LAB 1

(K BHAVANI VENKATA KARTHIK 2019503511)

1. Write a program that takes as input Fahrenheit temperature. It converts the input temperature to Celsius and prints out the converted temperature as shown in the example. The formula for conversion between the two is: C=5/9(F−32), Where C is the temperaturein Celsius and F is the temperature in Fahrenheit. Note:round your answer to up to two decimal places.

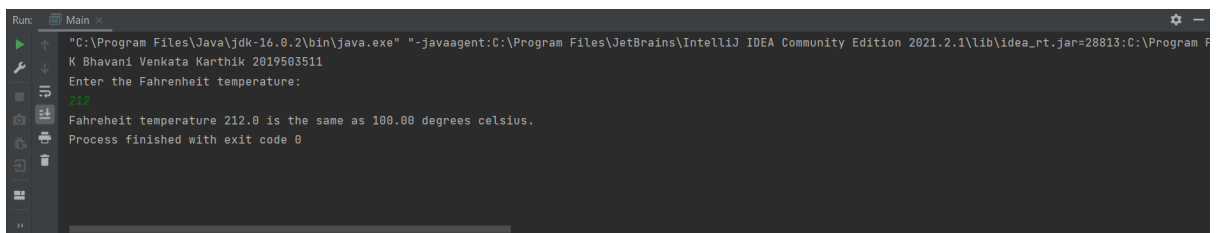**Source Code**

```java
package com.company;
import java.util.Scanner;

public class Main {

    public static void main(String[] args) {
        Scanner in=new Scanner(System.in);
        System.out.println("K Bhavani Venkata Karthik 2019503511");
        System.out.println("Enter the Fahrenheit temperature:");
        float F=in.nextFloat();
        double C=5.0/9.0*(F-32);
        System.out.printf("Fahreheit temperature " + F + " is the same as
%.2f degrees celsius.",C);
    }
}
```
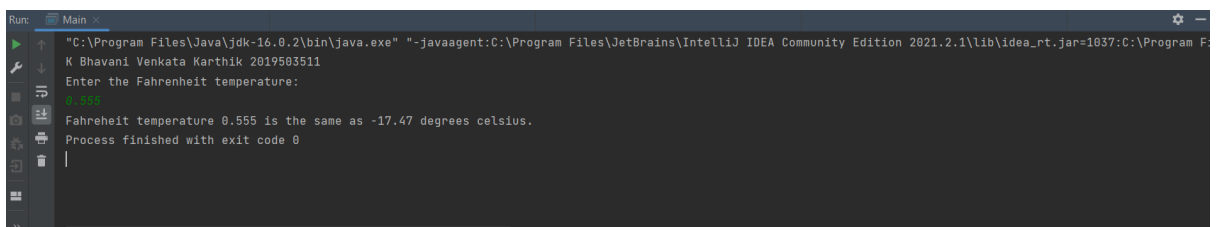
Outputs

```
"C:\Program Files\Java\jdk-16.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.1\lib\idea_rt.jar=28813:C:\Program F
K Bhavani Venkata Karthik 2019503511
Enter the Fahrenheit temperature:
212
Fahreheit temperature 212.0 is the same as 100.00 degrees celsius.
Process finished with exit code 0
```

```
"C:\Program Files\Java\jdk-16.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.1\lib\idea_rt.jar=1037:C:\Program F
K Bhavani Venkata Karthik 2019503511
Enter the Fahrenheit temperature:
0.555
Fahreheit temperature 0.555 is the same as -17.47 degrees celsius.
Process finished with exit code 0
```

2. Write a program that takes as input three numbers, u, a, and t. Here u stands for the initial velocity, a stands for the acceleration, and t stands for the time duration. The program prints the final velocity (v).v=u+at Recall that u and a can take any real (float) values as velocity and
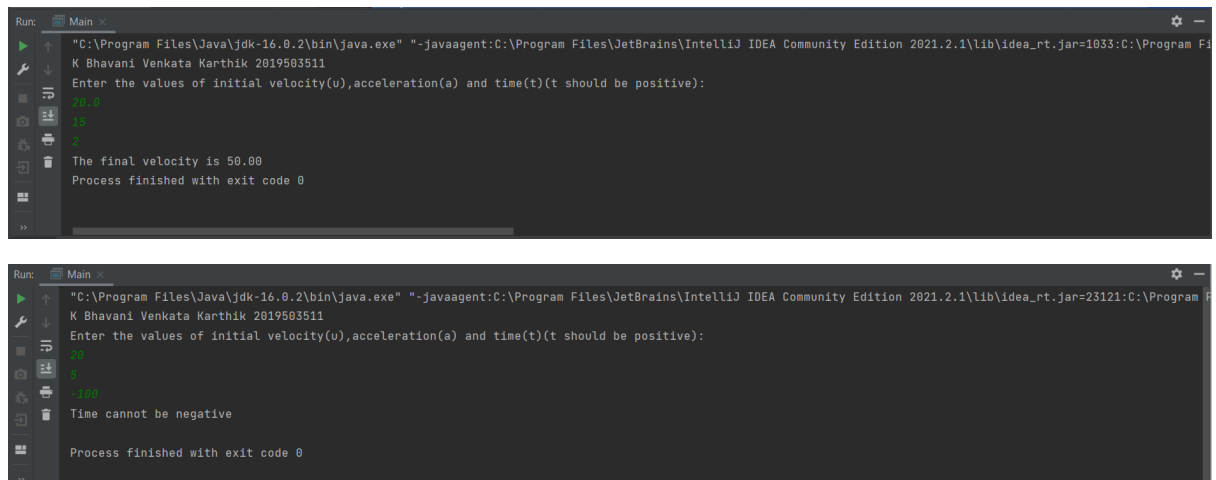
acceleration are continuous vector quantities (in physics). Time t can take non-negative real values only, i.e., 0 ≤ t. Note:round your answer to up to two decimal places.

Source Code

```java
package com.company;
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner in=new Scanner(System.in);
        System.out.println("K Bhavani Venkata Karthik 2019503511");
        System.out.println("Enter the values of initial
velocity(u),acceleration(a) and time(t)(t should be positive):");
        float u=in.nextFloat();
        float a=in.nextFloat();
        float t=in.nextFloat();
        if(t>0) {
            double v = u + (a * t);
            System.out.printf("The final velocity is %.2f", v);
        }
        else
            System.out.println("Time cannot be negative");
    }
}
```

Output

3. Write a program that takes as input three numbers, u, a, and t. Here u stands for the initial velocity, a stands for the acceleration, and t stands for the time duration. The program prints the displacement covered (d) in time t.Recall that u and a can take any real value as velocity and acceleration are continuous vectors (in physics). Time t can take non-negative real values only, i.e., 0 ≤ t.
NOTE:round your answer to up to two decimal places.
1.The formula for computing the displacement: $d = ut + 12at^2$
Source Code

```java
package com.company;
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner in=new Scanner(System.in);
        System.out.println("K Bhavani Venkata Karthik 2019503511");
        System.out.println("Enter the values of initial
velocity(u),acceleration(a) and time(t)(Time should be positive):");
        float u=in.nextFloat();
        float a=in.nextFloat();
        float t=in.nextFloat();
        if(t>0) {
            double d = (u * t) + 1.0 / 2.0 * (a * (t * t));
            System.out.printf("The final displacement is %.2f", d);
        }
        else
            System.out.println("Time cannot be negative");
    }
}
```

Output

4. Write a program that takes as input an Integer s, the number of seconds elapsed for a certain event. The program converts s to hours (hh), minutes (mm), and seconds (ss) and prints the output as hh:mm:ss.

Source Code

```java
package com.company;
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner in=new Scanner(System.in);
        System.out.println("K Bhavani Venkata Karthik 2019503511");
        System.out.println("Enter the number of seconds:");
        int sec=in.nextInt();
        int h=sec/3600;
        sec=sec%3600;
        int m=sec/60;
        sec=sec%60;
        int s=sec;
        System.out.printf("%d:%d:%d",h,m,s);
    }
}
```

Output

```
"C:\Program Files\Java\jdk-16.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.1\lib\idea_rt.jar=17573:C:\Program F
K Bhavani Venkata Karthik 2019503511
Enter the number of seconds:
5
0:0:5
Process finished with exit code 0
```
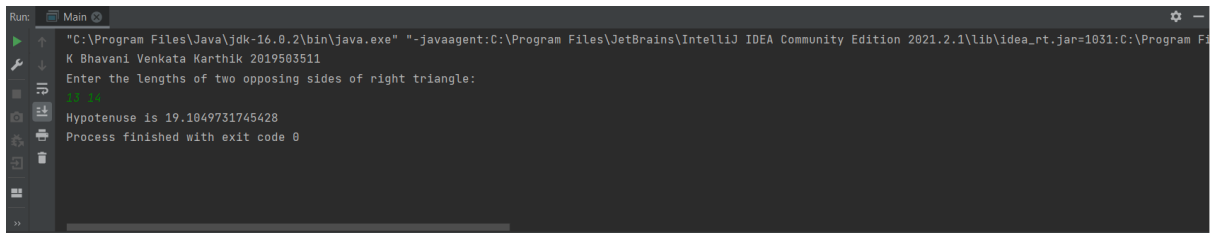


```
"C:\Program Files\Java\jdk-16.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.1\lib\idea_rt.jar=17584:C:\Program F
K Bhavani Venkata Karthik 2019503511
Enter the number of seconds:
67
0:1:7
Process finished with exit code 0
```



```
"C:\Program Files\Java\jdk-16.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.1\lib\idea_rt.jar=17588:C:\Program
K Bhavani Venkata Karthik 2019503511
Enter the number of seconds:
9000
2:30:0
Process finished with exit code 0
```

Sample Programs

1. Find the hypotenuse of a right triangle given the lengths of its two opposing sides.

Source Code

```java
package com.company;
import java.util.Scanner;
public class Main{
    public static void main(String[] args)
    {
        Scanner in=new Scanner(System.in);
        System.out.println("K Bhavani Venkata Karthik 2019503511");
        System.out.println("Enter the lengths of two opposing sides of
right triangle: ");
        double a=in.nextDouble();
        double b=in.nextDouble();
        double c=Math.sqrt(a*a + b*b);
        System.out.printf("Hypotenuse is " + c);
    }
}
```
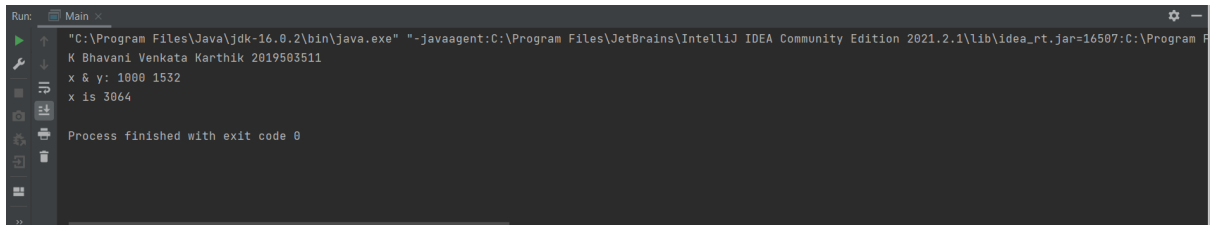
Output

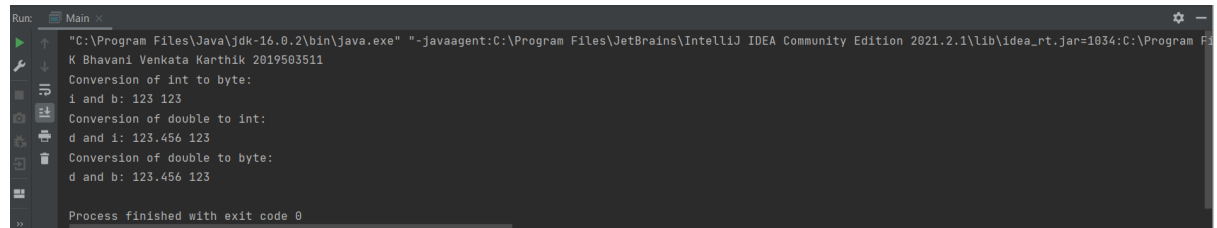2. Demonstrate block scope
Source Code

```java
package com.company;
public class Main {
    public static void main(String[] args) {
        System.out.println("K Bhavani Venkata Karthik 2019503511");
        int x = 1000;
        if(x == 1000){
            int y = 1532;
            System.out.println("x & y: " + x + " " + y);
            x = y * 2;
        }
        int y = 2547;
        System.out.println("x is " + x);
    }
}
```

Output

3. Casting Incompatible Types

Source Code

```java
package com.company;
public class Main {
    public static void main(String[] args)
    {
        System.out.println("K Bhavani Venkata Karthik 2019503511");
        byte b;
        int i = 123;
        double d = 123.456;
        System.out.println("Conversion of int to byte: ");
        b = (byte) i;
```

```java
        System.out.println("i and b: " + i + " " + b);
        System.out.println("Conversion of double to int: ");
        i = (int) d;
        System.out.println("d and i: " + d + " " + i);
        System.out.println("Conversion of double to byte: ");
        b = (byte) d;
        System.out.println("d and b: " + d + " " + b);
    }
}
```

Output

4. Manually allocate differing size second dimension and print the following pattern:
   0
   1 2
   3 4 5
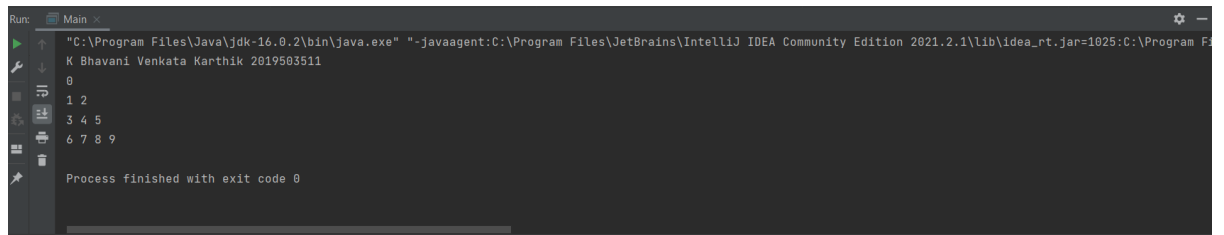   6 7 8 9

   Source Code

```java
package com.company;
public class Main {
    public static void main(String[] args)
    {
        System.out.println("K Bhavani Venkata Karthik 2019503511");
        int[][] arr = new int[4][];
        arr[0] = new int[1];
        arr[1] = new int[2];
        arr[2] = new int[3];
        arr[3] = new int[4];
        int i,j,k=0;
        for(i=0;i<4;i++)
        {
            for(j=0;j<i+1;j++)
            {
                arr[i][j] = k;
                k++;
            }
        }
        for(i=0;i<4;i++)
        {
            for(j=0;j<i+1;j++)
            {
                System.out.print(arr[i][j] + " ");
            }
            System.out.println();
        }
```
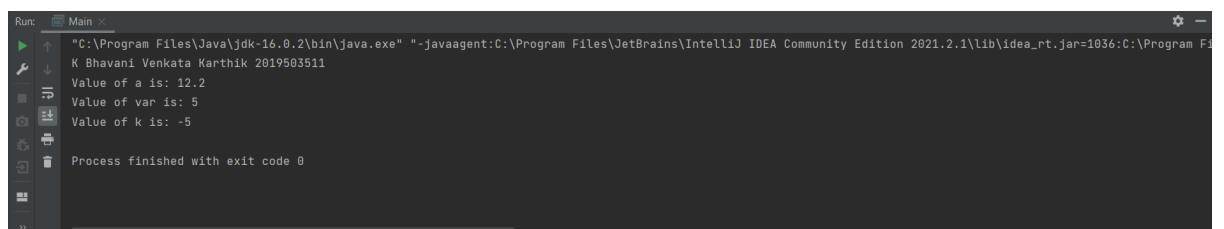
```
        }
}
```

Output

5. Introducing type inference with local variables:

Source Code

```java
package com.company;
public class Main {
    public static void main(String[] args){
        System.out.println("K Bhavani Venkata Karthik 2019503511");
        var a = 12.2;
        System.out.println("Value of a is: " + a);
        int var = 5;
        System.out.println("Value of var is: " + var);
        var k = -var;
        System.out.println("Value of k is: " + k);
    }
}
```

Output