Batch:	**P5-2**	**Roll No.:**	**16010422185**

Experiment / assignment / tutorial No. 3

Grade: AA / AB / BB / BC / CC / CD /DD

Signature of the Staff In-charge with date

TITLE: Menu driven program.

AIM: Write a menu driven program for following option

a. To find whether a number is palindrome or not. (e.g. 1221 is palindrome) using while loop

b. To calculate the sum of the Fibonacci series up to 'n' terms(use do-while loop only)

c. To find the numbers and sum of all integer between 100 and 200 which are divisible by both 3 & 5(use for loop only)

Expected OUTCOME of Experiment:

Books/ Journals/ Websites referred:

1. Programming in C, second edition, Pradeep Dey and Manas Ghosh, Oxford University Press.
2. Programming in ANSI C, fifth edition, E Balagurusamy, Tata McGraw Hill.
3. Introduction to programming and problem solving , G. Michael Schneider ,Wiley India edition.
4. **http://cse.iitkgp.ac.in/~rkumar/pds-vlab/**

Problem Definition:

The program accepts a choice from the user using a switch case statement and generates output accordingly.

Choice a: The program checks whether a given numbered by user is palindrome or not. If a number remains same, even if we reverse its digits then the number is known as

palindrome number. For example, 12321 is a palindrome number because it remains same if we reverse its digits.

Choice b: Sum of Fibonacci series up to n terms will be generated. Fibonacci series is a series in which each number is the sum of the last two preceding numbers. The first two terms of a Fibonacci series are 0 and 1.(use while loop only)

Example:

Input: n = 5

Output: 7

Explanation: 0 + 1 + 1 + 2 + 3 = 7

Choice c: To find the numbers and sum of all integer between 100 and 200 which are divisible by both 3 & 5.(use for loop only)

Algorithm:

Step 1: START

Step 2: Take the choice input from the user.

Step 3: Execute a specific set of statements according to the user's choice. If the choice is 1, check if a number is Palindrome. If choice is 2, Sum of Fibonacci series up to n terms will be generated. If choice is 3, all integers between 100 and 200 which are divisible by both 3 & 5 are displayed with their sum.

Step 4: Repeat Step 3, till the user selects a valid option in Step 2.

Step 5: STOP

Implementation details:

```
#include<stdio.h>

 int main()
 {

        int num_p, rem, reverse = 0;
        int f0 = 0, f1 = 1, f2, num_f, sum = 1;
        int sum_n = 0;
        int choice;

 do
{
        printf("\n1. Palindrome\n");
        printf("2. Fibonacci\n");
        printf("3. sum of number in range\n");
        printf("4. Exit\n");
        printf("\nEnter choice:" );
        scanf("%d", &choice);

           switch (choice)
                {

                case 1:
                printf("\nEnter a number: ");
                scanf("%d", &num_p);
                int temp = num_p;

                while (num_p != 0)
                        {

                        rem = num_p % 10;
                        reverse = reverse * 10 + rem; num_p /= 10;

                         }

                if (temp == reverse)
                        {

                        printf("\n%d is a palindrome\n", temp);
```

```
        }
else
        {
        printf("\n%d is not a palindrome\n", temp);
         }
 reverse = 0;

break;

case 2:
 printf("\nEnter n: ");
 scanf("%d", &num_f);
 printf("\nFibonacci Series: %d %d", f0, f1);
 int i = 3;
while (i <= num_f)
        {

         f2 = f0 + f1; f0 = f1; f1 = f2;
         printf(" %d", f2);
         sum += f2;
         i++;

        }

printf("\nSum = %d\n", sum);

 break;

case 3:
         for (int i = 100; i <= 200; i++)
        {

         if (i % 3 == 0 && i % 5 == 0)

                 {

                 printf("%d ", i); sum_n += i;

                  }

         }

 printf("\nSum = %d\n", sum_n);
 break;

 case 4:
 printf("Exit");
```

```
                    break;
                    default: printf("Invalid Choice. Enter Again\n");

                    break;
}

}

 while (choice != 4); return 0;

}
```

Output(s):

```
1. Palindrome
2. Fibonacci
3. sum of number in range
4. Exit

Enter choice:1

Enter a number: 4555554

4555554 is a palindrome

1. Palindrome
2. Fibonacci
3. sum of number in range
4. Exit

Enter choice:2

Enter n: 7

Fibonacci Series: 0 1 1 2 3 5 8
Sum = 20

1. Palindrome
2. Fibonacci
3. sum of number in range
4. Exit

Enter choice:3
105 120 135 150 165 180 195
Sum = 1050

1. Palindrome
2. Fibonacci
3. sum of number in range
4. Exit

Enter choice:4
Exit

...Program finished with exit code 0
Press ENTER to exit console.
```

Conclusion:

Menu driven program is created and as per the choice entered by the user, the result is displayed on the screen, i.e If the choice is 1, check if a number is Palindrome. If choice is 2, Sum of Fibonacci series up to n terms will be generated. If choice is 3, all integers between 100 and 200 which are divisible by both 3 & 5 are displayed with their sum. Program exits on choice 4.

Post Lab Descriptive Questions

Write menu driven code for the following:

The program allows a user to enter five numbers and then asks the user to select a choice from a menu. The menu should offer the following options –
1. Display the smallest number entered
2. Display the largest number entered
3. Display the sum of the five numbers entered
4. Display the average of the five numbers entered.
5. Exit

Code:

```
#include <stdio.h>
int main()
{
   int arr[5], min, max, sum = 0; float avg;
   int choice;

   printf("Enter 5 numbers: "); for (int i = 0; i < 5; i++)
   {
   scanf("%d", &arr[i]);
   }

   do
   {
       printf("\n1. Display the smallest number\n"); printf("2. Display the largest number\n"); printf("3. Display the sum of 5 numbers\n");
   printf("4. Display the average of the five numbers\n"); printf("5. Exit\n");
```

```
printf("\nEnter choice: ");


scanf("%d", &choice);

switch (choice)
   {
   case 1:
   min = arr[0];
   for (int i = 0; i < 5; i++)
      {
      if (arr[i] < min)
      {
      min = arr[i];
      }
      }
   printf("Smallest number is %d\n", min); break;

   case 2:
   max = arr[0];
   for (int i = 0; i < 5; i++)
      {
      if (arr[i] > max)
      {
      max = arr[i];
      }
      }
   printf("Largest number is %d\n", max); break;

   case 3:
   for (int i = 0; i < 5; i++)
      {
      sum += arr[i];
      }
   printf("\nSum = %d\n", sum); sum = 0;
   break;

   case 4:
   for (int i = 0; i < 5; i++)
      {
      sum += arr[i];
      }
   avg = sum / 5; printf("\nAverage = %f\n", avg);

   sum = 0;
   break;
```

```
        case 5:
        printf("Exit"); break;

        default:
        printf("Invalid Choice. Enter Again\n"); break;
        }
    } while (choice != 5);

return 0;
}
```

Output:

```
Enter 5 numbers: 45 37 237 27 89

1. Display the smallest number
2. Display the largest number
3. Display the sum of 5 numbers
4. Display the average of the five numbers
5. Exit

Enter choice: 1
Smallest number is 27

1. Display the smallest number
2. Display the largest number
3. Display the sum of 5 numbers
4. Display the average of the five numbers
5. Exit

Enter choice: 2
Largest number is 237

1. Display the smallest number
2. Display the largest number
3. Display the sum of 5 numbers
4. Display the average of the five numbers
5. Exit

Enter choice: 3

Sum = 435

Average = 87.000000

1. Display the smallest number
2. Display the largest number
3. Display the sum of 5 numbers
4. Display the average of the five numbers
5. Exit
```

```
Enter choice: 4

Average = 87.000000

1. Display the smallest number
2. Display the largest number
3. Display the sum of 5 numbers
4. Display the average of the five numbers
5. Exit

Enter choice: 5
Exit

...Program finished with exit code 0
Press ENTER to exit console.
```

Date: _____ **Signature of faculty in-charge**