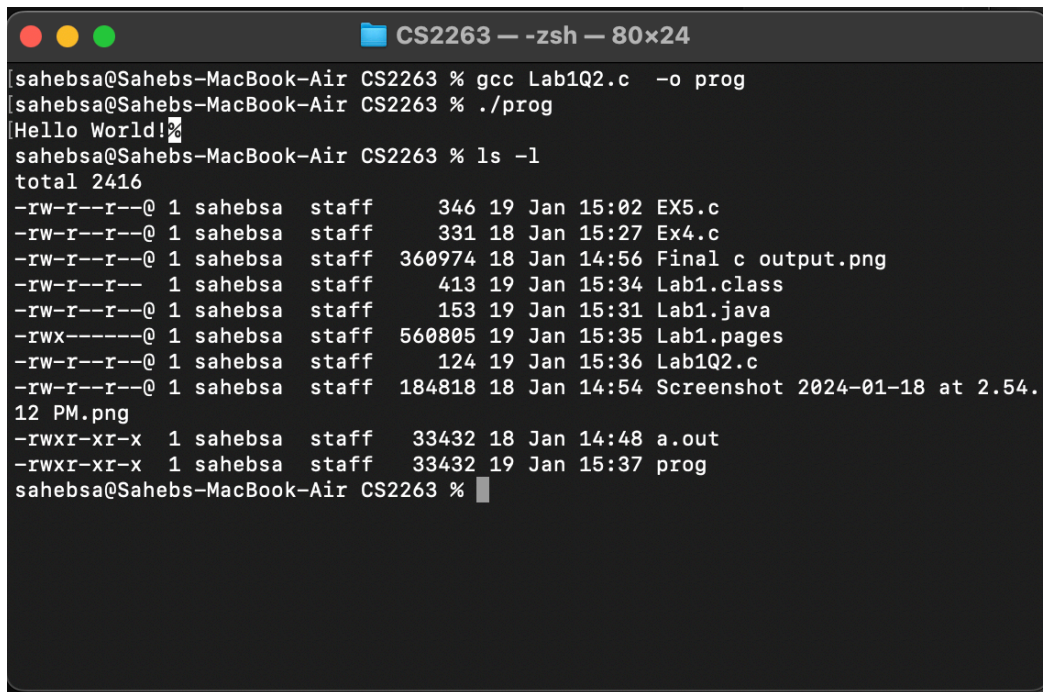
```
[sahebsa@Sahebs-MacBook-Air CS2263 % javac Lab1.java]
[sahebsa@Sahebs-MacBook-Air CS2263 % java Lab1]
Hello World
[sahebsa@Sahebs-MacBook-Air CS2263 % ls -l]
total 1536
-rw-r--r--@ 1 sahebsa  staff    346 19 Jan 15:02 EX5.c
-rw-r--r--@ 1 sahebsa  staff    331 18 Jan 15:27 Ex4.c
-rw-r--r--@ 1 sahebsa  staff 360974 18 Jan 14:56 Final c output.png
-rw-r--r--  1 sahebsa  staff    413 19 Jan 15:34 Lab1.class
-rw-r--r--@ 1 sahebsa  staff    153 19 Jan 15:31 Lab1.java
-rwx-----@ 1 sahebsa  staff 112299 19 Jan 15:33 Lab1.pages
-rw-r--r--@ 1 sahebsa  staff     72 18 Jan 15:02 Lab1Q2.c
-rw-r--r--@ 1 sahebsa  staff 184818 18 Jan 14:54 Screenshot 2024-01-18 at 2.54.
12 PM.png
-rwxr-xr-x  1 sahebsa  staff   33432 18 Jan 14:48 a.out
-rwxr-xr-x  1 sahebsa  staff   33432 19 Jan 15:02 prog
sahebsa@Sahebs-MacBook-Air CS2263 %
```

## Exercise 2

2.1

```
/**
 * @author Saheb Singh Arora
 * Student id 3742233
 */
#include <stdio.h>

int main() {
    printf("Hello World!");
    return 0;
}
```

A terminal window titled "CS2263 — -zsh — 80x24" on a MacBook Air. The user 'sahebsa' is in the directory 'CS2263'. The terminal shows the compilation of 'Lab1Q2.c' into 'prog' using 'gcc'. The program is then executed with './prog', resulting in the output 'Hello World!'. Finally, the user runs 'ls -l' to list the directory contents, showing files like 'EX5.c', 'Ex4.c', 'Final c output.png', 'Lab1.class', 'Lab1.java', 'Lab1.pages', 'Lab1Q2.c', 'Screenshot 2024-01-18 at 2.54.12 PM.png', 'a.out', and 'prog'.

```
CS2263 — -zsh — 80x24
sahebsa@Sahebs-MacBook-Air CS2263 % gcc Lab1Q2.c -o prog
sahebsa@Sahebs-MacBook-Air CS2263 % ./prog
Hello World!
sahebsa@Sahebs-MacBook-Air CS2263 % ls -l
total 2416
-rw-r--r--@ 1 sahebsa  staff    346 19 Jan 15:02 EX5.c
-rw-r--r--@ 1 sahebsa  staff    331 18 Jan 15:27 Ex4.c
-rw-r--r--@ 1 sahebsa  staff 360974 18 Jan 14:56 Final c output.png
-rw-r--r--  1 sahebsa  staff    413 19 Jan 15:34 Lab1.class
-rw-r--r--@ 1 sahebsa  staff    153 19 Jan 15:31 Lab1.java
-rwx-----@ 1 sahebsa  staff 560805 19 Jan 15:35 Lab1.pages
-rw-r--r--@ 1 sahebsa  staff    124 19 Jan 15:36 Lab1Q2.c
-rw-r--r--@ 1 sahebsa  staff 184818 18 Jan 14:54 Screenshot 2024-01-18 at 2.54.
12 PM.png
-rwxr-xr-x  1 sahebsa  staff   33432 18 Jan 14:48 a.out
-rwxr-xr-x  1 sahebsa  staff   33432 19 Jan 15:37 prog
sahebsa@Sahebs-MacBook-Air CS2263 %
```

## Exercise 3

### 3.1

There are two steps involved in writing a Java program. The code is converted into bytecode, an intermediate layout, by the Java compiler. Subsequently, this bytecode is interpreted or compiled into instructions the computer may execute via the Java Virtual Machine (JVM). This is the reason why you must use the `java` command to tell the JVM to perform this task when you execute a Java program. C programs, on the other hand, are directly compiled into machine code and produced as independent software. Because of this, running C programs doesn't require a special command; instead, they can be executed directly without the requirement for a middleware like the JVM.

## Exercise 4

### 4.1

```
/**
 * @author Saheb Singh Arora
 * Student id 3742233
 */
#include <stdio.h>

int main() {
    int n = 10;
    int fib[n];

    fib[0] = 0;
    fib[1] = 1;

    printf("Fibonacci Sequence (first %d values):\n", n);
    printf("%d\n%d\n", fib[0], fib[1]);

    for (int i = 2; i < n; i++) {
        fib[i] = fib[i - 1] + fib[i - 2];
        printf("%d\n", fib[i]);
    }

    return 0;
}
```

```
CS2263 — -zsh — 93x26
[sahebsa@Sahebs-MacBook-Air CS2263 % gcc Ex4.c -o prog
[sahebsa@Sahebs-MacBook-Air CS2263 % ./prog
Fibonacci Sequence (first 10 values):
0
1
1
2
3
5
8
13
21
34
[sahebsa@Sahebs-MacBook-Air CS2263 % ls -l
total 3128
-rw-r--r--@ 1 sahebsa  staff    346 19 Jan 15:02 EX5.c
-rw-r--r--@ 1 sahebsa  staff    383 19 Jan 15:56 Ex4.c
-rw-r--r--@ 1 sahebsa  staff 360974 18 Jan 14:56 Final c output.png
-rw-r--r--  1 sahebsa  staff    413 19 Jan 15:34 Lab1.class
-rw-r--r--@ 1 sahebsa  staff    153 19 Jan 15:31 Lab1.java
-rwx-----@ 1 sahebsa  staff 950519 19 Jan 15:58 Lab1.pages
-rw-r--r--@ 1 sahebsa  staff    124 19 Jan 15:36 Lab1Q2.c
-rw-r--r--@ 1 sahebsa  staff 184818 18 Jan 14:54 Screenshot 2024-01-18 at 2.54.12 PM.png
-rwxr-xr-x  1 sahebsa  staff  33432 18 Jan 14:48 a.out
-rwxr-xr-x  1 sahebsa  staff  33608 19 Jan 15:58 prog
sahebsa@Sahebs-MacBook-Air CS2263 %
```

## Exercise 5

### 5.1

```
/**
 * @author Saheb Singh Arora
 * Student id 3742233
 */
#include <stdio.h>

int main() {
    int a = 0;
    int b = 1;
    int c = 1;
    int num=0;

    printf("Every second value in the Tribonacci sequence
are as follows:\n");
    printf("%d\n%d\n", a,b);

    for(int i = 0 ; i < 16 ; i++){
        num=a+b+c;
        a=b;

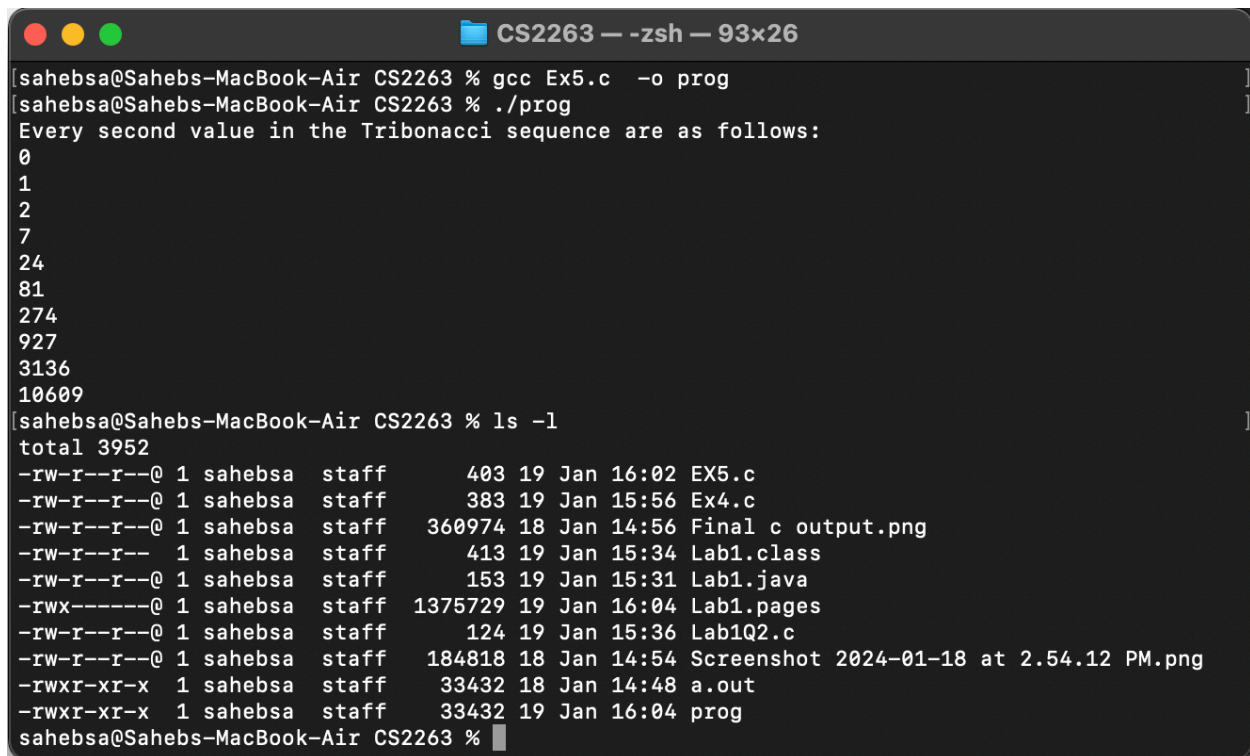
        b=c;
        c=num;
    }
}
```

```

    if(i%2 == 0){
        printf("%d\n",num);
    }

}

```



A terminal window titled "CS2263 — -zsh — 93x26" on a macOS system. The user, sahebsa, is in the directory CS2263. They compile a C program 'Ex5.c' into 'prog' using 'gcc'. Then they run './prog', which prints the Tribonacci sequence values at every second index: 0, 1, 2, 7, 24, 81, 274, 927, 3136, 10609. Finally, they run 'ls -l' to list the directory contents, showing files like EX5.c, Ex4.c, Final c output.png, Lab1.class, Lab1.java, Lab1.pages, Lab1Q2.c, Screenshot 2024-01-18 at 2.54.12 PM.png, a.out, and prog.

```

[sahebsa@Sahebs-MacBook-Air CS2263 % gcc Ex5.c -o prog
[sahebsa@Sahebs-MacBook-Air CS2263 % ./prog
Every second value in the Tribonacci sequence are as follows:
0
1
2
7
24
81
274
927
3136
10609
[sahebsa@Sahebs-MacBook-Air CS2263 % ls -l
total 3952
-rw-r--r--@ 1 sahebsa  staff      403 19 Jan 16:02 EX5.c
-rw-r--r--@ 1 sahebsa  staff      383 19 Jan 15:56 Ex4.c
-rw-r--r--@ 1 sahebsa  staff    360974 18 Jan 14:56 Final c output.png
-rw-r--r--  1 sahebsa  staff       413 19 Jan 15:34 Lab1.class
-rw-r--r--@ 1 sahebsa  staff       153 19 Jan 15:31 Lab1.java
-rwx-----@ 1 sahebsa  staff   1375729 19 Jan 16:04 Lab1.pages
-rw-r--r--@ 1 sahebsa  staff       124 19 Jan 15:36 Lab1Q2.c
-rw-r--r--@ 1 sahebsa  staff    184818 18 Jan 14:54 Screenshot 2024-01-18 at 2.54.12 PM.png
-rwxr-xr-x  1 sahebsa  staff    33432 18 Jan 14:48 a.out
-rwxr-xr-x  1 sahebsa  staff    33432 19 Jan 16:04 prog
sahebsa@Sahebs-MacBook-Air CS2263 %

```

```

}

```