Arnav Agrawal Lab 1 and Lab 2- 200905200

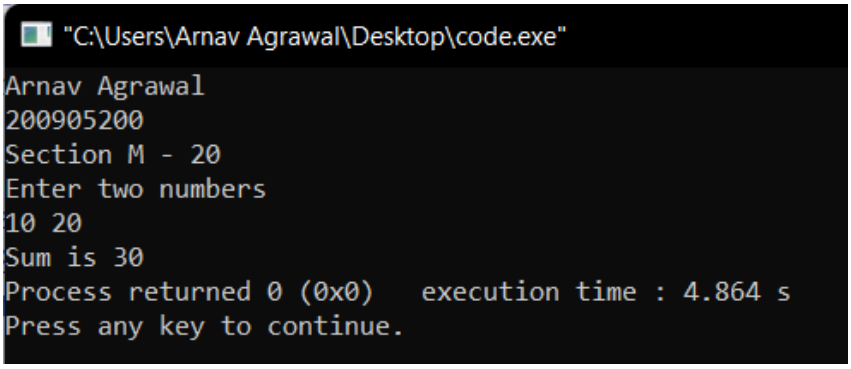
Lab 1

Question 1

Write a C program to add two integers a and b read through the keyboard. Display the result using third variable sum.

```
// Arnav Agrawal
// 200905200
// Lab 1
// Question 1
// Write a C program to add two integers a and b read through the keyboard. Display the
// result using third variable sum
#include<stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a;
    int b;
    int sum;
    printf("Enter two numbers\n");
    scanf("%d%d",&a,&b);
    sum=a+b;
    printf("Sum is %d",sum);
    return 0;
}
```

```
1  // Arnav Agrawal
2  // 200905200
3  // Lab 1
4  // Question 1
5  // Write a C program to add two integers a and b read through the keyboard. Display the
6  // result using third variable sum
7  #include<stdio.h>
8  int main()
9  {
10     printf("Arnav Agrawal\n");
11     printf("200905200\n");
12     printf("Section M - 20\n");
13     int a;
14     int b;
15     int sum;
16     printf("Enter two numbers\n");
17     scanf("%d%d",&a,&b);
18     sum=a+b;
19     printf("Sum is %d",sum);
20     return 0;
21 }
```



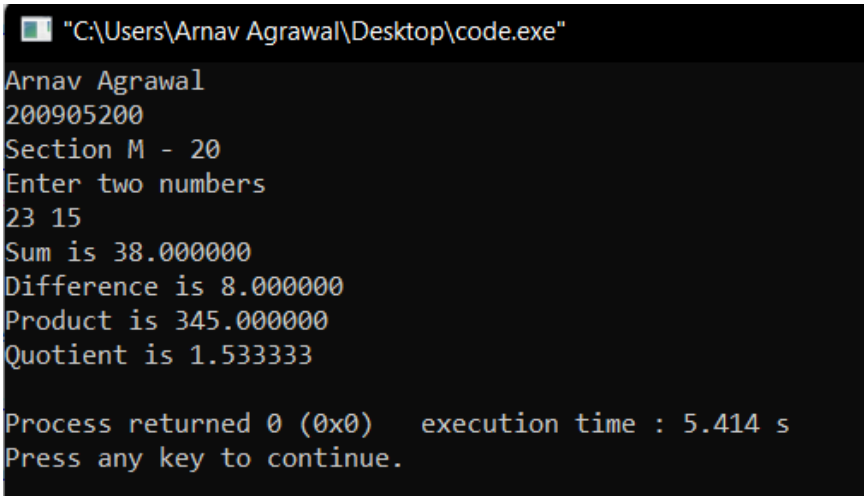
Question 2

Write a C program to find the sum, difference, product and quotient of 2 numbers.

```
// Arnav Agrawal
// 200905200
// Lab 1
// Question 2
// Write a C program to find the sum, difference, product and quotient of 2 numbers
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    float a;
    float b;
    float c;
    printf("Enter two numbers\n");
    scanf("%f%f", &a, &b);
    c = a + b;
    printf("Sum is %f\n", c);
    c = a - b;
    printf("Difference is %f \n", c);
    c = a * b;
    printf("Product is %f\n", c);
    c = a / b;
    printf("Quotient is %f\n", c);
    return 0;
}
```

```c
// Arnav Agrawal
// 200905200
// Lab 1
// Question 2
// Write a C program to find the sum, difference, product and quotient of 2 numbers
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    float a;
    float b;
    float c;
    printf("Enter two numbers\n");
    scanf("%f%f", &a, &b);
    c = a + b;
    printf("Sum is %f\n", c);
    c = a - b;
    printf("Difference is %f \n", c);
    c = a * b;
    printf("Product is %f\n", c);
    c = a / b;
    printf("Quotient is %f\n", c);
    return 0;
}

```



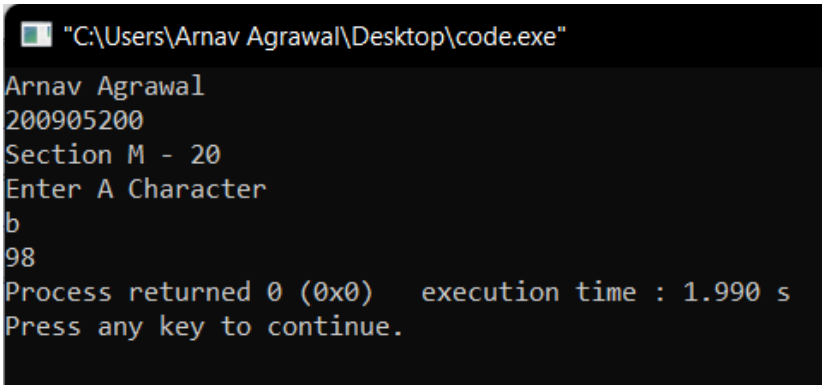
Question 3

Write a C program to print the ASCII value of a character

```c
// Arnav Agrawal
// 200905200
// Lab 1
// Question 3
// Write a C program to print the ASCII value of a character
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
```

```
    printf("Enter A Character\n");
    char a;
    scanf("%c", &a);
    printf("%d", a);
    return 0;
}
```

```c
// Arnav Agrawal
// 200905200
// Lab 1
// Question 3
// Write a C program to print the ASCII value of a character
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    printf("Enter A Character\n");
    char a;
    scanf("%c", &a);
    printf("%d", a);
    return 0;
}
```



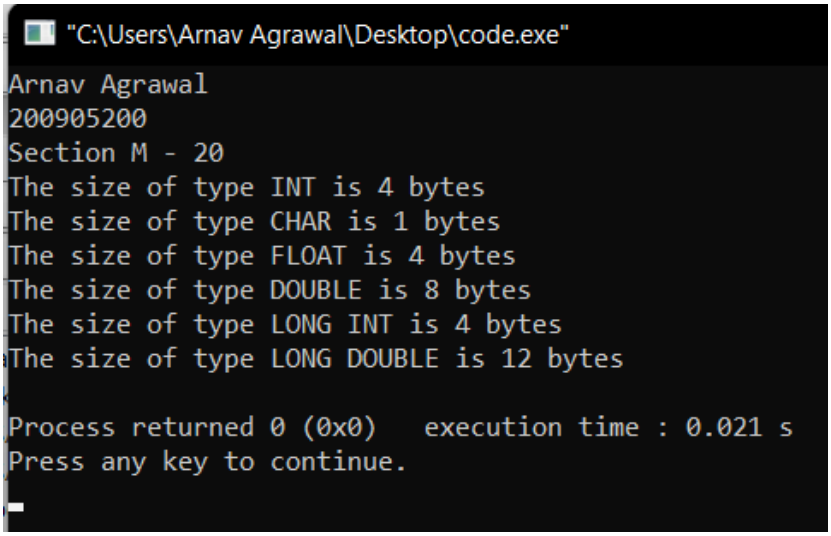
Question 4

Write a C program to display the size of the data type int, char, float, double, long int and long double using size of ( ) operator.

```c
// Arnav Agrawal
// 200905200
// Lab 1
// Question 4
// Write a C program to display the size of the data type int, char, float, double, long
// int and long double using size of ( ) operator.
#include <stdio.h>
int main()
```

```
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a;
    char b;
    float c;
    double d;
    long int e;
    long double f;
    printf("The size of type INT is %d bytes \n", sizeof(a));
    printf("The size of type CHAR is %d bytes \n", sizeof(b));
    printf("The size of type FLOAT is %d bytes \n", sizeof(c));
    printf("The size of type DOUBLE is %d bytes \n", sizeof(d));
    printf("The size of type LONG INT is %d bytes \n", sizeof(e));
    printf("The size of type LONG DOUBLE is %d bytes \n", sizeof(f));
    return 0;
}
```

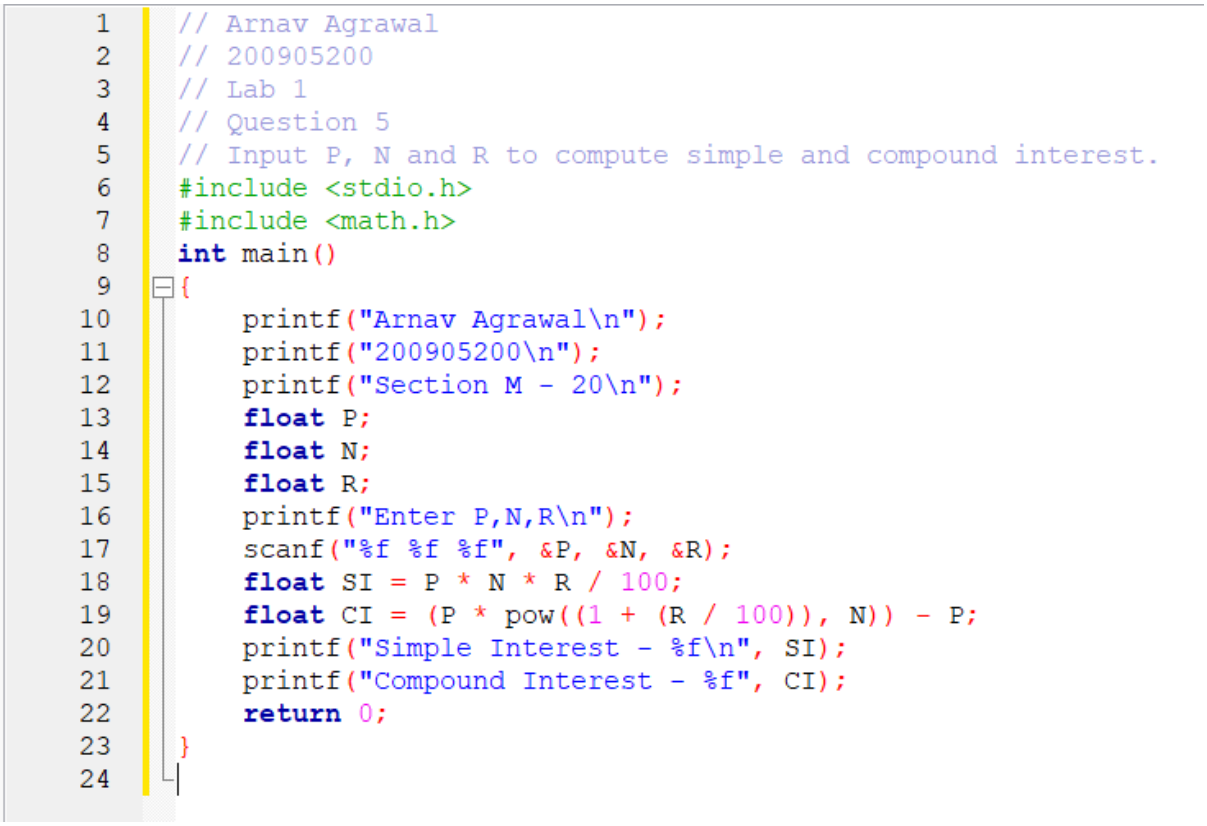
```c
// Arnav Agrawal
// 200905200
// Lab 1
// Question 4
// Write a C program to display the size of the data type int, char, float, double, long
// int and long double using size of ( ) operator.
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a;
    char b;
    float c;
    double d;
    long int e;
    long double f;
    printf("The size of type INT is %d bytes \n", sizeof(a));
    printf("The size of type CHAR is %d bytes \n", sizeof(b));
    printf("The size of type FLOAT is %d bytes \n", sizeof(c));
    printf("The size of type DOUBLE is %d bytes \n", sizeof(d));
    printf("The size of type LONG INT is %d bytes \n", sizeof(e));
    printf("The size of type LONG DOUBLE is %d bytes \n", sizeof(f));
    return 0;
}
```



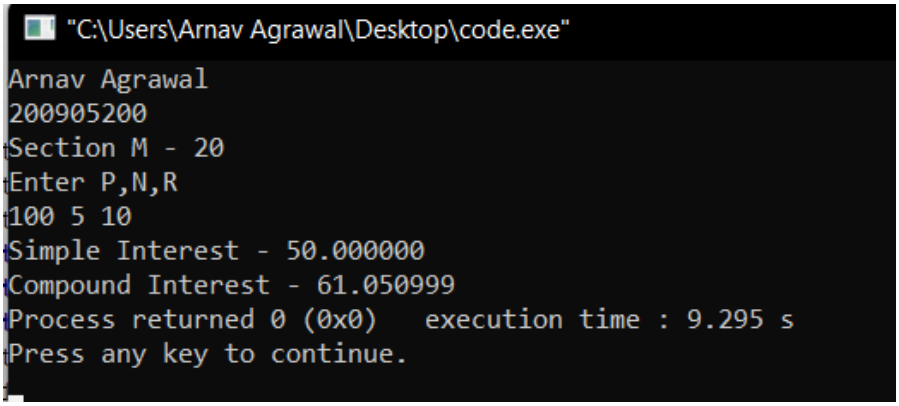
Question 5

Input P, N and R to compute simple and compound interest. [Hint: SI = PNR/100, CI = P(1+R/100)N-P]

```
// Arnav Agrawal
// 200905200
// Lab 1
// Question 5
// Input P, N and R to compute simple and compound interest.
#include <stdio.h>
#include <math.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    float P;
    float N;
    float R;
    printf("Enter P,N,R\n");
    scanf("%f %f %f", &P, &N, &R);
    float SI = P * N * R / 100;
    float CI = (P * pow((1 + (R / 100)), N)) - P;
    printf("Simple Interet - %f\n", SI);
    printf("Compound Interest - %f", CI);
    return 0;
}
```



```
1  // Arnav Agrawal
2  // 200905200
3  // Lab 1
4  // Question 5
5  // Input P, N and R to compute simple and compound interest.
6  #include <stdio.h>
7  #include <math.h>
8  int main()
9  {
10     printf("Arnav Agrawal\n");
11     printf("200905200\n");
12     printf("Section M - 20\n");
13     float P;
14     float N;
15     float R;
16     printf("Enter P,N,R\n");
17     scanf("%f %f %f", &P, &N, &R);
18     float SI = P * N * R / 100;
19     float CI = (P * pow((1 + (R / 100)), N)) - P;
20     printf("Simple Interest - %f\n", SI);
21     printf("Compound Interest - %f", CI);
22     return 0;
23 }
24
```

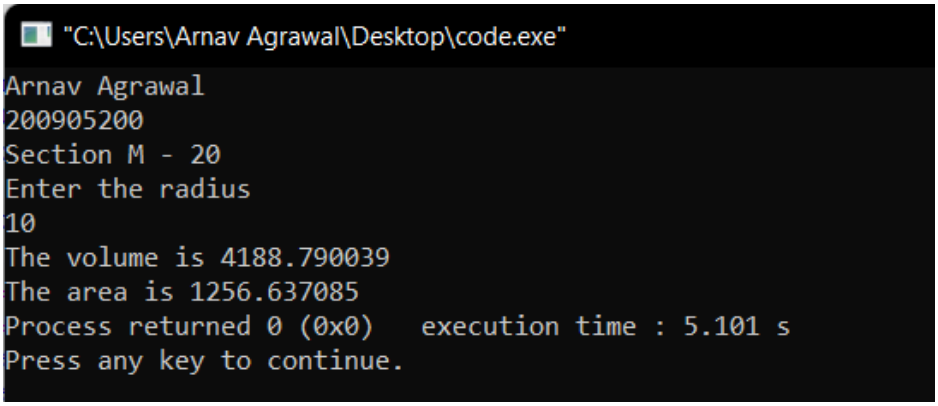


Question 6

Input radius to find the volume and surface area of a sphere. [Hint: volume = (4πr3)/3, Area=4πr2]

```
// Arnav Agrawal
// 200905200
// Lab 1
// Question 6
// Input radius to find the volume and surface area of a sphere.
#define PI 3.141592654
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    float r;
    printf("Enter the radius\n");
    scanf("%f", &r);
    float v = 4 * PI * r * r * r / 3;
    float a = 4 * r * r * PI;
    printf("The volume is %f\n", v);
    printf("The area is %f", a);
    return 0;
}
```

```c
// Arnav Agrawal
// 200905200
// Lab 1
// Question 6
// Input radius to find the volume and surface area of a sphere.
#define PI 3.141592654
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    float r;
    printf("Enter the radius\n");
    scanf("%f", &r);
    float v = 4 * PI * r * r * r / 3;
    float a = 4 * r * r * PI;
    printf("The volume is %f\n", v);
    printf("The area is %f", a);
    return 0;
}
```



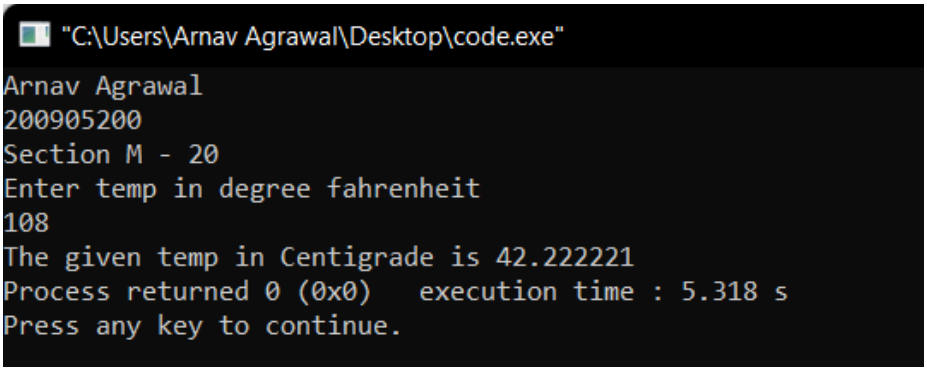
Question 7

Convert the given temperature in Fahrenheit to Centigrade. [Hint: C=5/9(F-32)]

```c
// Arnav Agrawal
// 200905200
// Lab 1
// Question 7
// Convert the given temperature in Fahrenheit to Centigrade.
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    float F;
    printf("Enter temp in degree fahrenheit\n");
    scanf("%f", &F);
    float C = (F - 32) * 5 / 9;
    printf("The given temp in Centigrade is %f", C);
```

```
    return 0;
}
```

```
1  // Arnav Agrawal
2  // 200905200
3  // Lab 1
4  // Question 7
5  // Convert the given temperature in Fahrenheit to Centigrade.
6  #include <stdio.h>
7  int main()
8  {
9      printf("Arnav Agrawal\n");
10     printf("200905200\n");
11     printf("Section M - 20\n");
12     float F;
13     printf("Enter temp in degree fahrenheit\n");
14     scanf("%f", &F);
15     float C = (F - 32) * 5 / 9;
16     printf("The given temp in Centigrade is %f", C);
17     return 0;
18 }
19
```



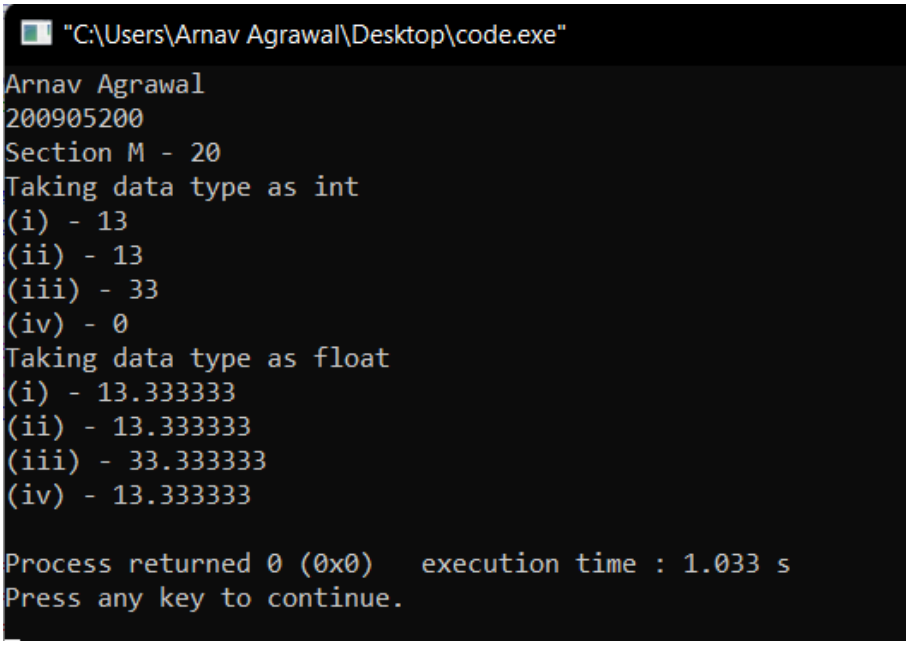
Question 8

Write a C program to evaluate the following expression for the values a = 30,
b=10, c=5, d=15
(i) (a + b) * c / d (ii) ((a + b) * c) / d
(iii) a + (b * c) / d (iv) (a + b) * (c / d)

```
// Arnav Agrawal
// 200905200
// Lab 1
// Question 8
// Write a C program to evaluate the following expression for the values a = 30,
// b=10, c=5, d=15
#include<stdio.h>
int main()
```

```
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a = 30;
    int b = 10;
    int c = 5;
    int d = 15;
    printf("Taking data type as int\n");
    printf("(i) - %d \n", (a + b) * c / d);
    printf("(ii) - %d \n", ((a + b) * c) / d);
    printf("(iii) - %d \n", a + (b * c) / d);
    printf("(iv) - %d \n", (a + b) * (c / d));
    float A = 30;
    float B = 10;
    float C = 5;
    float D = 15;
    printf("Taking data type as float\n");
    printf("(i) - %f \n", (A + B) * C / D);
    printf("(ii) - %f \n", ((A + B) * C) / D);
    printf("(iii) - %f \n", A + (B * C) / D);
    printf("(iv) - %f \n", (A + B) * (C / D));
    return 0;
}
```

```c
// Arnav Agrawal
// 200905200
// Lab 1
// Question 8
// Write a C program to evaluate the following expression for the values a = 30,
// b=10, c=5, d=15
#include<stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a = 30;
    int b = 10;
    int c = 5;
    int d = 15;
    printf("Taking data type as int\n");
    printf("(i) - %d \n", (a + b) * c / d);
    printf("(ii) - %d \n", ((a + b) * c) / d);
    printf("(iii) - %d \n", a + (b * c) / d);
    printf("(iv) - %d \n", (a + b) * (c / d));
    float A = 30;
    float B = 10;
    float C = 5;
    float D = 15;
    printf("Taking data type as float\n");
    printf("(i) - %f \n", (A + B) * C / D);
    printf("(ii) - %f \n", ((A + B) * C) / D);
    printf("(iii) - %f \n", A + (B * C) / D);
    printf("(iv) - %f \n", (A + B) * (C / D));
    return 0;
}
```



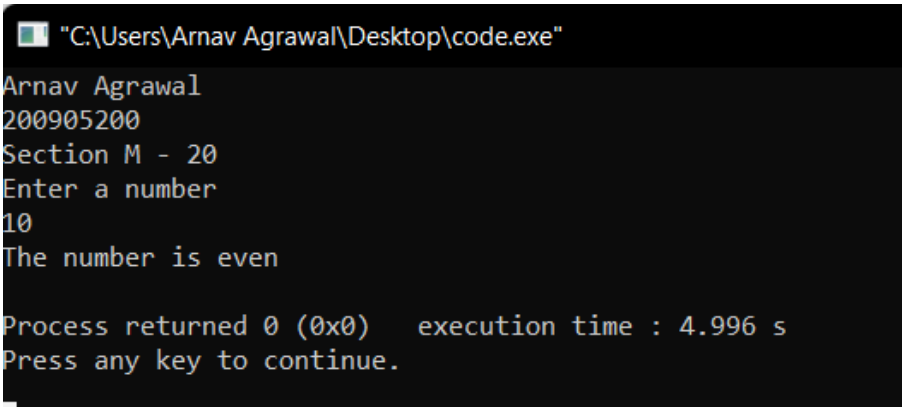
Lab 2

Question 1

Check whether the given number is odd or even

```
// Arnav Agrawal
// 200905200
// Lab 2
// Question 1
// Check whether the given number is odd or even
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a;
    printf("Enter a number\n");
    scanf("%d", &a);
    if (a % 2 == 0)
    {
        printf("The number is even\n");
    }
    else
    {
        printf("The number is odd\n");
    }
    return 0;
}
```

```c
// Arnav Agrawal
// 200905200
// Lab 2
// Question 1
// Check whether the given number is odd or even
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a;
    printf("Enter a number\n");
    scanf("%d", &a);
    if (a % 2 == 0)
    {
        printf("The number is even\n");
    }
    else
    {
        printf("The number is odd\n");
    }
    return 0;
}
```



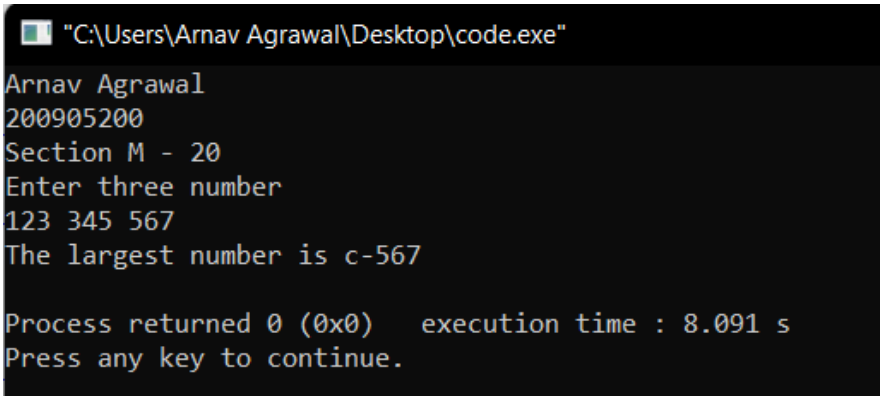
Question 2

Find the largest among given 3 numbers

```c
// Arnav Agrawal
// 200905200
// Lab 2
// Question 2
// Find the largest among given 3 numbers
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a, b, c;
    printf("Enter three number\n");
    scanf("%d %d %d", &a, &b, &c);
    if (a > b)
```

```
    {
        if (a > c)
        {
            printf("The largest number is a-%d\n", a);
        }
        else
        {
            printf("The largest number is c-%d\n", c);
        }
    }
    else
    {
        if (b > c)
        {
            printf("The largest number is b-%d\n", b);
        }
        else
        {
            printf("The largest number is c-%d\n", c);
        }
    }
    return 0;
}
```

```c
// Arnav Agrawal
// 200905200
// Lab 2
// Question 2
// Find the largest among given 3 numbers
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a, b, c;
    printf("Enter three number\n");
    scanf("%d %d %d", &a, &b, &c);
    if (a > b)
    {
        if (a > c)
        {
            printf("The largest number is a-%d\n", a);
        }
        else
        {
            printf("The largest number is c-%d\n", c);
        }
    }
    else
    {
        if (b > c)
        {
            printf("The largest number is b-%d\n", b);
        }
        else
        {
            printf("The largest number is c-%d\n", c);
        }
    }
    return 0;
}
```



Question 3

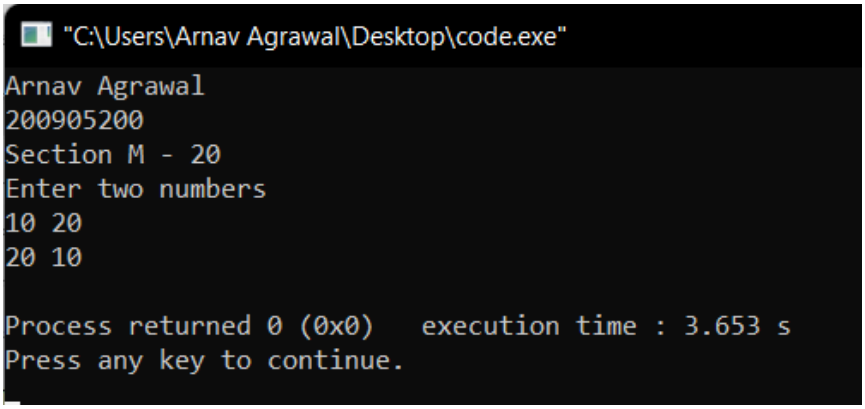
Swap two numbers without using third variable.

```
// Arnav Agrawal
// 200905200
// Lab 2
// Question 3
// Swap two numbers without using third variable.

#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a, b;
    printf("Enter two numbers\n");
    scanf("%d %d", &a, &b);
    a = a + b;
    b = a - b;
    a = a - b;
    printf("%d %d\n", a, b);
    return 0;
}
```

```c
// Arnav Agrawal
// 200905200
// Lab 2
// Question 3
// Swap two numbers without using third variable.

#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a, b;
    printf("Enter two numbers\n");
    scanf("%d %d", &a, &b);
    a = a + b;
    b = a - b;
    a = a - b;
    printf("%d %d\n", a, b);
    return 0;
}
```



Question 4

Compute all the roots of a quadratic equation using switch case statement.

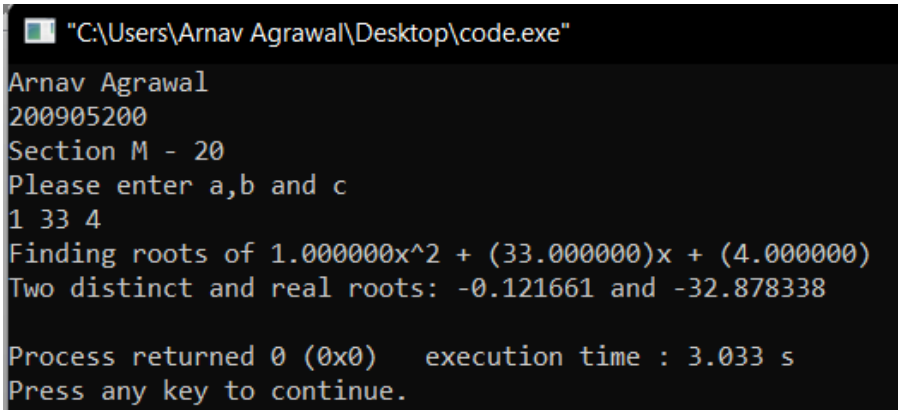
```c
// Arnav Agrawal
// 200905200
// Lab 2
// Question 4
// Compute all the roots of a quadratic equation using switch case statement.
#include <stdio.h>
#include <math.h>
int main()
{
```

```
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    float a;
    float b;
    float c;
    printf("Please enter a,b and c\n");
    scanf("%f %f %f", &a, &b, &c);
    printf("Finding roots of %fx^2 + (%f)x + (%f)\n", a, b, c);
    float d;  //discriminant
    float r1; //first root
    float r2;
    float imaginary;
    d = b * b - (4 * a * c);
    switch (d > 0)
    {
    case 1:
        r1 = (-b + sqrt(d)) / (2 * a);
        r2 = (-b - sqrt(d)) / (2 * a);
        printf("Two distinct and real roots: %f and %f\n", r1, r2);
        break;
    case 0:
        switch (d < 0)
        {
        case 1:
            r1 = r2 = -b / (2 * a);
            imaginary = sqrt(-d) / (2 * a);
            printf("Two distinct complex roots: %f + i%f and %f - i%f\n", r1, imaginary, r2, imaginary);
            break;
        case 0:
            r1 = r2 = -b / (2 * a);
            printf("Two equal and real roots: %f and %f\n", r1, r2);
            break;
        }
        break;
    }
    return 0;
}
```

```c
// Arnav Agrawal
// 200905200
// Lab 2
// Question 4
// Compute all the roots of a quadratic equation using switch case statement.
#include <stdio.h>
#include <math.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    float a;
    float b;
    float c;
    printf("Please enter a,b and c\n");
    scanf("%f %f %f", &a, &b, &c);
    printf("Finding roots of %fx^2 + (%f)x + (%f)\n", a, b, c);
    float d;  //discriminant
    float r1; //first root
    float r2;
    float imaginary;
    d = b * b - (4 * a * c);
    switch (d > 0)
    {
    case 1:
        r1 = (-b + sqrt(d)) / (2 * a);
        r2 = (-b - sqrt(d)) / (2 * a);
        printf("Two distinct and real roots: %f and %f\n", r1, r2);
        break;
    case 0:
        switch (d < 0)
        {
        case 1:
            r1 = r2 = -b / (2 * a);
            imaginary = sqrt(-d) / (2 * a);
            printf("Two distinct complex roots: %f + i%f and %f - i%f\n", r1, imaginary, r2, imaginary);
            break;
        case 0:
            r1 = r2 = -b / (2 * a);
            printf("Two equal and real roots: %f and %f\n", r1, r2);
            break;
        }
        break;
    }
    return 0;
}
```

```
"C:\Users\Arnav Agrawal\Desktop\code.exe"
Arnav Agrawal
200905200
Section M - 20
Please enter a,b and c
1 2 1
Finding roots of 1.000000x^2 + (2.000000)x + (1.000000)
Two equal and real roots: -1.000000 and -1.000000

Process returned 0 (0x0)   execution time : 7.238 s
Press any key to continue.
```

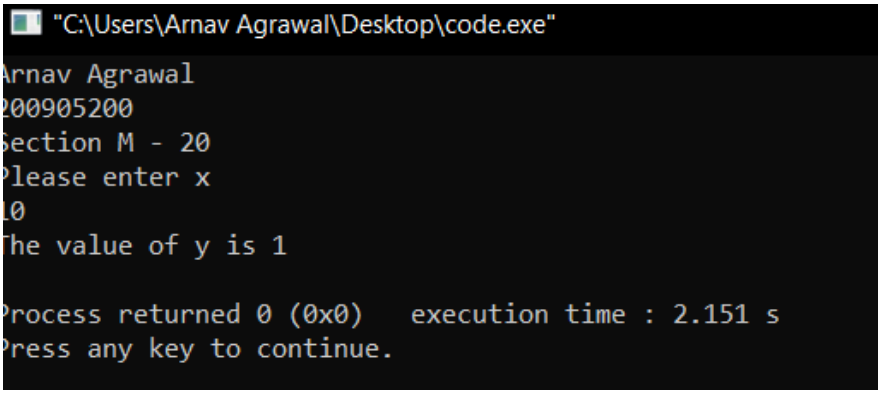


Question 5

Write a program that will read the value of x and evaluate the following function

```
// Arnav Agrawal
// 200905200
// Lab 2
// Question 5
// Write a program that will read the value of x and evaluate the following function
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    float x;
    printf("Please enter x\n");
    scanf("%f", &x);
    if (x > 0)
    {
        int y = 1;
        printf("The value of y is %d \n", y);
    }
    else if (x == 0)
    {
        int y = 0;
        printf("The value of y is %d \n", y);
    }
    else
    {
        int y = -1;
        printf("The value of y is %d \n", y);
    }
}
```

```c
// Arnav Agrawal
// 200905200
// Lab 2
// Question 5
// Write a program that will read the value of x and evaluate the following function
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    float x;
    printf("Please enter x\n");
    scanf("%f", &x);
    if (x > 0)
    {
        int y = 1;
        printf("The value of y is %d \n", y);
    }
    else if (x == 0)
    {
        int y = 0;
        printf("The value of y is %d \n", y);
    }
    else
    {
        int y = -1;
        printf("The value of y is %d \n", y);
    }
}
```



Question 6

Find the smallest among three numbers using conditional operator

```c
// Arnav Agrawal
// 200905200
// Lab 2
// Question 6
// Find the smallest among three numbers using conditional operator.
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a, b, c;
    printf("Enter a,b and c\n");
    scanf("%d %d %d", &a, &b, &c);
    int min;
    min = (a < b) ? ((a < c) ? a : c) : ((b < c) ? b : c);
    printf("The smallest number is %d\n", min);
```

```
    return 0;
}
```

```c
// Arnav Agrawal
// 200905200
// Lab 2
// Question 6
// Find the smallest among three numbers using conditional operator.
#include <stdio.h>
int main()
{
    printf("Arnav Agrawal\n");
    printf("200905200\n");
    printf("Section M - 20\n");
    int a, b, c;
    printf("Enter a,b and c\n");
    scanf("%d %d %d", &a, &b, &c);
    int min;
    min = (a < b) ? ((a < c) ? a : c) : ((b < c) ? b : c);
    printf("The smallest number is %d\n", min);
    return 0;
}
```