Tutorial 3

Questions - PYQs

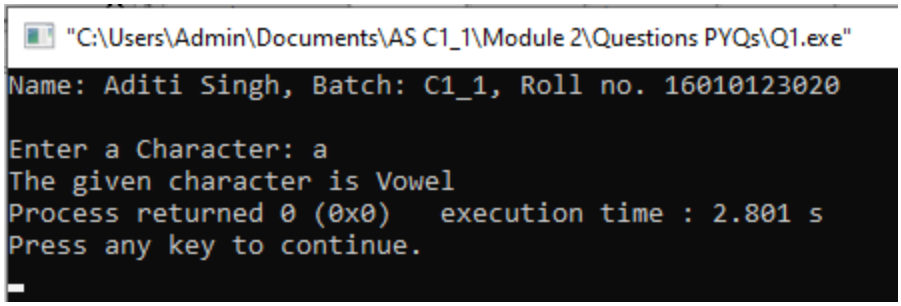
Name: Aditi Singh
Class: C1_1
Roll **no.:** 16010123020

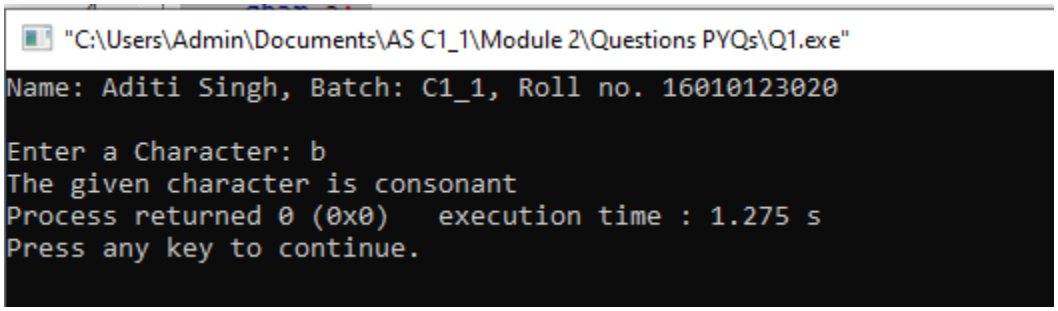
Q1

a) Write a program to find whether a given character is a Vowel or consonant. A character is taken as input. The character may be in Upper Case or in Lower Case.

Test case 1: Enter a Character : a or A Output : The given character is Vowel	Test case 2: Enter a Character : b or B Output : The given character is consonant

```
#include<stdio.h>
int main()
{
    char a;
    printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020
\n\n");
    printf("Enter a Character: ");
    scanf("%c",&a);
    if
(a=='a'||a=='A'||a=='e'||a=='E'||a=='i'||a=='I'||a=='o'||a=='O'||a=='u
'||a=='U')
    {
        printf("The given character is Vowel");
    }
    else
    {
        printf("The given character is consonant");
    }
    return 0;
}
```





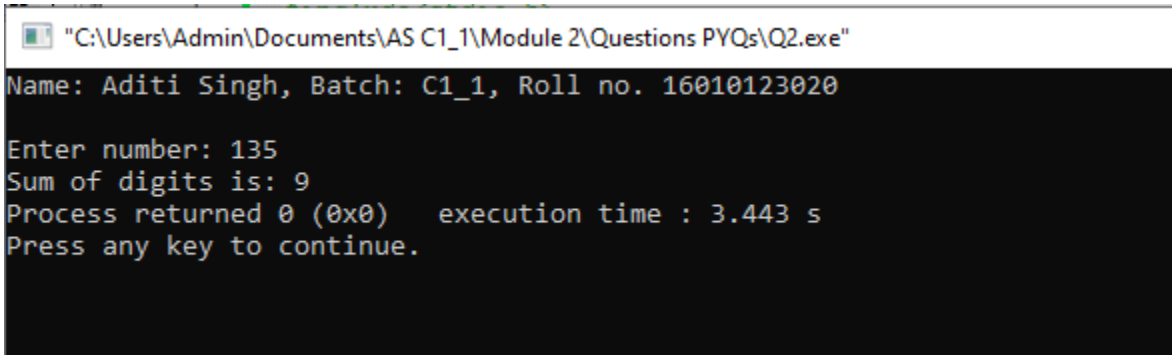
Q2

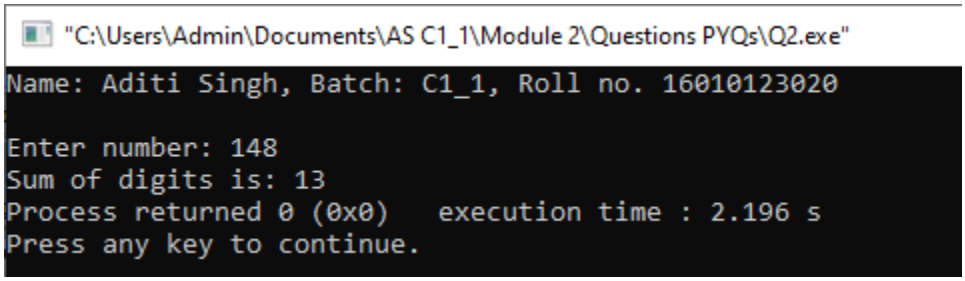
b) Write a program to enter a number and then calculate the sum of its digits

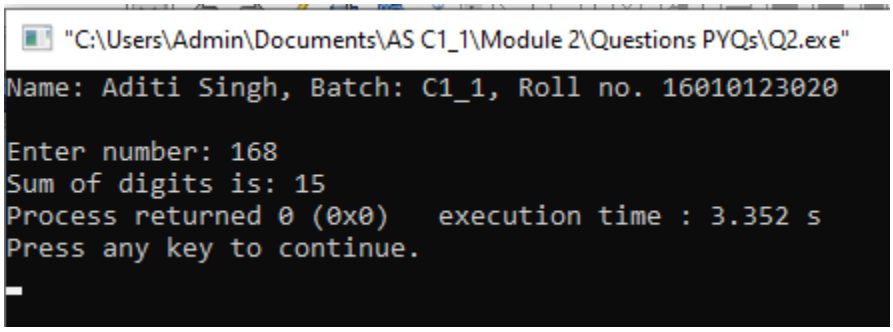
Test Case 1:	Test Case 2:
Enter a Number: 123	Enter a Number:2231
Output: 6	Output: 8

```
#include<stdio.h>
int main()
{
    int a,n;
    printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020
\n\n");
    printf("Enter number: ");
    scanf("%d",&a);
    n=0;
    while (a>0)
    {
        n=n+a%10;
        a=a/10;
    }

    printf("Sum of digits is: %d",n);
    return 0;
}
```







Q3

b) Write a menu driven program to choose one of the following tasks (Use switch case)

1. Find factors of a given number
2. Separate digits in a given number

Test Case 1:	**Test Case 2:**	**Test Case 3:**
Input number : 255 Choice of User : 1 Expected Output: 1. Factors = 3 X 5 X 17	Input number: 187 Choice of user : 2 Expected Output: 2. Digits in a number are 1,8,7	Input number: 554 Choice of user : 1 Expected Output: 1. Factors = 2 X 277

```
#include <stdio.h>
int main()
{
  int i, j, num, isPrime,c,n,a;
```

```
printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");

printf("Input number: ");
scanf("%d", &num);
printf("1. Find factors of a given number \n");
printf("2. Separate digits in a given number \n");
scanf("%d",&c);
switch(c)
  {
    case 1:
      printf("All Prime Factors of %d are: \n", num);

        for(i=2; i<=num; i++)
        {
            if(num%i==0)
            {
                isPrime = 1;
                for(j=2; j<=i/2; j++)
                {
                    if(i%j==0)
                    {
                        isPrime = 0;
                        break;
                    }
                }
                if(isPrime==1)
                {
                    printf("%d x ", i);
                }
            }
        }
    case 2:
          while (num>0)
          {
            n=num%10;
            num=num/10;
            printf("%d,",n);
          }
```

```
    }
    return 0;
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Input number: 35
1. Find factors of a given number
2. Separate digits in a given number
1
All Prime Factors of 35 are:
5 x 7 x
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Input number: 35
1. Find factors of a given number
2. Separate digits in a given number
2
5,3,
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Input number: 4567
1. Find factors of a given number
2. Separate digits in a given number
2
7,6,5,4,
```

Q4

a) Write a C program to convert specified days into years, weeks and days.

Test Case 1:	Test Case 2:
Number of days : 1329 Expected Output : Years: 3 Weeks: 33 Days: 3	Number of days : 1200 Expected Output : Years: 3 Weeks: 15 Days: 0

```
#include <stdio.h>
int main() {
  int n, i, w, y;
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");
  printf("\nEnter number of days: ");
  scanf("%d", &n);
  i = n;
  y = i / 365;
  printf("\nyears: %d", y);
  i = i - (y * 365);
  w = i / 7;
  printf("\nweeks: %d", w);
  i = i - (w * 7);
  printf("\ndays: %d", i);
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


Enter number of days: 368

years: 1
weeks: 0
days: 3
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


Enter number of days: 1000

years: 2
weeks: 38
days: 4
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


Enter number of days: 1500

years: 4
weeks: 5
days: 5
```

Q5

b) Write a program to find whether the given number is an armstrong number or not
An **Armstrong number** of three digits is an integer such that the sum of the cubes of its digits is equal to the number itself. E.g. 153 = (1*1*1)+(5*5*5)+(3*3*3)

Test Case 1:	Test Case 2:	Test Case 2:
Enter a Number: 153 Output: Yes Number is Armstrong	Enter a Number: 130 Output: Number is not Armstrong	Enter a Number:407 Output: Yes Number is Armstrong

```
#include<stdio.h>
#include<math.h>
int main()
{
```

```
    int a=0,n,sum=0,count=0,d,finalnum;
    printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020
\n\n");
    printf("Enter number: ");
    scanf("%d",&n);
    d=n;
    finalnum=n;
        while (d>0)
        {
            d=d/10;
            count++;
        }
        while (n>0)
        {
            a=n%10;
            sum=sum+pow(a,count);
            n=n/10;
            printf("%d\n",sum);
        }
        if (sum==finalnum)
        {
            printf("Number is Armstrong");
        }
        else
        {
            printf("Number is not Armstrong");
        }
}
```

Q6

a) Write a C program to find whether a given year is a leap year or not.

Test Case 1:	**Test Case 2:**	**Test Case 3:**	**Test Case 4:**
Input: 2016	Input: 1900	Input: 1990	Input: 2000
Output:	Output:	Output:	Output:
Leap Year	Not a Leap Year	Not a Leap Year	Leap Year

```
#include <stdio.h>
int main() {
```

```
   int year;
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");

   printf("Enter year: ");
   scanf("%d", &year);

   if (year % 400 == 0) {
      printf("%d is a leap year", year);
   }

   else if (year % 100 == 0) {
      printf("%d is not a leap year", year);
   }

   else if (year % 4 == 0) {
      printf("%d is a leap year", year);
   }
   // all other years are not leap years
   else {
      printf("%d is not a leap year", year);
   }

   return 0;
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter year: 2016
2016 is a leap year
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter year: 2000
2000 is a leap year
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter year: 2001
2001 is not a leap year
```

Q7

b) Write a C program to accept a coordinate point in a XY coordinate system and determine in which quadrant/axis the coordinate point lies.

Test Case 1:	**Test Case 2:**	**Test Case 3:**	**Test Case 4:**
Input: 7,8 Output: First quadrant	Input: 0,0 Output: Origin	Input: -7, 0 Output: X-axis	Input: 7,-8 Output: Fourth quadrant

```
#include <stdio.h>

int main()
{
  int x, y;
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");
  printf("Enter the x-coordinate: ");
  scanf("%d", &x);

  printf("Enter the y-coordinate: ");
  scanf("%d", &y);

  if (x > 0 && y > 0)
```

```
  {
    printf("The point is in Quadrant I\n");
  }

  else if (x < 0 && y > 0)
  {
    printf("The point is in Quadrant II\n");
  }

  else if (x < 0 && y < 0)
  {
    printf("The point is in Quadrant III\n");
  }

  else if (x > 0 && y < 0)
  {
    printf("The point is in Quadrant IV\n");
  }

  else if (x == 0 && y == 0)
  {
    printf("The point is at the origin\n");
  }

  else if (x == 0)
  {
    printf("The point lies on the y-axis\n");
  }

  else
  {
    printf("The point lies on the x-axis\n");
  }
  return 0;
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter the x-coordinate: 1
Enter the y-coordinate: 2
The point is in Quadrant I
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter the x-coordinate: -1
Enter the y-coordinate: 2
The point is in Quadrant II
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter the x-coordinate: 2
Enter the y-coordinate: -3
The point is in Quadrant IV
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter the x-coordinate: 1
Enter the y-coordinate: 0
The point lies on the x-axis
```

Q8

b) Write a menu driven program in C
When 's' - to display the sum of n numbers.
When 'p'- to display the following pattern. Number of rows will be input taken from the user.

Test Case 1:	**Test Case 2:**	**Test Case 3:**
Input: choice = 's', n = 5 Output: sum =15	Input: choice = 'p', n = 4 Output: 1 12 123 1234	Input: choice = 'p', n = 3 Output: 1 12 123

```
# include<stdio.h>
int main()
{
  int num, sum,n,i,j, c;
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");

  printf("\n1.Print the sum of n numbers");
  printf("\n2.To display the pattern");
  printf("\nEnter choice: ");
  scanf("%d", &c);

  switch(c)
  {
  case 1:
  printf("Enter the number for summation:");
  scanf("%d", &num);

  for (int i = 1; i < num; ++i)
    {
      sum += num;
    }
  printf("Sum till %d: %d\n", num, sum);
  return 0;

  case 2:
  printf("Enter no. of rows: ");
  scanf("%d",&n);
```

```
  for(i=1;i<=n;i++)
  {
    for(j=1;j<=i;j++)
    {
    printf("%d",j);
    }
  printf("\n");
  }
  return 0;

  default:
    printf("Enter 1 or 2");
  }
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.Print the sum of n numbers
2.To display the pattern
Enter choice: 1
Enter the number for summation:5
Sum till 5: 15
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.Print the sum of n numbers
2.To display the pattern
Enter choice: 1
Enter the number for summation:10
Sum till 10: 80
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.Print the sum of n numbers
2.To display the pattern
Enter choice: 2
Enter no. of rows: 4
1
12
123
1234
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.Print the sum of n numbers
2.To display the pattern
Enter choice: 2
Enter no. of rows: 8
1
12
123
1234
12345
123456
1234567
12345678
```

Q9

b) Write menu driven c program(using switch case) to execute following
Case 1: Write c program to display following pattern (number of rows entered by user)
Case 2: Write a program to display all possible combinations of given 3 numbers.

Test Case 1:	Test Case 2:	Test Case 3:	Test Case 4:
Choice of User : 1 Number of rows : 4 Output: 1 2 4 3 6 9 4 8 12 16	Choice of User : 2 Enter three nos : 1,2,3 Output: 123,132,231,213,321,312	Choice of User : 2 Enter three nos : 4,8,6 Output: 486,468,648,684,846, 864	Choice of User : 1 Number of rows : 3 Output: 1 2 4 3 6 9

```
# include<stdio.h>
int main()
{
  int rows, num, c,i,j,k;
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");
  printf("\n1.To display possible pattern");
  printf("\n2.To display all possible combinations of a three digit
number");
  printf("\nEnter choice: ");
  scanf("%d", &c);
  switch(c)

  {
  case 1:
  {
  printf("Enter no. of rows: ");
  scanf("%d", &rows);

  for (int i = 1; i <= rows; ++i)
  {
    for (int j = 1; j <= i; ++j)
    {
    printf("%d ", i * j);
    }
  printf("\n");
  }
  return 0;
  }
  case 2:
    {
    int arr[3];
    printf("Enter the first number : ");
    scanf("%d", &arr[0]);
    printf("Enter the second number : ");
    scanf("%d", &arr[1]);
    printf("Enter the third number : ");
    scanf("%d", &arr[2]);
    for (i = 0; i < 3; i++)
```

```
    {
        for (j = 0; j < 3; j++)
        {
            for (k = 0; k < 3; k++)
            {
                if (i != j && j != k && k != i)
                {

                    printf("%d%d%d\n", arr[i], arr[j], arr[k]);
                }
            }
        }
    }
  return 0;
  }
    default:
    printf("Enter 1 or 2");
}
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.To display possible pattern
2.To display all possible combinations of a three digit number
Enter choice: 1
Enter no. of rows: 5
1
2 4
3 6 9
4 8 12 16
5 10 15 20 25
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.To display possible pattern
2.To display all possible combinations of a three digit number
Enter choice: 1
Enter no. of rows: 8
1
2 4
3 6 9
4 8 12 16
5 10 15 20 25
6 12 18 24 30 36
7 14 21 28 35 42 49
8 16 24 32 40 48 56 64
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.To display possible pattern
2.To display all possible combinations of a three digit number
Enter choice: 2
Enter the first number : 1
Enter the second number : 2
Enter the third number : 3
123
132
213
231
312
321
```

Q10

a) Write a C program to read an amount (integer value) and break the amount into the smallest possible number of bank notes.

Note: The possible banknotes are 100, 50, 20, 10, 5, 2 and 1.

Test Data :
Input the amount: 375

Expected Output:
There are:
3 Note(s) of 100.00
1 Note(s) of 50.00
1 Note(s) of 20.00
0 Note(s) of 10.00
1 Note(s) of 5.00
0 Note(s) of 2.00
0 Note(s) of 1.00

```
#include <stdio.h>
int main() {
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");
    int amt, total;
    printf("Input the amount: ");
    scanf("%d",&amt);

    total = (int)amt/100;
    printf("There are:\n");
    printf("%d Note(s) of 100.00\n", total);
    amt = amt-(total*100);

    total = (int)amt/50;
    printf("%d Note(s) of 50.00\n", total);
    amt = amt-(total*50);

    total = (int)amt/20;
    printf("%d Note(s) of 20.00\n", total);
    amt = amt-(total*20);

    total = (int)amt/10;
    printf("%d Note(s) of 10.00\n", total);
    amt = amt-(total*10);
```

```
    total = (int)amt/5;
    printf("%d Note(s) of 5.00\n", total);
    amt = amt-(total*5);

    total = (int)amt/2;
    printf("%d Note(s) of 2.00\n", total);
    amt = amt-(total*2);

    total = (int)amt/1;
    printf("%d Note(s) of 1.00\n", total);

    return 0;
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Input the amount: 3782
There are:
37 Note(s) of 100.00
1 Note(s) of 50.00
1 Note(s) of 20.00
1 Note(s) of 10.00
0 Note(s) of 5.00
1 Note(s) of 2.00
0 Note(s) of 1.00
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Input the amount: 26702
There are:
267 Note(s) of 100.00
0 Note(s) of 50.00
0 Note(s) of 20.00
0 Note(s) of 10.00
0 Note(s) of 5.00
1 Note(s) of 2.00
0 Note(s) of 1.00
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Input the amount: 4863
There are:
48 Note(s) of 100.00
1 Note(s) of 50.00
0 Note(s) of 20.00
1 Note(s) of 10.00
0 Note(s) of 5.00
1 Note(s) of 2.00
1 Note(s) of 1.00
```

Q11

a) For a certain electrical circuit with an inductance L and resistance R,the damped natural frequency is given by

$$\text{Frequency}=\sqrt{\frac{\frac{1}{LC}-R^2}{4C^2}}$$

It is desired to study the variation of this frequency with Capacitance C. Write a C program to calculate the frequency for different values of Capacitance C starting from 0.10 to 0.50. (interval is 0.10).

Test Case 1: Enter L, Resistance, Capacitance 0.004, 1, 0.10 The Frequency is : 249.949995	Test Case 2: Enter L, Resistance, Capacitance 0.004,1,0.20 The Frequency is : 88.352985	Test Case 3: Enter L, Resistance, Capacitance 0.004,1,0.30 The Frequency is : 48.083646	Test Case 4: Enter L, Resistance, Capacitance 0.004,1,0.40 The Frequency is 31.224990	Test Case 5: Enter L, Resistance, Capacitance 0.004,1,0.50 The Frequency is : 22.338308

```
#include<stdio.h>
int main()
{
float l,r,c,f,t1,t2,t3;
printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");
  printf("Enter inductance l: ");
  scanf("%f",&l);
  printf("Enter capacitance c: ");
  scanf("%f",&c);
  printf("Enter resistance r: ");
  scanf("%f",&r);
  t1=1/(l*c);
  t2=pow(r,2);
  t3=pow(c,2);
  f= sqrt((t1+t2)/(4*t3));
  printf("Frequency is %f",f);
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter inductance l: 2
Enter capacitance c: 3
Enter resistance r: 4
Frequency is 0.670130
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter inductance l: 5
Enter capacitance c: 6
Enter resistance r: 7
Frequency is 0.583532
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter inductance l: 5
Enter capacitance c: 6
Enter resistance r: 7
Frequency is 0.583532
```

Q12

b) Write a program in C to check whether the quadrilateral is square, rectangle, parallelogram or rhombus . (Sides and diagonal will be entered by user)

Test Case 1:	**Test Case 2:**	**Test Case 3:**	**Test Case 3:**
Input: s1 = 3 ,s2 = 3, s3 = 3, s4 = 3, d1 = 4.24, d2 = 4.24	Input: s1 = 3 ,s2 = 3, s3 = 3, s4 = 3, d1 = 4, d2 = 5	Input: s1 = 3 ,s2 = 4, s3 = 3, s4 = 4, d1 = 5, d2 = 5	Input: s1 = 3 ,s2 = 4, s3 = 3, s4 = 4, d1 = 5, d2 = 6
Output: The quadrilateral is square.	Output: The quadrilateral is rhombus.	Output: The quadrilateral is rectangle.	Output: The quadrilateral is parallelogram.

```
#include <stdio.h>
int main() {
  int s1,s2,s3,s4,s5,d1,d2;
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");
  printf("Enter length of side 1: ");
```

```
  scanf("%d",&s1);
  printf("Enter length of side 2: ");
  scanf("%d",&s2);
  printf("Enter length of side 3: ");
  scanf("%d",&s3);
  printf("Enter length of side 4: ");
  scanf("%d",&s4);
  printf("Enter length of diagonal 1: ");
  scanf("%d",&d1);
  printf("Enter length of diagonal 2: ");
  scanf("%d",&d2);
  if ((s1==s2 && s2==s3 && s3==s4 && s4==s1) && (d1==d2))
  {
    printf("It is a square");
  }
  else if ((s1==s2 && s2==s3 && s3==s4 && s4==s1) && (d1!=d2))
  {
    printf("It is a rhombus");
  }
  else if ((s1==s3 && s2==s4) && (d1==d2))
  {
    printf("It is a rectangle");
  }
  else if ((s1==s3 && s2==s4) && (d1!=d2))
  {
    printf("It is a parallelogram");
  }
  else{
    printf("It is a quadrilateral");
  }
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter length of side 1: 5
Enter length of side 2: 4
Enter length of side 3: 5
Enter length of side 4: 4
Enter length of diagonal 1: 6
Enter length of diagonal 2: 6
It is a rectangle
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter length of side 1: 5
Enter length of side 2: 5
Enter length of side 3: 5
Enter length of side 4: 5
Enter length of diagonal 1: 6
Enter length of diagonal 2: 6
It is a square
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter length of side 1: 5
Enter length of side 2: 5
Enter length of side 3: 5
Enter length of side 4: 5
Enter length of diagonal 1: 8
Enter length of diagonal 2: 6
It is a rhombus
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter length of side 1: 5
Enter length of side 2: 6
Enter length of side 3: 7
Enter length of side 4: 8
Enter length of diagonal 1: 9
Enter length of diagonal 2: 6
It is a quadrilateral
```

Q13

b) Write a menu driven program in C
When 's' - to display the n terms of harmonic series and their sum.
1 + 1/2 + 1/3 + 1/4 + 1/5 ... 1/n terms

Test Case 1: Input: n=6 Output: 1 + 1/2 + 1/3 + 1/4 + 1/5 + ⅙+ sum=2.45	Test Case 2: Input: n=4 Output: 1 + 1/2 + 1/3 + 1/4 + sum=2.08	Test Case 3: Input: n=5 Output: 1 + 1/2 + 1/3 + 1/4 + 1/5 + sum=2.28

When 'p'- to display the following pattern. Number of rows will be input taken from the user.

Test Case 1: Input: row = 4 Output: 1 0 1 1 0 1 0 1 0 1	**Test Case 2:** Input: row = 3 Output: 1 0 1 1 0 1	**Test Case 3:** Input: row = 5 Output: 1 0 1 1 0 1 0 1 0 1 1 0 1 0 1

Print appropriate message if user has not entered valid choice.

```
# include<stdio.h>
int main()
{
int rows, n, choice;
```

```
double harmonicSum = 0.0;
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");
printf("\n1.Print the sum of n numbers");
printf("\n2.To display the pattern");
printf("\nEnter choice: ");
scanf("%d", &choice);
switch(choice)
{
case 1:
  printf("Enter the number of terms for the harmonic series: ");
  scanf("%d", &n);
  for (int i = 1; i <= n; ++i)
    {
    harmonicSum += 1.0 / i;
    }

  printf("Sum of the harmonic series up to %d terms: %.6f\n", n,
harmonicSum);

  return 0;

case 2:
    printf("Enter the number of rows: ");
    scanf("%d", &rows);

    for (int i = 1; i <= rows; ++i) {
        int value = i % 2;
        for (int j = 1; j <= i; ++j) {
            printf("%d ", value);
            value = 1 - value;
        }
        printf("\n");
    }
  return 0;
}
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.Print the sum of n numbers
2.To display the pattern
Enter choice: 1
Enter the number of terms for the harmonic series: 10
Sum of the harmonic series up to 10 terms: 2.928968
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.Print the sum of n numbers
2.To display the pattern
Enter choice: 1
Enter the number of terms for the harmonic series: 6
Sum of the harmonic series up to 6 terms: 2.450000
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.Print the sum of n numbers
2.To display the pattern
Enter choice: 2
Enter the number of rows: 4
1
0 1
1 0 1
0 1 0 1
```

Q14

b) Write a program in C to check whether the triangle is equilateral, scalene, or isosceles. (Inputs for Sides will be entered by user)

Test Case 1:	**Test Case 2:**	**Test Case 3:**
Input: s1 = 3 ,s2 = 3, s3 = 3 Output: The triangle is equilateral.	Input: s1 = 3 ,s2 = 2, s3 = 3 Output: The triangle is isosceles.	Input: s1 = 3 ,s2 = 2, s3 = 4 Output: The triangle is scalene.

```
#include<stdio.h>
int main()
{
float s1,s2,s3;
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");
printf("Enter length of side 1: ");
scanf("%f",&s1);
printf("Enter length of side 1: ");
scanf("%f",&s2);
printf("Enter length of side 1: ");
scanf("%f",&s3);
if (s1==s2 && s2==s3 && s3==s1)
{
  printf("Equilateral Triangle");
}
else if (s1==s2 || s2==s3 || s3==s1)
{
  printf("Isosceles Triangle");
}
else
{
  printf("Scalene Triangle");
}
return 0;
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter length of side 1: 3
Enter length of side 1: 4
Enter length of side 1: 5
Scalene Triangle
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter length of side 1: 3
Enter length of side 1: 3
Enter length of side 1: 5
Isosceles Triangle
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020

Enter length of side 1: 3
Enter length of side 1: 3
Enter length of side 1: 3
Equilateral Triangle
```

Q15

b) Write Menu driven program in C

Task 1: Write a C program to display all Prime numbers between X1 and X2. Accept the value of X1 and X2 from the user.

Task 2: Write a program to display the following pattern. Number of rows will be input taken from the user.

Test Case 1:	**Test Case 2:**	**Test Case 3:**
Input: row = 4 Output: 1 2 2 3 3 3 4 4 4 4	Input: row = 3 Output: 1 2 2 3 3 3	Input: row = 5 Output: 1 2 2 3 3 3 4 4 4 4 5 5 5 5 5

Print appropriate message if user has not entered valid choice.

```
#include<stdio.h>
int main()
{
int rows, start,end,i,j, choice;
double harmonicSum = 0.0;
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");
printf("\n1.Print the prime numbers between two numbers n1 and n2: ");
printf("\n2.To display the pattern");
printf("\nEnter choice: ");
scanf("%d", &choice);
switch(choice)
{
case 1:
  printf("Enter the starting number: ");
  scanf("%d", &start);

  printf("Enter the ending number: ");
  scanf("%d", &end);


  if (start >= end) {
```

```
        printf("Invalid range. Please enter a valid range where the
starting number is less than the ending number.\n");
        return 1;
    }

    printf("Prime numbers between %d and %d are:\n", start, end);

   for (int i = start; i <= end; ++i) {
        int isPrime = 1;

        if (i <= 1) {
            isPrime = 0;
        } else {
            for (int j = 2; j * j <= i; ++j) {
                if (i % j == 0) {
                    isPrime = 0;
                    break;
                }
            }
        }

        if (isPrime) {
            printf("%d\n", i);
        }
    }

    return 0;
case 2:
  printf("Enter the number of rows: ");
  scanf("%d", &rows);

  for (int i = 1; i <= rows; ++i) {
      for (int j = 1; j <= i; ++j) {
          printf("%d ", i);
      }
      printf("\n");
  }
```

```
  return 0;

}
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.Print the prime numbers between two numbers n1 and
n2:
2.To display the pattern
Enter choice: 1
Enter the starting number: 5
Enter the ending number: 10
Prime numbers between 5 and 10 are:
5
7
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.Print the prime numbers between two numbers n1 and
n2:
2.To display the pattern
Enter choice: 2
Enter the number of rows: 4
1
2 2
3 3 3
4 4 4 4
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.Print the prime numbers between two numbers n1 and
n2:
2.To display the pattern
Enter choice: 2
Enter the number of rows: 5
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

Q16

b) Write a program to convert a decimal number to hexadecimal without using arrays

```
#include <stdio.h>

int main() {
    int decimalNum;
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");
    printf("\nEnter a decimal number: ");
    scanf("%d", &decimalNum);

    printf("Hexadecimal equivalent: %X\n", decimalNum);

    return 0;
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


Enter a decimal number: 10
Hexadecimal equivalent: A
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


Enter a decimal number: 16
Hexadecimal equivalent: 10
```

Q17

b) Write a menu driven program in C
When 's' - to display the n terms of harmonic series and their sum.
1 + 1/2 + 1/3 + 1/4 + 1/5 ... 1/n terms

Test Case 1: Input: n=6 Output: 1 + 1/2 + 1/3 + 1/4 + 1/5 + ⅙+ sum=2.45	Test Case 2: Input: n=4 Output: 1 + 1/2 + 1/3 + 1/4 + sum=2.08	Test Case 3: Input: n=5 Output: 1 + 1/2 + 1/3 + 1/4 + 1/5 + sum=2.28

When 'p'- to display the following pattern. Number of rows will be input taken from the user.

Test Case 1: Input: row = 4 Output: 1 0 1 1 0 1 0 1 0 1	**Test Case 2:** Input: row = 3 Output: 1 0 1 1 0 1	**Test Case 3:** Input: row = 5 Output: 1 0 1 1 0 1 0 1 0 1 1 0 1 0 1

Print appropriate message if user has not entered valid choice.

```
# include<stdio.h>
int main()
{
int n, choice, rows, cols, num = 1;;
double harmonicSum = 0.0;
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");
printf("\n1.Square: ");
printf("\n2.Rectangle");
printf("\nEnter choice: ");
scanf("%d", &choice);
switch(choice)
{
case 1:

      printf("Enter the size of the pattern: ");
      scanf("%d", &n);

      for (int i = 0; i < n; ++i) {
          for (int j = 0; j < n; ++j) {
              printf("%d ", (i + j) % n);
          }
          printf("\n");
      }

      return 0;

case 2:
      printf("Enter the number of rows: ");
      scanf("%d", &rows);

      printf("Enter the number of columns: ");
      scanf("%d", &cols);

      for (int i = 1; i <= rows; ++i) {
          for (int j = 1; j <= cols; ++j) {
              printf("%d ", num++);
          }
          printf("\n");
```

```
        }

        return 0;
    }
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.Square:
2.Rectangle
Enter choice: 1
Enter the size of the pattern: 5
0 1 2 3 4
1 2 3 4 0
2 3 4 0 1
3 4 0 1 2
4 0 1 2 3
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


1.Square:
2.Rectangle
Enter choice: 2
Enter the number of rows: 3
Enter the number of columns: 6
1 2 3 4 5 6
7 8 9 10 11 12
13 14 15 16 17 18
```

Q18

```
#include <stdio.h>

int main() {
```

```
    int limit;
  printf("Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020 \n\n");
    printf("\nEnter the limit: ");
    scanf("%d", &limit);

    int a = 0, b = 1, c;

    for (int i = 0; i <= limit; ++i) {
        if (a!= i) {
            printf("%d\n", i);
        }

        c = a + b;
        a = b;
        b = c;


        if (c > limit) {
            break;
        }
    }

    return 0;
}
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


Enter the limit: 5
2
3
4
```

```
Name: Aditi Singh, Batch: C1_1, Roll no. 16010123020


Enter the limit: 16
2
3
4
6
```