

People's Democratic Republic of Algeria

Echahid Hamma Lakhdar University



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DS & ALGO : Series 02

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## Exercise 1

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     int i= 1;
5     while(i <= 10) printf("%d \n",i++);
6     return 0;
7 }
```

## Exercise 2

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     int i;
5     for(i = 1 ; i <= 100; i++) printf("%d \n",i);
6     return 0;
7 }
```

## Exercise 3

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     int i = 2;
5     do {
6         printf("%d \n",i);
7         i += 2;
8     }while(i <= 20);
9     return 0;
10 }
```

## Exercise 4

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     int n,i;
5     do {
6         printf("Enter a strictly positive integer n :");
7         scanf("%d",&n);
8     }while(n < 0);
9     if (n % 2 == 1) i = n; else i = n+1;
10    printf("First %d \n",n+99);
11    for(i ; i <= n+99 ; i += 2) printf("%d \n",i);
12    return 0;
13
14 }
```

## Exercise 5

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     int n,i = 2;
5     do{
6         printf("Enter a strictly positive integer n : ");
7         scanf("%d",&n);
8     }while(n < 0);
9
10    while(i <= n) {
11        printf("%d \n",i);
12        i += 2;
13    }
14    return 0;
15 }
```

## Exercise 6

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     int n,i;
5     do{
6         printf("Enter a strictly positive integer n : ");
7         scanf("%d",&n);
8         if(n < 0) printf("Error! n must be strictly postiiive");
9
10    }while(n < 0);
11    for( i = 1 ; i <= 9 ; i++) {
12        printf("%d x %d = %d \n", n , i , n*i);
13    }
14    return 0;
15 }
```

## Exercise 7

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     int f_0 = 0;
5     int f_1 = 1;
6     int n,f_n ,temp,i =2;
7     do {
8         printf("Enter the which fibonnaci term to calculate : ");
9         scanf("%d",&n);
10
11    }while(n < 2);
12
13    printf("F(0) = 0 \nF(1) = 1 \n");
14    while(i< n) {
15        f_n = f_0 + f_1;
16        f_0 = f_1;
17        f_1 = f_n;
18        printf("F(%d) = %d \n",i,f_n);
19        i++;
20    }
21    return 0;
22 }
```

## Exercise 8

Code:

```
1 #include<stdio.h>
2 int main() {
3     int n , i;
4     float sum = 0.0;
5     do {
6         printf("Enter tehe number of terms to calculate in the sum :
7             ");
8         scanf ("%d",&n);
9     }while (n < 1);
10    for( i = 0 ; i <= n ; i++) {
11        sum += 1/i;
12    }
13    printf("The harmonic sum up to %d = %f",n,sum);
14    return 0;
15 }
```

## Exercise 9

Code:

```
1 #include<stdio.h>
2 int main() {
3     int n , i;
4     do {
5         printf("Enter a natural number n : ");
6         scanf ("%d",&n);
7     }while (n < 1);
8     printf("The divisiors of %d are : 1 ",n);
9     for(i = 2 ; i < n/2 ; i++ ) {
10        if(n % i == 0) printf("%d ",i);
11    }
12    printf("%d",n);
13 }
```

## Exercise 10

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     //Same as problem 8 ?
5 }
```

## Exercise 11

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     int n,i,sum = 0;
5     do {
6         printf("Enter the term to calculate the sum of the first n
7             odd squares : ");
8         scanf("%d",&n);
9     }while(n < 1);
10    for(i = 1 ; i <= n ; i++) {
11        sum += (2*i - 1) * (2*i -1);
12    }
13    printf("The sum of the first %d odd squares = %d",n,sum);
14    return 0;
15 }
```

## Exercise 12

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     //Same as problem 12 ?
5 }
```

## Exercise 13

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     int n,i, sum = 0;
5     do {
6         printf("Enter a natural number n : ");
7         scanf("%d",&n);
8     }while (n < 0);
9     i = n;
10    while(0 < i) {
11        sum += i % 10;
12        i /= 10;
13    }
14    printf("The sum of digits of %d = %d",n,sum);
15    return 0;
16 }
```

## Exercise 14

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     int cnt = 1,n,i = 3,j,isPrime = 1,sum;
5     do {
6         printf("Enter the number n to calculate the sum of primes up
7             to n : ");
8         scanf("%d",&n);
9     } while(n < 1);
10    if(n == 1) {
11        sum = 2;
12    } else {
13        sum = 2;
14        while(cnt <= n) {
15            for(j = 2 ; j < n/2 ; j++) {
16                if(i % j == 0) {
17                    isPrime = 0;
18                }
19            }
20            if(isPrime) {
21                sum += i;
22                cnt++;
23            }
24        }
25    }
```

```
22         }
23
24         isPrime = 1;
25         i++;
26     }
27 }
28 print("The sum of the first %d prime numbers : %d",n,sum);
29 return 0;
30
31 }
```

## Exercise 15

Code:

```
1 #include<stdio.h>
2
3 int main() {
4     int n,i,sum = 0;
5     do {
6         printf("Enter the term to calculate the sum of the first n
7             odd cubes : ");
8         scanf("%d",&n);
9     }while(n < 1);
10    for(i = 1 ; i <= n ; i++) {
11        sum += (2*i - 1) * (2*i -1) * (2*i-1);
12    }
13    printf("The sum of the first %d odd cubes = %d",n,sum);
14    return 0;
15 }
```