23CSE211 DESIGN AND ANALYSIS OF ALGORITHMS

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CSE-C

1)Write a program to find the sum of first n natural number using user defined function

```c
#include<stdio.h>
int sumN(int n){
return n*(n+1)/2;
}
int main(){
int n;
scanf("%d",&n);
printf("sum: %d\n",sumN(n));
}
```

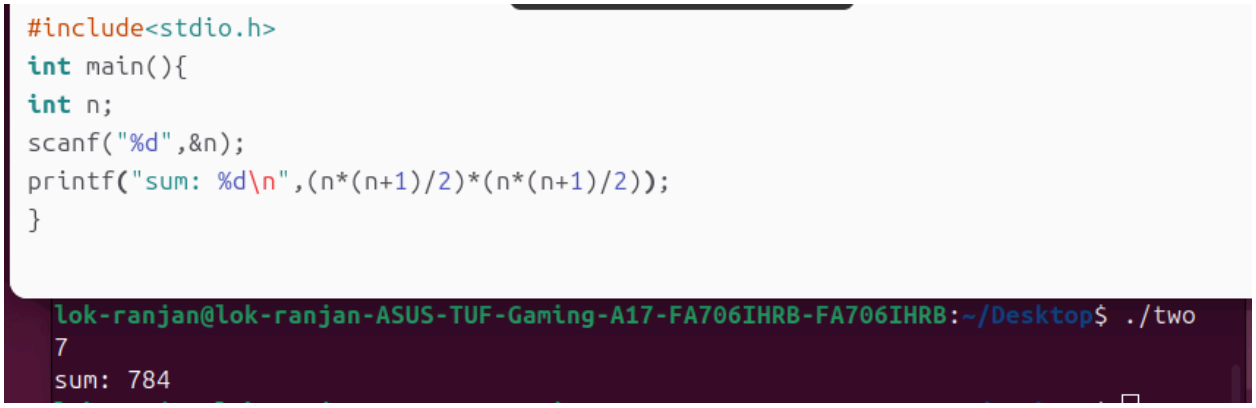
```
lok-ranjan@lok-ranjan-ASUS-TUF-Gaming-A17-FA706IHRB-FA706IHRB:~/Desktop$ ./two
5
sum: 15
```

2)Write a program to find the sum of square first n natural number using user defined function

```c
#include<stdio.h>
int sumofsquares(int n){
return n*(n+1)*(2*n+1)/6;
}
int main(){
int n;
scanf("%d",&n);
printf("sum: %d\n",sumofsquares(n));
}
```

```
lok-ranjan@lok-ranjan-ASUS-TUF-Gaming-A17-FA706IHRB-FA706IHRB:~/Desktop$ ./two
9
sum: 285
```

3)Write a program to find the sum of cube of first n natural number using user defined function



```c
#include<stdio.h>
int main(){
int n;
scanf("%d",&n);
printf("sum: %d\n",(n*(n+1)/2)*(n*(n+1)/2));
}
```

```
lok-ranjan@lok-ranjan-ASUS-TUF-Gaming-A17-FA706IHRB-FA706IHRB:~/Desktop$ ./two
7
sum: 784
```

4)Write a program to find the factorial of natural number using recursive function

```c
#include<stdio.h>
int factorial(int num){
if(num==2){
return 2;}
return num*(factorial(num-1));
}
int main(){
int n;
scanf("%d",&n);
printf(" %d\n",factorial(n));
}
```

```
lok-ranjan@lok-ranjan-ASUS-TUF-Gaming-A17-FA706IHRB-FA706IHRB:~/Desktop$ ./tw
5
 120
```

5)Write a program to transpose 3*3 matrix

```c
#include <stdio.h>
int main() {
    int matrix[3][3], transpose[3][3];
    printf("Enter elements of 3x3 matrix:\n");
    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            scanf("%d", &matrix[i][j]);
        }}
    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            transpose[j][i] = matrix[i][j];
        }}
    printf("\nOriginal Matrix:\n");
    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            printf("%d ", matrix[i][j]);}
        printf("\n");}
    printf("\nTranspose of the Matrix:\n");
    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            printf("%d ", transpose[i][j]);}
        printf("\n");}
        return 0;}
```

```
lok-ranjan@lok-ranjan-ASUS-TUF-Gamin
Enter elements of 3x3 matrix:
1
2
43
55
33
22
12
33
44

Original Matrix:
1 2 43
55 33 22
12 33 44

Transpose of the Matrix:
1 55 12
2 33 33
43 22 44
lok-ranjan@lok-ranjan-ASUS-TUF-Gam
```

6)Print Fibonacci series upto given number in user defined function

```c
#include <stdio.h>
void fibonacci(int limit) {
    int a = 0, b = 1, c;
    printf("Fibonacci Series up to %d:\n", limit);
    if (a <= limit) printf("%d ", a);
    if (b <= limit) printf("%d ", b);
    while (1) {
        c = a + b;
        if (c > limit)
            break;
        printf("%d ", c);
        a = b;
        b = c;   }
}
int main() {
    int num;
    printf("Enter a number: ");
    scanf("%d", &num);
    fibonacci(num);
    return 0;}
```

```
lok-ranjan@lok-ranjan-ASUS-TUF-Gaming-A17-FA706IHRB-FA706IHRB: ~/...
43 22 44
lok-ranjan@lok-ranjan-ASUS-TUF-Gaming-A17-FA706IHRB-FA706IHRB:~/Desktop$
.c -o two
lok-ranjan@lok-ranjan-ASUS-TUF-Gaming-A17-FA706IHRB-FA706IHRB:~/Desktop$
Enter a number: 5
Fibonacci Series up to 5:
0 1 1 2 3 5 lok-ranjan@lok-ranjan-ASUS-TUF-Gaming-A17-FA706IHRB-FA706IHRB
```