

Problem on CPP loops-2

Assignment Solutions



Q1- Write a program to calculate factorial of a number.

```
Q1.cpp > ...
1  #include <iostream>
2  using namespace std;
3
4  int main()
5  {
6      int j,number;
7      cout << "Enter number" << "\n";
8      cin >> number;
9      int fact = 1;
10     for (j=1;j<=number;j++){
11         fact = fact*j;
12     }
13     cout << "Factorial is:" <<fact << "\n";
14     return 0;
15 }
```

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```
PS C:\Users\Admin\Desktop\Programs\Lessonplan6loops> cd "c:\Users\Admin\Desktop\Programs
Q1.cpp -o Q1 } ; if ($?) { .\Q1 }
Enter number
5
Factorial is:120
PS C:\Users\Admin\Desktop\Programs\Lessonplan6loops> 
```

```
#include <iostream>
using namespace std;

int main()
{
    int j,number;
    cout << "Enter number" << "\n";
    cin >> number;
    int fact = 1;
    for (j=1;j<=number;j++){
        fact = fact*j;
    }
    cout << "Factorial is:" <<fact << "\n";
    return 0;
}
```

Q2- Write a program to print all Armstrong numbers between 100 to 500.

```
Q2.cpp > main()
1  #include<iostream>
2  using namespace std;
3  int main()
4  {
5      cout<<"Armstrong numbers in the range of 100 to 500 are : "<<endl;
6      for(int i=0;i<500;i++)
7      {
8          int sum = 0;
9          int t = i;
10         while(t!=0)
11         {
12             sum = sum+((t%10)*(t%10)*(t%10));
13             t = t/10;
14         }
15         if(sum == i)
16         {
17             cout << i << "\n";
18         }
19     }

```

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```
Q2.cpp -o Q2 ; if ($?) { .\Q2 }
Armstrong numbers in the range of 100 to 500 are :
0
1
153
370
371
407
PS C:\Users\Admin\Desktop\Programs\Lessonplan6loops>

```

```
#include<iostream>
using namespace std;
int main()
{
    cout<<"Armstrong numbers in the range of 100 to 500 are : "<<endl;
    for(int i=0;i<500;i++)
    {
        int sum = 0;
        int t = i;
        while(t!=0)
        {
            sum = sum+((t%10)*(t%10)*(t%10));
            t = t/10;
        }
        if(sum == i)
        {
            cout << i << "\n";
        }
    }
    return 0;
}

```

Q3- Write a program to find the sum of n natural number.

```
Q3.cpp > main()
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      int num, sum;
6      sum = 0;
7
8      cout << "Enter a positive integer: ";
9      cin >> num;
10
11     for (int i = 1; i <= num; ++i) {
12         sum += i;
13     }
14     cout << "Sum = " << sum << endl;
15
16     return 0;
17 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\Admin\Desktop\Programs\Lessonplan6loops> cd "c:\Users\Admin\Desktop\Programs\Lessonplan6loops"
Q3.cpp -o Q3 } ; if ($?) { .\Q3 }
Enter a positive integer: 5
Sum = 15
PS C:\Users\Admin\Desktop\Programs\Lessonplan6loops> 
fwd-i-search: _
```

```
include <iostream>
using namespace std;

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

    cout << "Enter a positive integer: ";
    cin >> num;

    for (int i = 1; i <= num; ++i) {
        sum += i;
    }
    cout << "Sum = " << sum << endl;

    return 0;
}
```

Q4 - Write a program to reverse a given integer number.

```
Q4.cpp > main()
1  #include<iostream>
2  using namespace std;
3  int main()
4  {
5      int n,t,r,rev=0;
6      cout<<"Enter any number : ";
7      cin>>n;
8      t=n;
9
10     while(t>0)
11     {
12         r=t%10;
13         t=t/10;
14         rev=rev*10+r;
15     }
16     cout<<"Reverse of number "<<n<<" is "<<rev;
17     return 0;
18 }
19
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\Admin\Desktop\Programs\Lessonplan6loops> cd "c:\Users\Admin\Desktop\Programs\Lessonplan6loops"
Q4.cpp -o Q4 } ; if ($?) { .\Q4 }
Enter any number : 586
Reverse of number 586 is 685
PS C:\Users\Admin\Desktop\Programs\Lessonplan6loops>
fwd-i-search: _
```

```
#include<iostream>
using namespace std;
int main()
{
    int n,t,r,rev=0;
    cout<<"Enter any number : ";
    cin>>n;
    t=n;

    while(t>0)
    {
        r=t%10;
        t=t/10;
        rev=rev*10+r;
    }
    cout<<"Reverse of number "<<n<<" is "<<rev;
    return 0;
}
```

Q5 - Write a program to print the cross pattern given below (in the shape of X):

```
* *
* *
*
* *
* *
```

```
Lessonplan8loops > G+ Q5.cpp > main()
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5
6      int size = 5; // size of cross, use odd number
7
8      for (int i = 0; i < size; i++) {
9          for (int j = 0; j < size; j++) {
10             if (i==j || i+j==size-1) {
11                 cout << "*";
12             } else {
13                 cout << " ";
14             }
15         }
16     }
17 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
; if ($?) { g++ Q5.cpp -o Q5 } ; if ($?) { .\Q5 }
* *
* *
*
* *
* *
* *
PS C:\Users\Admin\Desktop\Programs\Lessonplan8loops>
```

```
#include <iostream>
using namespace std;

int main() {

    int size = 5; // size of cross,use odd number

    for (int i = 0; i < size; i++) {
        for (int j = 0; j < size; j++) {
            if (i==j || i+j==size-1) {
                cout << "*";
            } else {
                cout << " ";
            }
        }
        cout << "\n";
    }
    return 0;
}
```

Q6- Write a program to print alphabet diamond pattern:

```
A
ABC
ABCDE
ABCDEF
ABCDEFGH
ABCDEFGH
ABCDEFG
ABCDE
ABC
A
```

Lessonplan8loops >  Q6.cpp >  main()

```
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      int size = 5;
6      int alpha = 65;
7      int num = 0;
8      // upside pyramid
9      for (int i = 1; i <= size; i++) {
10         // printing spaces
11         for (int j = size; j > i; j--) {
12             cout << " ";
```

PROBLEMS

OUTPUT

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```
A
ABC
ABCDE
ABCDEF
ABCDEFGH
ABCDEFGH
ABCDEFG
ABCDE
ABC
A
```

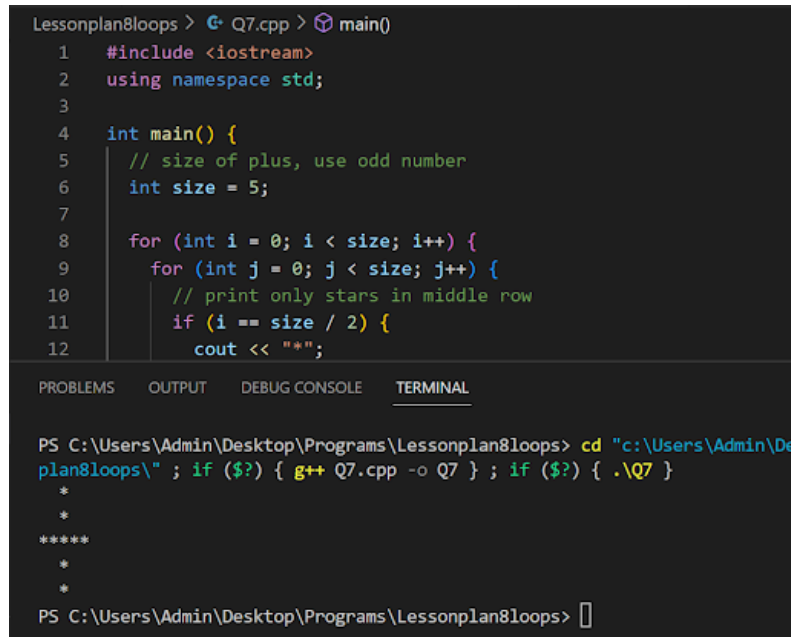
PS C:\Users\Admin\Desktop\Programs\Lessonplan8loops>

```
#include <iostream>
using namespace std;

int main() {
    int size = 5;
    int alpha = 65;
    int num = 0;
    // upside pyramid
    for (int i = 1; i <= size; i++) {
        // printing spaces
        for (int j = size; j > i; j--) {
            cout << " ";
        }
        // printing alphabets
        for (int k = 0; k < i * 2 - 1; k++) {
            cout << ((char)(alpha+num++));
        }
        // set the number to 0
        num = 0;
        cout << "\n";
    }
    // downside pyramid
    for (int i = 1; i <= size - 1; i++) {
        // printing spaces
        for (int j = 0; j < i; j++) {
            cout << " ";
        }
        // printing alphabets
        for (int k = (size - i) * 2 - 1; k > 0; k--) {
            cout << ((char)(alpha+num++));
        }
        // set num to 0
        num = 0;
        cout << "\n";
    }
    return 0;
}
```


Q7- Write a program to print + pattern given below :

```
*
*
*****
*
*
```



```
Lessonplan8loops > G+ Q7.cpp > main()
1  #include <iostream>
2  using namespace std;
3
4  int main() {
5      // size of plus, use odd number
6      int size = 5;
7
8      for (int i = 0; i < size; i++) {
9          for (int j = 0; j < size; j++) {
10             // print only stars in middle row
11             if (i == size / 2) {
12                 cout << "*";
13             }
14             // other than middle row, print star only at index size/2
15             else {
16                 if (j == size / 2) {
17                     cout << "*";
18                 } else {
19                     cout << " ";
20                 }
21             }
22             cout << "\n";
23         }
24     }
25     return 0;
26 }
```

PS C:\Users\Admin\Desktop\Programs\Lessonplan8loops> cd "c:\Users\Admin\Desktop\Programs\Lessonplan8loops\" ; if (\$?) { g++ Q7.cpp -o Q7 } ; if (\$?) { .\Q7 }

```
*
*
*****
*
*
```

PS C:\Users\Admin\Desktop\Programs\Lessonplan8loops>

```
#include <iostream>
using namespace std;

int main() {
    // size of plus, use odd number
    int size = 5;

    for (int i = 0; i < size; i++) {
        for (int j = 0; j < size; j++) {
            // print only stars in middle row
            if (i == size / 2) {
                cout << "*";
            }
            // other than middle row, print star only at index size/2
            else {
                if (j == size / 2) {
                    cout << "*";
                } else {
                    cout << " ";
                }
            }
            cout << "\n";
        }
    }
    return 0;
}
```

Q8 - Write a C++ program to print a triangle of prime numbers upto given number of lines of the triangle.

Lessonplan8loops >  Q8.cpp >  main()

```

1  #include<iostream>
2  #include<conio.h>
3  using namespace std;
4  int main()
5  {
6  int x1;
7  int x2;
8  int x3;
9  int Number=3;
10 int Banner=0;
11 cout<<"Please enter the no of lines ";
12 cin>> x1;

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```

PS C:\Users\Admin\Desktop\Programs\Lessonplan8loops> cd "c:\Users\Admin\Desktop\Programs\Lessonplan8loops\" ; if ($?) { g++ Q8.cpp -o Q8 } ; if ($?) { .\Q8 }
Please enter the no of lines 6
      2
     3 5
    7 11 13
   17 19 23 29
  31 37 41 43 47
 53 59 61 67 71 73

```

```
#include<iostream>
#include<conio.h>
using namespace std;
int main()
{
int x1;
int x2;
int x3;
int Number=3;
int Banner=0;
cout<<"Please enter the no of lines ";
cin>> x1;
int d= x1;
for(x2=1;x2<= x1; x2++)
{
for(int e=1;e<=d;e++)
{
cout<<" ";
}
if(x2==1)
{
cout<<"2\n";
}
else
{
for(x3=0; x3!= x2;)
{
Banner=0;
for ( int k=2;k<Number;k++)
{
if((Number%k)==0)
Banner=1;
}
if(Banner==0)
{ x3++;
cout<<Number<<" ";
}
Number++;
}
cout<<"\n";
}
d--;
}
getch();
return 0;
}
```

Q9- Write a C++ program to check whether a Number can be expressed as a Sum of Two Prime Numbers.

```
Lessonplan8loops > Q9.cpp > main()
1  #include<iostream>
2  using namespace std;
3  int main()
4  {
5      int num, i, j;
6      int f1=1 , f2=1, f3=0;
7      cout<<"Enter a +ve Integer : ";
8      cin>>num;
9      i=3 ;
10     do
11     {
12         f1=1;
13         f2=1;
14         j=2;
15         do
16         {
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\Admin\Desktop\Programs\Lessonplan8loops> cd "c:\Users\Admin\Desktop\Lessonplan8loops\" ; if ($?) { g++ Q9.cpp -o Q9 } ; if ($?) { .\Q9 }
Enter a +ve Integer : 14
14 = 3 + 11
14 = 7 + 7
PS C:\Users\Admin\Desktop\Programs\Lessonplan8loops> \
```

```
#include<iostream>
using namespace std;
int main()
{
    int num, i, j;
    int f1=1 , f2=1, f3=0;
    cout<<"Enter a +ve Integer : ";
    cin>>num;
    i=3 ;
    do
    {
        f1=1;
        f2=1;
        j=2;
        do
        {
            if(i%j==0)
            {
                f1=0;
                j=i;
            }
            j=2;
            do
            {
                if((num-i)%j==0)
                {
                    f2=0;
                    j=num-i;
                }
                j++;
            }
            while(j<num-i );
            if(f1==1 && f2==1)
            {
                cout<<num <<" = "<<i<<" + "<<num-i<<endl;
                f3=1;
            }
            j++;
        }
        while(j<i);
        i++;
    }
    while(i<=num/2);
    if(f3==0)
    {
        cout<<num<<" can not be expressed as sum of two prime numbers.";
    }
}
```

Q10- Write a C++ program to print a rectangle out of *

```
Lessonplan8loops > Q10.cpp > ...
1  #include <iostream>
2  #include <conio.h>
3  using namespace std;
4
5  int main()
6  {
7      int StarRows,StarColumns,i,j;
8      cout<<"Please Enter the number of StarRows: ";
9      cin>>StarRows;
10     //Takes input from user for StarRows
11     cout<<"Please Enter the number of StarColumns: ";
12     cin>>StarColumns;
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\Admin\Desktop\Programs\Lessonplan8loops> cd "c:\Users\Admin\Desktop\Lessonplan8loops\" ; if ($?) { g++ Q10.cpp -o Q10 } ; if ($?) { .\Q10 }
Please Enter the number of StarRows: 2
Please Enter the number of StarColumns: 1
*
*
[]
```

```
#include <iostream>
#include <conio.h>
using namespace std;

int main()
{
    int StarRows,StarColumns,i,j;
    cout<<"Please Enter the number of StarRows: ";
    cin>>StarRows;
    //Takes input from user for StarRows
    cout<<"Please Enter the number of StarColumns: ";
    cin>>StarColumns;
    //Takes input from user for StarColumns
    for(i=1; i<=StarRows; i++){//outer for loop
        for (j=1; j<=StarColumns; j++){//inner for loop
            cout<<"*";//print star
        }
        cout<<"\n";//move to next line
    }
    getch();
    return 0;
}
```