

```
package week2Homework1;

public class TimeTestFib {

    public TimeTestFib(int n) {
        // TODO Auto-generated constructor stub
        long total = 0;
        for (int i = 0; i < n; i++) {
            total += i;
        }
    }

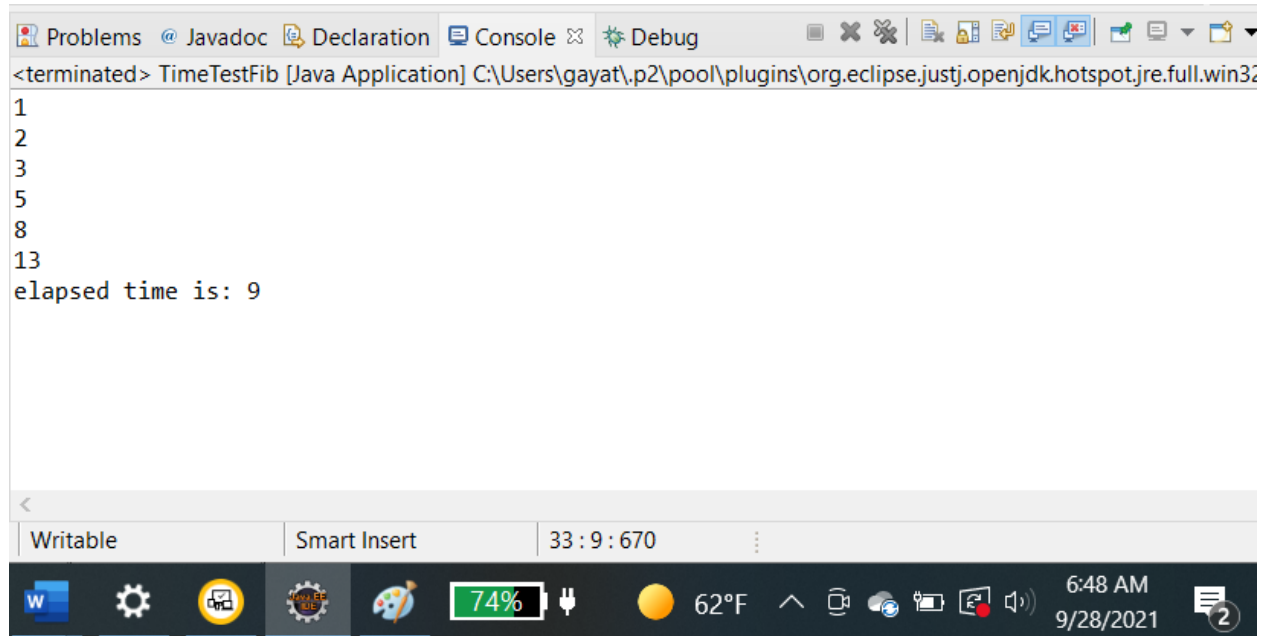
    static int fib(int n) {
        int a = 0, b=1, c;
        if (n == 0)
            System.out.println(a);
        else if (n == 1)
            System.out.println(a + " " + b);
        for (int i = 2; i <= n; i++) {
            c = a + b;
            a = b;
            b = c;
            System.out.println(c + " ");
        }
        return b;
    }

    static int fibRec(int n) {
        if(n <= 1)
            return n;
        return fibRec(n-1) + fibRec(n-2);
    }

    public static void main(String[] args) {
        long startTime = System.currentTimeMillis();
        //fib(7);
        fibRec(7);
        long total = 0;
        //for(int i = 0; i < 10000000; i++) {
        for(int i = 0; i < 20; i++) {
            total += i;
        }
        long stopTime = System.currentTimeMillis();
        long elapsedTime = stopTime - startTime;
        System.out.println("elapsed time is: " + elapsedTime);
    }
}
```

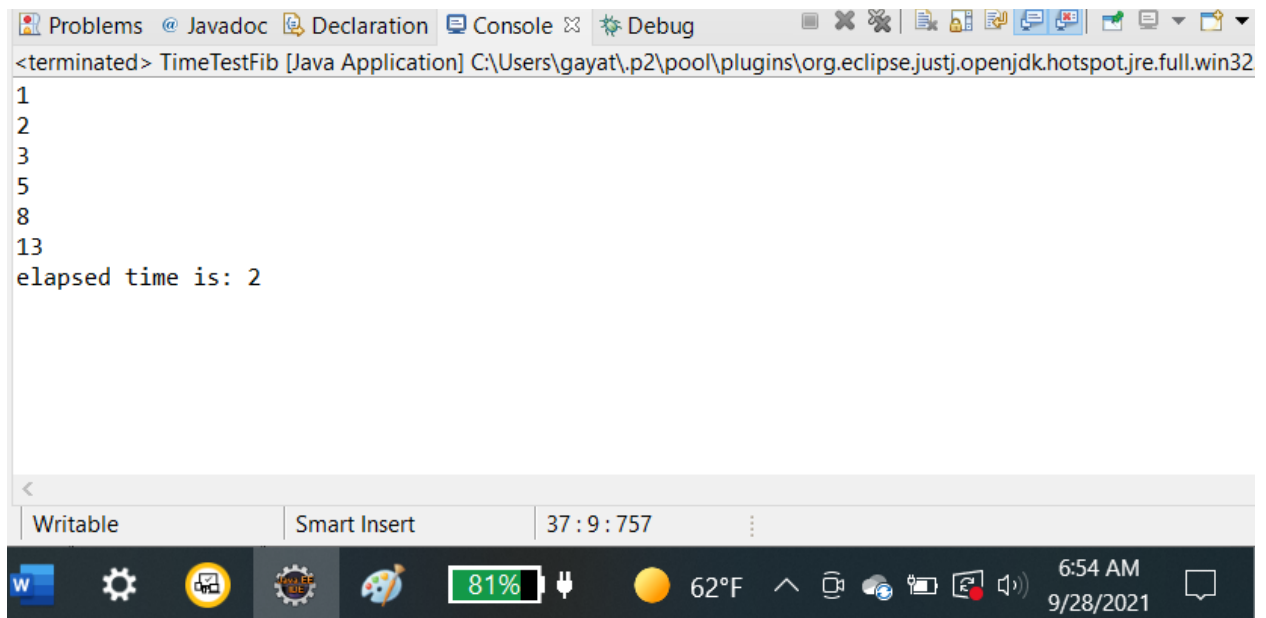
CS455 Week2 Homework 2

Elapsed time output with iterative Fibonacci with 100000 cycles



```
<terminated> TimeTestFib [Java Application] C:\Users\gayat\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32
1
2
3
5
8
13
elapsed time is: 9
```

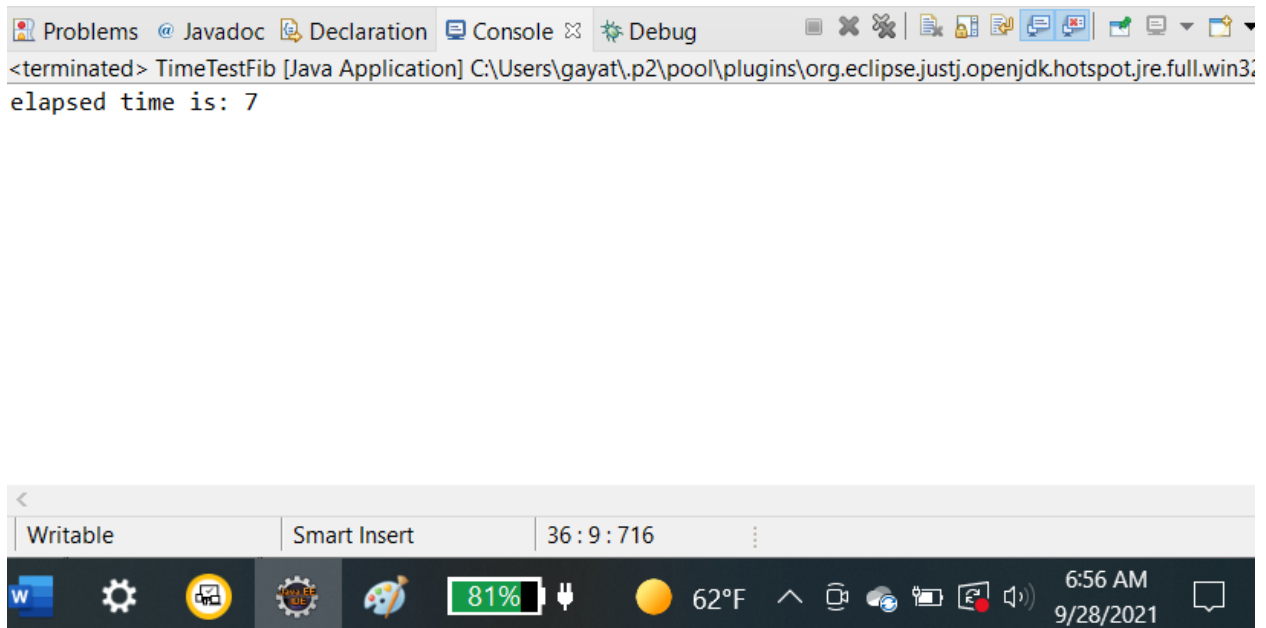
Elapsed time output with iterative Fibonacci with 20 cycles



The screenshot shows the Eclipse IDE's console window. The title bar includes tabs for Problems, Javadoc, Declaration, Console, and Debug. The console text shows the output of a Java application named TimeTestFib, which has terminated. The output consists of the first 20 Fibonacci numbers (1 through 13) and the statement "elapsed time is: 2". The status bar at the bottom indicates the editor is in "Writable" mode, has "Smart Insert" enabled, and shows a timer of 37:9:757. The Windows taskbar at the very bottom shows the system clock as 6:54 AM on 9/28/2021, along with battery and temperature indicators.

```
<terminated> TimeTestFib [Java Application] C:\Users\gayat.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32
1
2
3
5
8
13
elapsed time is: 2
```

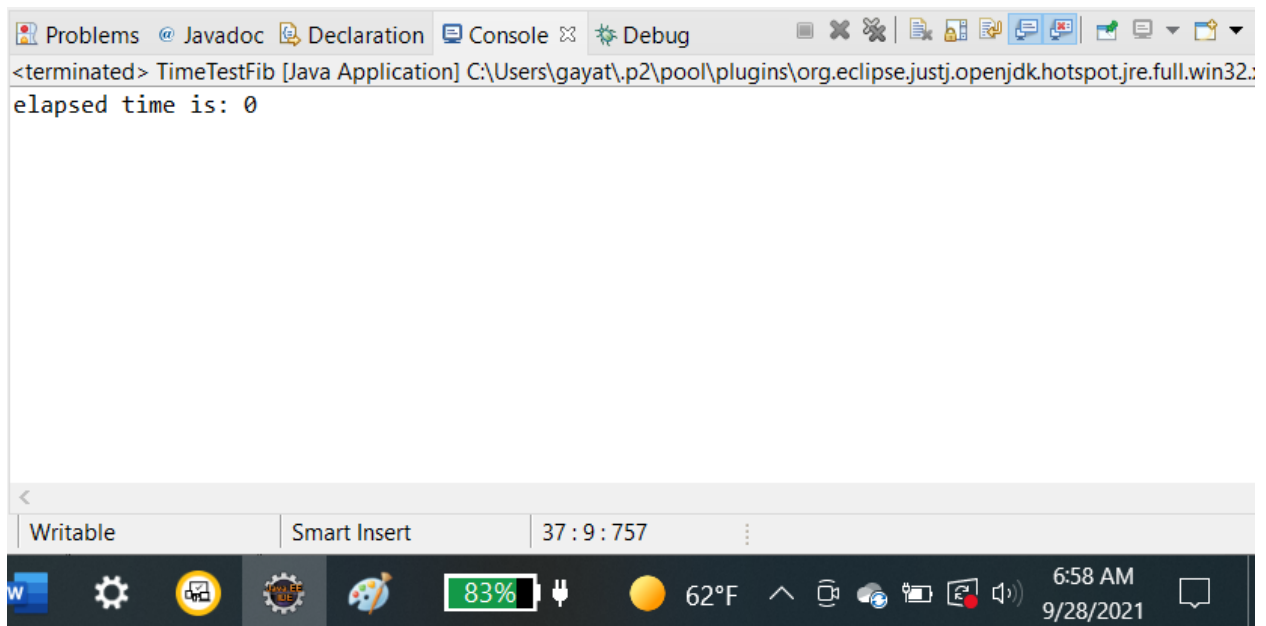
Elapsed time output with recursive Fibonacci with 100000 cycles



The screenshot shows the Eclipse IDE's console window. The title bar includes tabs for Problems, Javadoc, Declaration, Console, and Debug. The console text shows the output of a Java application named TimeTestFib, which has terminated. The output is the statement "elapsed time is: 7". The status bar at the bottom indicates the editor is in "Writable" mode, has "Smart Insert" enabled, and shows a timer of 36:9:716. The Windows taskbar at the very bottom shows the system clock as 6:56 AM on 9/28/2021, along with battery and temperature indicators.

```
<terminated> TimeTestFib [Java Application] C:\Users\gayat.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win3:
elapsed time is: 7
```

Elapsed time output with recursive Fibonacci with 20 cycles

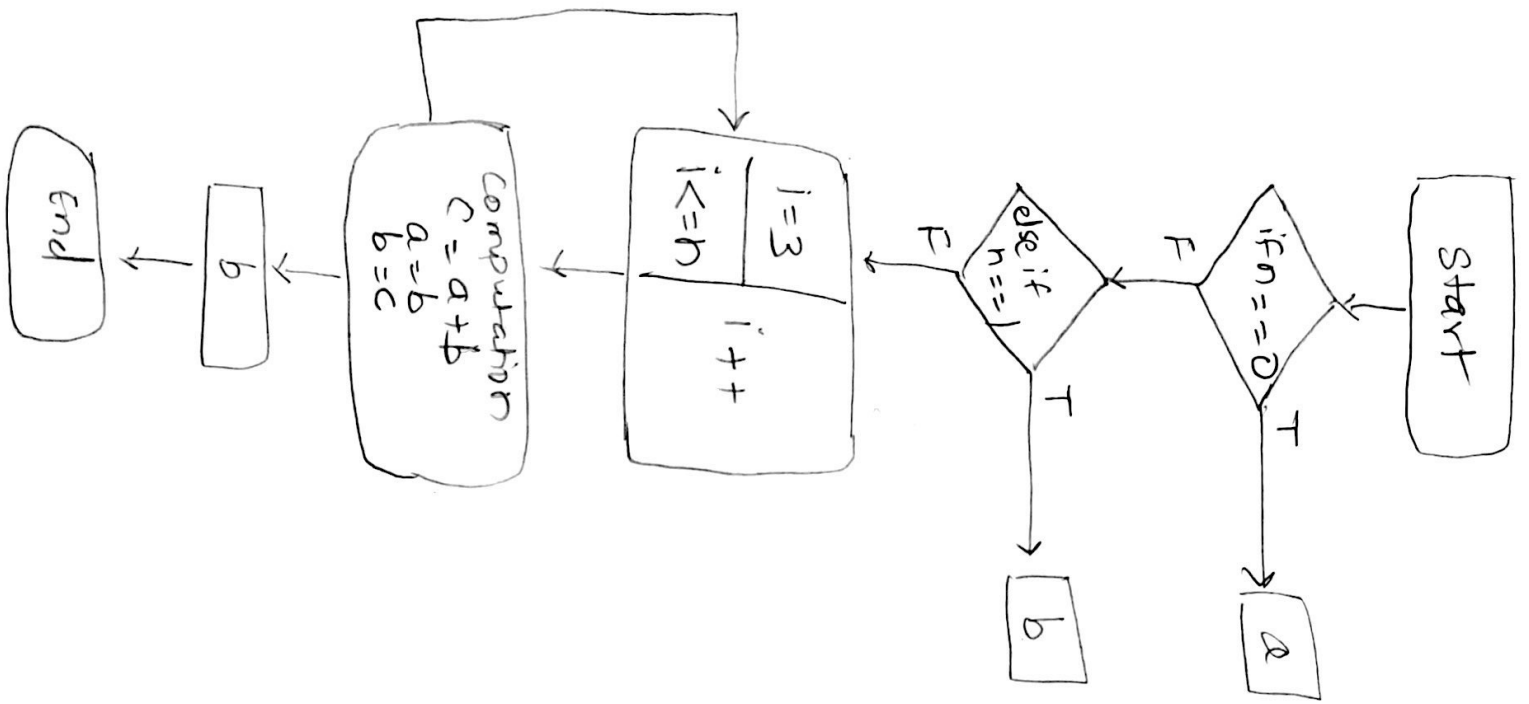


The screenshot shows the Eclipse IDE interface. The top bar includes tabs for Problems, Javadoc, Declaration, Console, and Debug. The Console tab is active, displaying the output: `<terminated> TimeTestFib [Java Application] C:\Users\gayat\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64.jdk\bin\java.exe -Xmx1024m -Djava.awt.headless=true -Djava.compiler=NONE -Dfile.encoding=UTF-8 -Djava.io.tmpdir=C:\Users\gayat\AppData\Local\Temp\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64.jdk\bin\java\temp\ -jar C:\Users\gayat\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64.jdk\bin\java\lib\java.base.jar TimeTestFib 20`. Below this, the output `elapsed time is: 0` is visible. The bottom status bar shows 'Writable', 'Smart Insert', and a timer at '37:9:757'. The Windows taskbar at the bottom displays the system clock as 6:58 AM on 9/28/2021, along with battery, network, and other system icons.

```
<terminated> TimeTestFib [Java Application] C:\Users\gayat\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64.jdk\bin\java.exe -Xmx1024m -Djava.awt.headless=true -Djava.compiler=NONE -Dfile.encoding=UTF-8 -Djava.io.tmpdir=C:\Users\gayat\AppData\Local\Temp\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64.jdk\bin\java\temp\ -jar C:\Users\gayat\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64.jdk\bin\java\lib\java.base.jar TimeTestFib 20
elapsed time is: 0
```

Observations=>

- 1)Time used by recursive Fibonacci for 100000 cycles is 7 milliseconds which is less than time used by iterative Fibonacci for 100000 cycles is 9 milliseconds
- 2)Time used by recursive Fibonacci for 20 cycles is 0 milliseconds which is less than time used by iterative Fibonacci for 20 cycles is 2 milliseconds
- 3)recursive Fibonacci is faster than iterative Fibonacci



RAM		Screen			
n	i	i <= n	a	b	c
0			0	1	1
1				1	2
2	2	T	0	1	1
3	3	T	1	1	2
4					
5					