Assignment - 7 (Iterative control statements Part - 2)

1. Write a program to find the Nth term of the Fibonnaci series.
Program -

```c
#include <stdio.h>
int main() {
    int a = -1 , b = 1 , c ,i , n;

    printf("Enter the value of n: ");
    scanf("%d",&n);
    for(i = 1 ; i <= n ; i++)
      {
        c = a + b;
        a = b;
        b = c;
      }
  printf("%dth term of the fibonacci series is : %d",n,c);
    return 0;
}
```

Output -
Enter the value of n: 5
5th term of the fibonacci series is : 3

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2. Write a program to print first N terms of Fibonacci series
Program -

```c
#include <stdio.h>

int main() {
    int a = -1 , b = 1 , c ,i , n;

    printf("Enter the value of n: ");
    scanf("%d",&n);
    printf("First %d terms of the fibonacci series\n",n);
    for(i = 1 ; i <= n ; i++)
      {
        c = a + b;
        printf("%d ",c);
        a = b;
        b = c;
      }

    return 0;
}
```

Output -
Enter the value of n: 10
First 10 terms of the fibonacci series
0 1 1 2 3 5 8 13 21 34

3. Write a program to check whether a given number is there in the Fibonacci series or not.

Program -

```c
#include <stdio.h>

int main() {
    int a = -1 , b = 1 , c , i, num , flag = 0;

    printf("Enter a number : ");
    scanf("%d",&num);
    for(i = 1 ; i <= 15 ; i++)
      {
        c = a + b;
        printf("%d ",c);
        if(num == c)
        {
            flag = 1;
        }
        a = b;
        b = c;
      }
  if(flag)
    printf("\n%d is present in the fibonacci series",num);
  else
    printf("\n%d is not present in the fibonacci series",num);

    return 0;
}
```

Output -

0 1 1 2 3 5 8 13 21 34 55 89 144 233 377
8 is present in the fibonacci series

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4. Write a program to calculate HCF of two numbers

Program -

```c
#include <stdio.h>

int main() {
    int a , b , num , divisor , rem;

    printf("Enter two numbers: ");
    scanf("%d%d",&a,&b);

    if(a > b) {
        num = a;
        divisor = b;
    }
    else {
        num = b;
        divisor = a;
```

```c
    }

    rem = num % divisor;

    while(rem)
    {
        num = divisor;
        divisor = rem;
        rem = num % divisor;
    }
    printf("HCF of (%d,%d) is %d",a,b,divisor);
    return 0;
}
```

Output -
Enter two numbers: 8 68
HCF of (8,68) is 4

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5. Write a program to check whether two given numbers are co-prime numbers or not
Program -
```c
#include <stdio.h>

int main() {
    int a , b , num , divisor , rem;

    printf("Enter two numbers: ");
    scanf("%d%d",&a,&b);

    if(a > b) {
        num = a;
        divisor = b;
    }
    else {
        num = b;
        divisor = a;
    }

    rem = num % divisor;

    while(rem)
    {
        num = divisor;
        divisor = rem;
        rem = num % divisor;
    }
    if(divisor == 1)
        printf("%d and %d are Co-prime numbers",a,b);
    else
        printf("%d and %d are not Co-prime numbers",a,b);
    return 0;
```

```
}
```

Output -
Enter two numbers: 3 5
3 and 5 are Co-prime numbers

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6. Write a program to print all Prime numbers under 100
Program -
```c
#include <stdio.h>

int main() {
    int i , x;
    printf("Prime numbers under 100 are :-\n");
    for(i = 2 ; i < 98 ; i++)
    {
        for(x = 2 ; x <= i ; x++)
        {
            if(i % x == 0)
            break;
        }
        if(i == x)
        printf("%d ",i);
    }
    return 0;
}
```

Output -
Prime numbers under 100 are :-
2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97

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7. Write a program to print all Prime numbers between two given numbers
Program -
```c
#include <stdio.h>

int main() {
    int i , x , a , b , lower , upper;
    printf("Enter two numbers: ");
    scanf("%d%d",&a,&b);

    if(a < b)
    {
        lower = a;
        upper = b;
    }
    else
    {
        lower = b;
        upper = a;
    }
```

```
        printf("All prime numbers between %d and %d are\n",lower,upper);
        for(i = lower+1 ; i < upper ; i++)
        {
            for(x = 2 ; x <= i ; x++)
            {
                if(i % x == 0)
                break;
            }
            if(i == x)
            printf("%d ",i);
        }
        return 0;
}
```

Output -
Enter two numbers: 1 50
All prime numbers between 1 and 50 are
2 3 5 7 11 13 17 19 23 29 31 37 41 43 47

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8. Write a program to find next Prime number of a given number
Program -
```
#include <stdio.h>

int main() {
    int n , num , i;

    printf("Enter a number: ");
    scanf("%d",&n);

    num = n;

    while(1)
    {
        n++;
        for(i = 2 ; i <= n ; i++)
        {
            if(n % i == 0)
                break;
        }
        if(i == n)
        {
            printf("%d is next prime number after %d",n,num);
            break;
        }
    }
    return 0;
}
```

Output -
Enter a number: 15
17 is next prime number after 15

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9. Write a program to check whether a given number is an Armstrong number or not
Program -
```c
#include <stdio.h>

int main() {
    int n , num , digit , sum = 0;

    printf("Enter a number: ");
    scanf("%d",&n);

    num = n;

    while(n)
    {
        digit = n % 10;
        n = n / 10;
        sum = sum + (digit * digit * digit);
    }

    if(sum == num)
        printf("%d is an Armstrong number",num);
    else
        printf("%d is not an Armstrong number",num);
    return 0;
}
```

Output -
Enter a number: 371
371 is an Armstrong number

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10. Write a program to print all Armstrong numbers under 1000
Program-
```c
#include <stdio.h>

int main() {
    int i , num , digit , sum;

    for(i = 0 ; i <= 999 ; i++)
    {
        num = i;
        sum = 0;
        while(num) {
            digit = num % 10;
            num = num / 10;
            sum = sum + (digit * digit * digit);
```

```c
        }

        if(sum == i)
            printf("%d  ",i);
    }
    return 0;
}
```

Output -
0 1 153 370 371 407