**Exercises and Solution**

Q1 : Write a program in C++ to display n terms of natural numbers and their sum.  
Sample Output:  
Input a number of terms: 7  
The natural numbers upto 7th terms are:  
1 2 3 4 5 6 7  
The sum of the natural numbers is: 28

Solution:

#include <iostream>

using namespace std;

int main()

{

int n,i,sum=0;

cout << "\n\n Display n terms of natural number and their sum:\n";

cout << "---------------------------------------\n";

cout << " Input a number of terms: ";

cin>> n;

cout << " The natural numbers upto "<<n<<"th terms are: \n";

for (i = 1; i <= n; i++)

{

cout << i << " ";

sum=sum+i;

}

cout << "\n The sum of the natural numbers is: "<<sum << endl;

}

Q2: Write a program in C++ to find the factorial of a number.  
Sample output:  
Input a number to find the factorial: 5  
The factorial of the given number is: 120

Solution:

#include <iostream>

using namespace std;

int main()

{

int num1,factorial=1;

cout << "\n\n Find the factorial of a number:\n";

cout << "------------------------------------\n";

cout << " Input a number to find the factorial: ";

cin>> num1;

for(int a=1;a<=num1;a++)

{

factorial=factorial\*a;

}

cout<<" The factorial of the given number is: "<<factorial<<endl;

return 0;

}

Q3: Write a program in C++ to calculate the sum of the series (1\*1) + (2\*2) + (3\*3) + (4\*4) + (5\*5) + ... + (n\*n).

#include <iostream>

using namespace std;

int main()

{

int i, n, sum = 0;

cout << "\n\n Find the sum of the series (1\*1) + (2\*2) + (3\*3) + (4\*4) + (5\*5) + ... + (n\*n):\n";

cout << "------------------------------------------------------------------------------------\n";

cout << " Input the value for nth term: ";

cin >> n;

for (i = 1; i <= n; i++)

{

sum += i \* i;

cout << i << "\*" << i << " = " << i \* i << endl;

}

cout << " The sum of the above series is: " << sum << endl;

}

Q4: Write a program in C++ to print a square pattern with the # character.  
Sample Output:  
Print a pattern like square with # character:  
--------------------------------------------------  
Input the number of characters for a side: 4  
 # # ##  
# # # #  
# # # #  
# # # #

**Solution:**

#include <iostream>

using namespace std;

int main()

{

int size;

cout << "\n\n Print a pattern like square with # character:\n";

cout << "--------------------------------------------------\n";

cout << " Input the number of characters for a side: ";

cin >> size;

for (int col = 1; col <= size; ++col) // Column

{

for (int row = 1; row <= size; ++row) // Row

{

cout << "# ";

}

cout << endl;

}

return 0;

}

Q5: Write a C++ program that displays the sum of n odd natural numbers.  
Sample Output:  
Input number of terms: 5  
The odd numbers are: 1 3 5 7 9  
The Sum of odd Natural Numbers upto 5 terms: 25

Solution:

#include <iostream>

using namespace std;

int main()

{

int i, n, sum = 0;

cout << "\n\n Display n terms of odd natural number and their sum:\n";

cout << "---------------------------------------------------------\n";

cout << " Input number of terms: ";

cin >> n;

cout << " The odd numbers are: ";

for (i = 1; i <= n; i++)

{

cout << 2 \* i - 1 << " ";

sum += 2 \* i - 1;

}

cout << "\n The Sum of odd Natural Numbers upto " << n << " terms";

" << sum << endl";

}