K. J. Somaiya College of Engineering, Mumbai-77

(A Constituent college of Somaiya Vidyavihar University)

Batch: C2-1 Roll No.: 16010122104

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:

To successfully run a menu-driven program with the above cases.

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)

```
#include<stdio.h>
void main ()
{
   int k;
   printf("Enter (1) TO FIND IF NUMBER IS PALINDROME OR NOT\n");
   int num, temp, rem, rev = 0;
   printf("Enter (2) TO FIND FIBONACCI SERIES\n");
   int i=1,n,f,f1,f2;
   printf("Enter (3) TO FIM SUM\n");
   int j, sum=0;
   scanf("%d", &k);
   switch(k)
   {
```

```
 case 1:


printf("enter a number:");
scanf("%d", &num);
temp = num;
while ( temp > 0)
 {
  rem = temp %10;
  rev = rev *10+ rem;
  temp = temp /10;
 }
if ( num == rev )
  printf("%d is Palindrome Number.", num);
else
  printf("%d is not the Palindrome Number.", num);
    break;


 case 2:
    printf("Enter Number of Fibonacci Values Needed : ");
 scanf("%d",&n);
 f=0;
 f1=1;
 f2=1;
 do
 {
    i++;
```

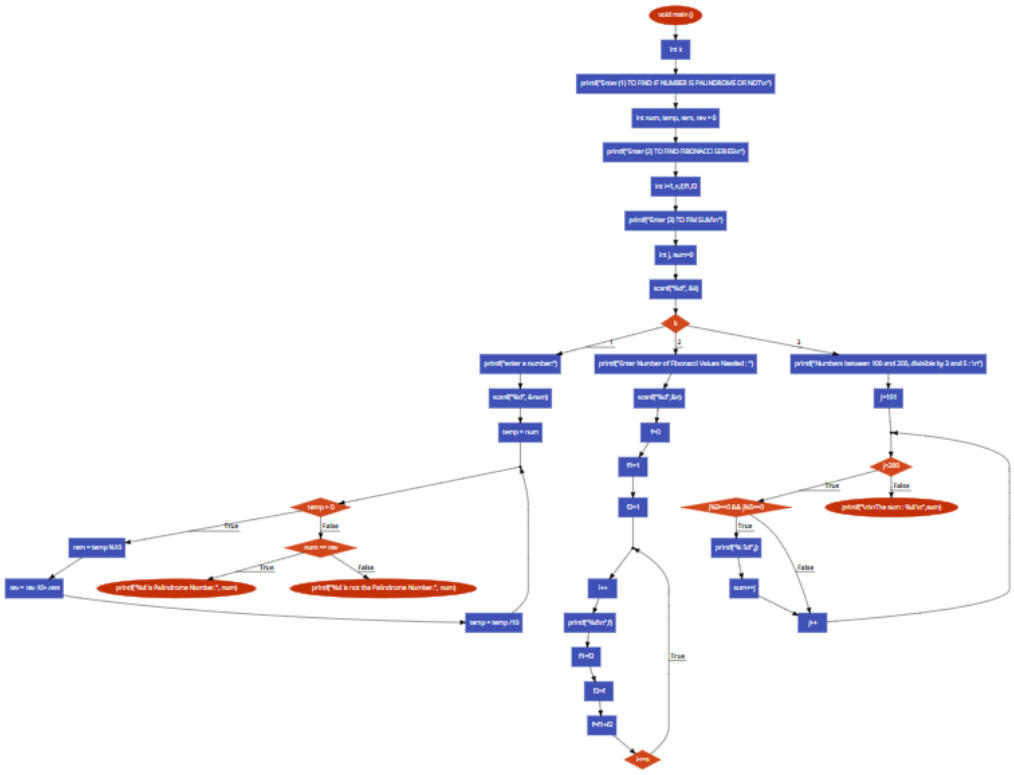
```
      printf("%d\n",f);
      f1=f2;
      f2=f;
      f=f1+f2;
    }
    while(i<=n);
    break;

    case 3:

   printf("Numbers between 100 and 200, divisible by 3 and 5 : \n");
   for(j=101; j<200; j++)
   {
    if(j%3==0 && j%5==0)
    {
      printf("% 5d",j);
      sum+=j;
    }
   }
   printf("\n\nThe sum : %d \n",sum);
   break;

    }
}
```

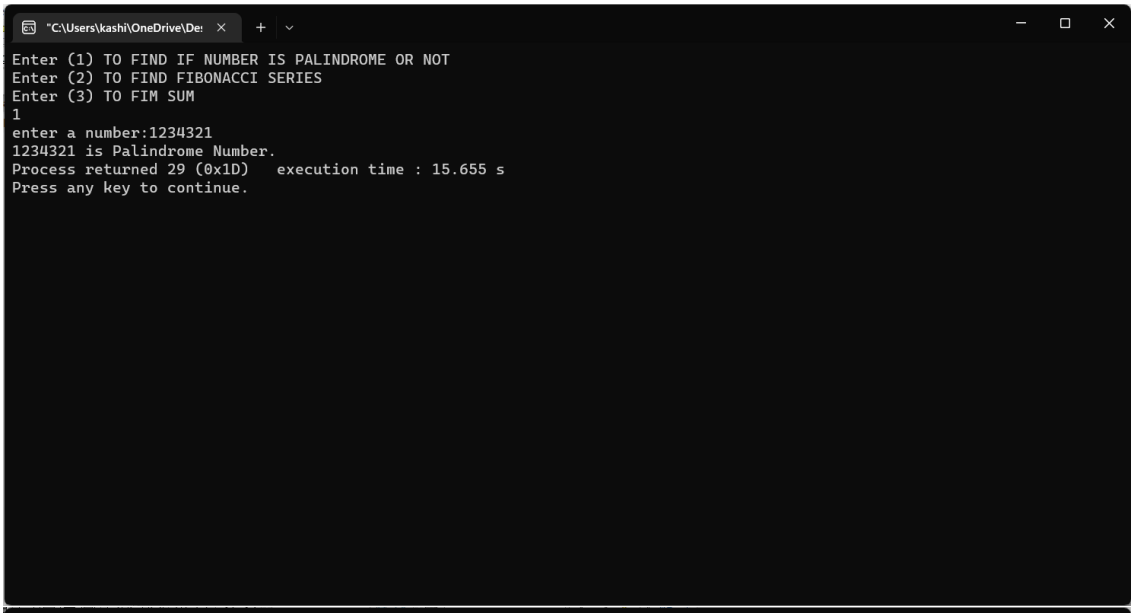
Flowchart:

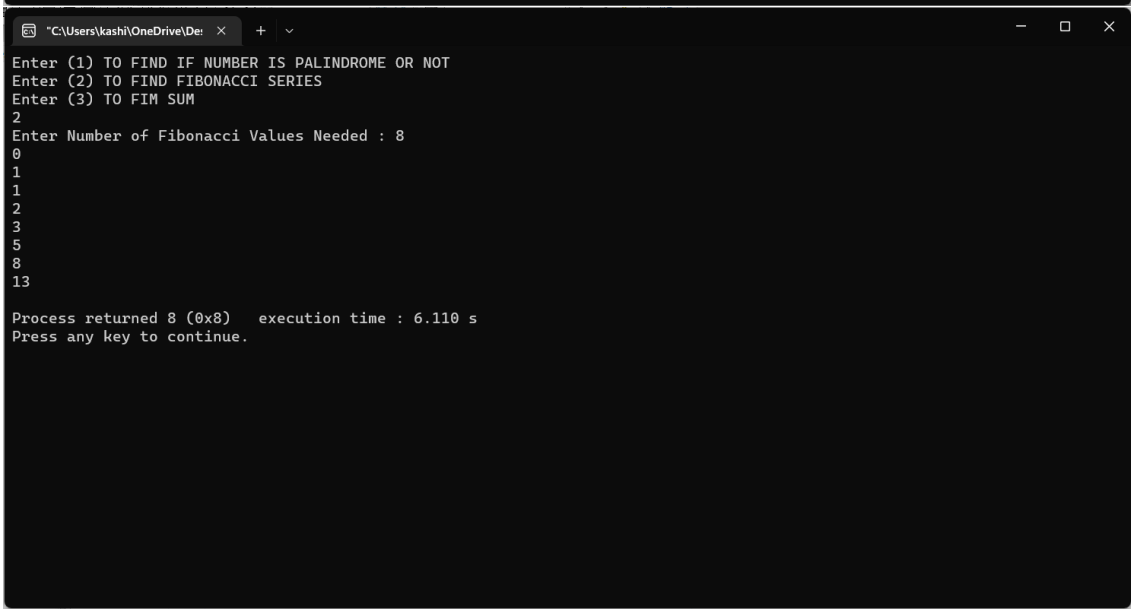

void main ()
int k
int num, temp, rem, rev = 0
int i=1,n,f1,f2
int j, sum=0
scanf("%d", &k)
k
1
2
3
temp = num
temp > 0
True
False
rem = temp %10
rev = rev 10+ rem
num == rev
True
False
temp = temp /10
scanf("%d",&n)
f1=1
f2=1
i++
f1=f2
f2=f
f=f1+f2
j=101
j<200
True
False
sum+=j
j++

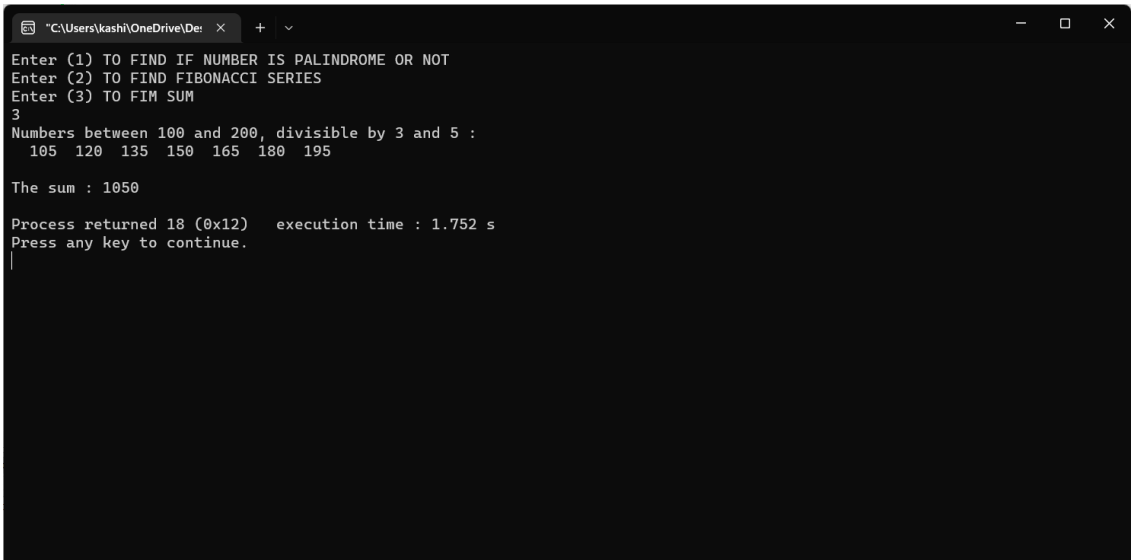
Implementation details:

1) Start
2) Declare k as switch case variable
3) Accept k from user
4) Declare all the necessary variables required for each case
5) If k=1, go to (7)
6) If k=2, go to (17)
7) If k=3, go to (29)
8) Initialize switch case
9) Case 1:
10) temp=num
11) while(temp>0)
12) rem = temp %10;
13) rev = rev *10+ rem;
14) temp = temp /10;
15) If (num==rev)
16) Print palindrome or not
17) break
18) Case 2:
19) f=0;
20) f1=1;
21) f2=1;
22) do-while loop from i to n
23) i++;
24) print f
25) f1=f2;
26) f2=f;
27) f=f1+f2;
28) break
29) Case 3:
30) For loop from 100 to 200
31) Check if divisible by 3 and 5
32) Print i
33) Sum of divisible numbers
34) Print the sum
35) Break
36) Stop

Output(s):


"C:\Users\kashi\OneDrive\De
Enter (1) TO FIND IF NUMBER IS PALINDROME OR NOT
Enter (2) TO FIND FIBONACCI SERIES
Enter (3) TO FIM SUM
1
enter a number:1234321
1234321 is Palindrome Number.
Process returned 29 (0x1D)   execution time : 15.655 s
Press any key to continue.


"C:\Users\kashi\OneDrive\De
Enter (1) TO FIND IF NUMBER IS PALINDROME OR NOT
Enter (2) TO FIND FIBONACCI SERIES
Enter (3) TO FIM SUM
2
Enter Number of Fibonacci Values Needed : 8
0
1
1
2
3
5
8
13
Process returned 8 (0x8)   execution time : 6.110 s
Press any key to continue.


"C:\Users\kashi\OneDrive\De
Enter (1) TO FIND IF NUMBER IS PALINDROME OR NOT
Enter (2) TO FIND FIBONACCI SERIES
Enter (3) TO FIM SUM
3
Numbers between 100 and 200, divisible by 3 and 5 :
105 120 135 150 165 180 195
The sum : 1050
Process returned 18 (0x12)   execution time : 1.752 s
Press any key to continue.

Conclusion:

From this experiment, we learnt how to make use of choice statement – switch case, control statements – for, do while, while loop.

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

Ans.

```
#include <stdio.h>
void main()
{
 int ch, arr[5], r = 0, i, s = sizeof(arr)/sizeof(arr[0]);
 printf("Enter 5 numbers : \n");
 for(int i=0;i<s;i++)
 scanf("%d", &arr[i]);
 printf("\n\n1. Display the smallest number entered\n");
 printf("2. Display the largest number entered\n");
 printf("3. Display the sum of the five numbers entered\n");
 printf("4. Display the average of the five numbers entered\n");
 printf("5. Exit\n\n");
 printf("Enter choice : ");
 scanf("%d", &ch);
 printf("\n");
 switch(ch)
 {
 case 1 :
 for (i=0;i<s-1;i++)
 {
 if(arr[i]>=arr[i+1])
 r = arr[i];
 }
 printf("Smallest number entered is %d", r);
```

```
 break;
 case 2 :
 for (i=0;i<s-1;i++)
 {
 if(arr[i]>=arr[i+1])
 r = arr[i];
 }
printf("Largest number entered is %d", r);
 break;
 case 3 :
 for (i=0;i<s;i++)
 r+=arr[i];
 printf("Sum of 5 numbers entered is %d", r);
 break;
 case 4 :
 for (i=0;i<s;i++)
 r+=arr[i];
 printf("Sum of 5 numbers entered is %d", (int)(r/s));
 break;
 case 5 :
 exit(0);
 default :
 printf("Invalid Choice");
 }
}
```

Date: 07/01/2023 **Signature of faculty in-charge**