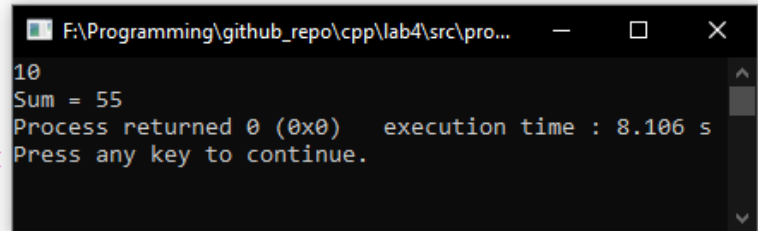2. Write a c program to print the sum of the following series:

a. $1 + 2 + 3 + \ldots\ldots\ldots + N$
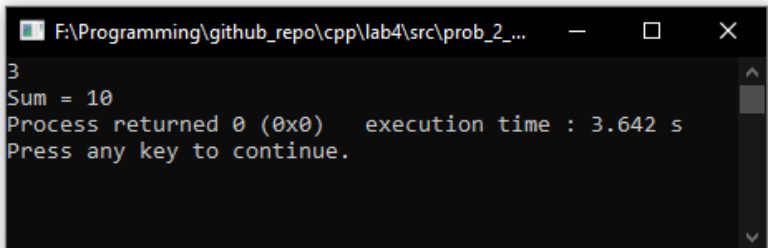
```
1     #include<stdio.h>
2
3     int main()
4     {
5         int i, n, sum=0;
6
7         scanf("%d", &n);
8
9         for(i=1; i<=n; i++){
10            sum = sum + i;
11        }
12
13        printf("Sum = %d", sum);
14
15        return 0;
16    }
17
```

Console output:
```
F:\Programming\github_repo\cpp\lab4\src\pro...   —   □   ×
10
Sum = 55
Process returned 0 (0x0)   execution time : 8.106 s
Press any key to continue.
```

b. $1^2 + 3^2 + 5^2 + \ldots\ldots + N^2$
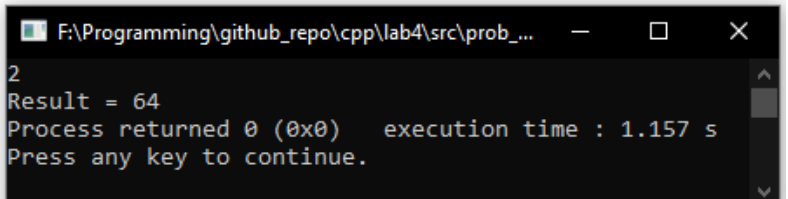
```
1     #include <stdio.h>
2
3     int main()
4     {
5         int i, n, sum = 0;
6
7         scanf("%d", &n);
8
9         for(i=1; i<=n; i+=2){
10            sum = sum + i*i;
11        }
12
13        printf("Sum = %d", sum);
14
15        return 0;
16    }
```

Console output:
```
F:\Programming\github_repo\cpp\lab4\src\prob_2_...   —   □   ×
3
Sum = 10
Process returned 0 (0x0)   execution time : 3.642 s
Press any key to continue.
```

c. $2^2 + 4^2 + 6^2 + \ldots\ldots + N^2$
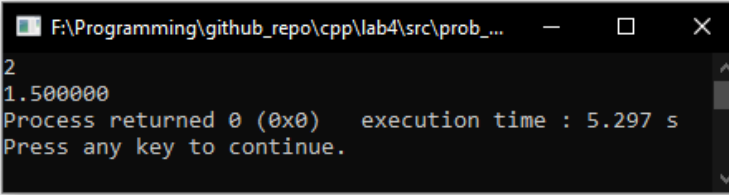
```
1     // 2^2 * 4^2 * 6^2 ....
2     #include<stdio.h>
3
4     int main()
5     {
6         int i, j=2, n, result=1;
7
8         scanf("%d", &n);
9
10        for(i=1; i<=n; i++){
11            result *= j*j;
12            j+=2;
13        }
14
15        printf("Result = %d", result);
16
17        return 0;
18    }
```

Console output:
```
F:\Programming\github_repo\cpp\lab4\src\prob_...   —   □   ×
2
Result = 64
Process returned 0 (0x0)   execution time : 1.157 s
Press any key to continue.
```

d. 1 + ½ + ⅓ + ………….. + 1/N
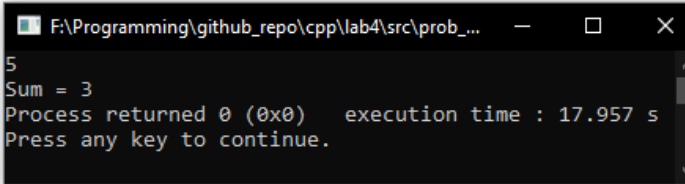
```c
1    #include<stdio.h>
2
3    int main()
4    {
5        int i, n;
6        float sum = 0;
7
8        scanf("%d", &n);
9
10       for(i=1; i<=n; i++){
11           sum = sum + 1.0/i;
12       }
13
14
15       printf("%f", sum);
16
17       return 0;
18   }
```

Terminal output:
```
F:\Programming\github_repo\cpp\lab4\src\prob_...
2
1.500000
Process returned 0 (0x0)   execution time : 5.297 s
Press any key to continue.
```

e. 1 - 2 + 3 - 4 + 5 - 6 + .. + N

```c
1    // 1 - 2 + 3 - 4 + 5 - ....
2    #include<stdio.h>
3
4    int main()
5    {
6        int i, n, sum = 0;
7
8        scanf("%d", &n);
9
10       for(i=1; i<=n; i++){
11           if(i%2 == 0)
12               sum -= i;
13           else
14               sum += i;
15       }
16
17       printf("Sum = %d", sum);
18
19       return 0;
20   }
```
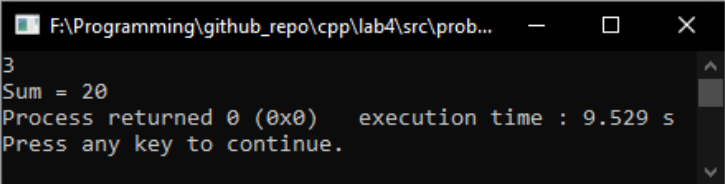
Terminal output:
```
F:\Programming\github_repo\cpp\lab4\src\prob_...
5
Sum = 3
Process returned 0 (0x0)   execution time : 17.957 s
Press any key to continue.
```

f. 1 * 2 + 2 * 3 + 3 * 4+ ……. + n1 * n2

```c
1    #include<stdio.h>
2
3    int main()
4    {
5        int i, n, sum=0;
6
7        scanf("%d", &n);
8
9        for(i=1; i<=n; i++){
10           sum += i * (i+1);
11       }
12
13       printf("Sum = %d", sum);
14
15       return 0;
16   }
```
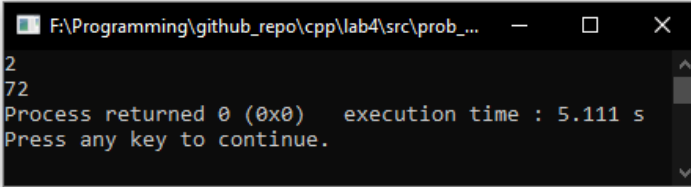
Terminal output:
```
F:\Programming\github_repo\cpp\lab4\src\prob...
3
Sum = 20
Process returned 0 (0x0)   execution time : 9.529 s
Press any key to continue.
```

g. 1 * 3 * 4 + 2 * 5 * 6 + 3 * 7 * 8 + ……… + n1 * n2 * n3

```c
#include<stdio.h>

int main()
{
    int i, n, j=3, sum=0;

    scanf("%d", &n);

    for(i=1; i<=n; i++){
        sum += i * j * (j+1);
        j+=2;
    }

    printf("%d", sum);

    return 0;
}
```

```
F:\Programming\github_repo\cpp\lab4\src\prob_...   —   □   ✕
2
72
Process returned 0 (0x0)   execution time : 5.111 s
Press any key to continue.
```
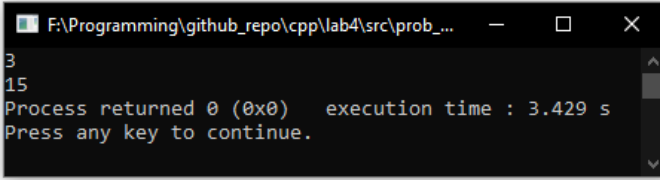
h. 1 + 5 + 9 + ………. + Nth number

```c
#include<stdio.h>

int main()
{
    int i, n, num=1, sum = 0;

    scanf("%d", &n);

    for(i=0; i<n; i++, num+=4){
        sum += num;
    }

    printf("%d", sum);

    return 0;
}
```
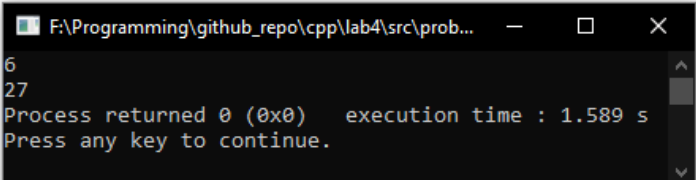
```
F:\Programming\github_repo\cpp\lab4\src\prob_...   —   □   ✕
3
15
Process returned 0 (0x0)   execution time : 3.429 s
Press any key to continue.
```

i. 1 + 2 + 4 + 5 + 7 + 8 + ……… + N

```c
// 1+2+4+5+7+8....

#include<stdio.h>

int main()
{
    int i, num=1, n, sum = 0;

    scanf("%d", &n);

    for(i=1; i<=n; i++){
        if(num%3 == 0){
            num++;
        }
        sum += num;
        num++;
    }

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

```
F:\Programming\github_repo\cpp\lab4\src\prob...   —   □   ✕
6
27
Process returned 0 (0x0)   execution time : 1.589 s
Press any key to continue.
```

j. 60 + 57 + 5 + ………. >= 1

```c
1    #include<stdio.h>
2
3    int main()
4    {
5        int i, sum = 0;
6        int num = 60;
7
8        for(i=num; i>0; i-=3){
9            sum += i;
10       }
11
12       printf("%d", sum);
13
14       return 0;
15   }
16
```

Console output:
```
F:\Programming\github_repo\cpp\lab4\src\prob_...      —      □      ✕
630
Process returned 0 (0x0)    execution time : 0.070 s
Press any key to continue.
```

3. Write a c program to calculate the sum of the Fibonacci series upto N-th tern.

0 + 1 + 1 + 2 + 3 + 5 + 8 + ………. + Nth term

```c
1    #include<stdio.h>
2
3    int main()
4    {
5        int i, n, f=0, s=1, temp, sum=f;
6
7        scanf("%d", &n);
8
9        for(i=1; i<n; i++){
10           sum += s;
11           temp = f + s;
12           f = s;
13           s = temp;
14       }
15
16       printf("%d", sum);
17
18       return 0;
19   }
```

Console output:
```
F:\Programming\github_repo\cpp\lab4\src\prob...      —      □      ✕
5
7
Process returned 0 (0x0)    execution time : 2.559 s
Press any key to continue.
```

4. Write a c program to calculate the factorial of a number.

```c
1    #include<stdio.h>
2
3    int main()
4    {
5        int i, n, result = 1;
6
7        scanf("%d", &n);
8
9        if(n < 0){
10           printf("Invalid Input");
11       }else{
12           for(i=n; i>=1; i--){
13               result *= i;
14           }
15
16           printf("%d! = %d", n, result);
17       }
18
19       return 0;
20   }
```

Console output:
```
F:\Programming\github_repo\cpp\lab4\src\prob...      —      □      ✕
3
3! = 6
Process returned 0 (0x0)    execution time : 5.374 s
Press any key to continue.
```