



**Q1.** Write C++ program to make such a pattern like right angle triangle using while statement.

```
Enter number of rows: 5
5 4 3 2 1
4 3 2 1
3 2 1
2 1
1
```

**Q2.** Observe the following C++ code carefully and rewrite the same after removing all the syntax error(s) present in the code. Ensure that you underline each correction in the code.

```
const float PI;
PI=3.14;
INT radius;
cout<<'enter a radius"<<endl;
cin>radius
double area=radius*radius*pi;
cout<'The area cicle is'<<"\t"<<
area<\n;
```

**Q3.** Write the output for the following piece of program.

```
int n=4, i=0,j;
do
{
j=0;
do
{
switch(i==j){
case true:cout<<3<<" ";break;
case 0:
if(i+j>=n)
cout<<2<<" ";
else if(j+i==n-1)
cout<<1<<" ";
else
cout<<0<<" ";
}
j++;
}while(j<n);
i++;
cout<<endl;
}while(i<n);
```

**Q4.** Write a C++ program that reads one dimension array ( $A_n$ ), and then swap the minimum element with the last element of the array.

```
Enter size of array: 7
Enter elements of the array: 6 1 2 7 3 4 0
Array before find min: 6 1 2 7 3 4 0
Array after find min: 6 1 2 0 3 4 7
```

**Q5.** Write C++ program to find the sum of **odd** digits of a given number using **do...while** statement.

```
Enter a number: 37638
The sum of odd digits is: 13
```

**Q6.** Write C++ program to print the following pattern using **while** statement.

```
Enter Number of rows: 5
      10
     13 16
    19 22 25
   28 31 34 37
  40 43 46 49 52
```

**Q7.** Write a C++ program to read an array ( $A_n$ ) then sum all elements divisible by 3.

```
Enter size of array: 6
Enter elements of array: 2 4 3 6 7 9
The elements that divisible by 3 is: 3 6 9
The sum elements that divisible by 3 is: 18
```

**Q8.** Write a C++ program that reads square matrix ( $A_{n \times n}$ ), then find and print the average of the elements of below opposite diagonal. Display the output below exactly as shown

```
Enter number of rows and columns: 4
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Matrix
10 11 12 13
14 15 16 17
18 19 20 21
22 23 24 25
The average of the elements of below opposite diagonal is: 21.6667
```

**Q9.** Write C++ program to add 2 to **even** digits of a given number using **while** statement.

```
Enter a number: 345312
The number add 2 for even digits is: 365314
```

**Q10.** Write a program in C++ to find the result of the following series using **do...while** statement.  $(5 + 55 + 555 + 5555 + \dots n \text{ terms}) / n \text{ terms}^2$ . Display the output below exactly as shown.

```
Input number of terms: 6
(5+55+555+5555+55555+555555)/6^2
The result of the series is: 17146.7
```

**Q11.** Write a C++ program that reads square matrix (Anxm), then swap first column with first row. Display the output below exactly as shown.

```
Enter number of rows and columns: 3
1 2 3 4 5 6 7 8 9
Matrix before swap
1 2 3
4 5 6
7 8 9
Matrix after swap first column with first row
1 4 7
2 5 6
3 8 9
```

**Q12.** Write the output for the following piece of program.

```
int n=4,c,i,j;
for(i=0; i<n; i++)
{
    for(j=0; j<=i; j++)
    {
        switch(j==0||i==0)
        {
            case 0:
                c*=(i-j)+1;
                break;
            default:
                c=2;
        }
        cout<<c<<"\t";
    }
    cout<<endl;
}
```

**Q13.** Write C++ program to find the sum of **even** digits of a given number using **function**.

```
Enter a number: 941623
The sum of even digits is: 12
```

**Q14** Write a C++ program that reads a square matrix (Anxn), then find and print the max number of main diagonal and opposite diagonal.

```
Enter number of rows and columns: 4
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
Matrix
1 2 3 4
5 6 7 8
9 0 1 2
3 4 5 6
The max number of main diagonal and opposite diagonal is: 7
```

**Q15** Observe the following C++ code carefully and rewrite the same after removing all the syntax error(s) present in the code. Ensure that you underline each correction in the code.

```
int x=4;

int main()
{
const int x=4;
int k=0;
::x=0
x>::x;
char arr[x]=("a";"b";"c";"d"),
k=x;
while[k>::x]{
cout<arr(k)<\n;
k--;
}
return 0;
}
```

**Q16.** Write the output for the following piece of programs.

<pre>#include &lt;iostream&gt; using namespace std; int x =20; int f() {     x-=2;     return --x; } int g() {</pre>	<pre>int x = 50; x++; return f(); } int main() {     while(x%3&gt;=1)         cout&lt;&lt;g()&lt;&lt;"\t";     return 0; }</pre>
--	--

**Q17.** Write the output for the following piece of programs.

```
int i, x[5], y=0, z[5];
for (i = 0; i < 5; i++) {
    x[i] = i;
    z[i] = i + 3;
    y += z[i];
    x[i] = y++;
}
for (i = 0; i < 5; i++)
    cout << x[i] << " ";
```

**Q18.** Write a C++ program to read elements of a matrix and swap elements of opposite diagonal with last row as shown below.

Array before swap	Array After swap opposite diagonal with last row
1    2    3    4	1    2    3    16
5    6    7    8	5    6    15   8
9    10   11   12	9    14   11   12
13   14   15   16	13   10   7    4

**Q19.** Write a C++ Program to find sum of odd digits of an integer number **using function**

```
Input a number: 347132
The sum of digits is : 14
```

**Q20.** Draw a flowchart to find the Greatest Common Divisor (GCD) of two numbers that are greater 35.

**Q21.** Draw a flowchart to check Matrix is an Identity Matrix.

Hint: An Identity Matrix is a square matrix whose main diagonal elements are ones, and all the other elements are zeros.

**Q22.** Write the output for the following piece of programs.

```
for(int i=0; i<20; i++)
{
    switch(i)
    {
        case 0: i+=5;break;
        case 1: i+=2;break;
        case 5: i+=5;break;
        default: i+=4; break;
    }
    cout<<i++<<" ";
}
```

**Q23.** Write the output for the following piece of programs.

```
#include <iostream>

using namespace std;

int max(int x, int y, int z)
{
    if (x > y && y > z)
    {
        y++;
        z++;
        return x++;
    }
    else
    {
        if (y > x)
            return y++;
        else
            return z++;
    }
}

int main()
{
    int A, B;
```

```

int a = 10, b = 13, c = 8;
A = max(a, b, c);
cout << a++ << " " << b-- << " " << ++c << endl;
B = max(a, b, c);
cout << ++A << " " << --B << " " << c++ << endl;
return 0;
}

```

**Q24.** Write a C++ program to read elements of a matrix then find the sum of minimum elements of each column as shown below.

```

Enter number element of row and column: 4 4
Enter Elements of matrix: 11 21 23 41 53 66 74 89 90 10 11 12 13 14 15 16
11 21 23 41
53 66 74 89
90 10 11 12
13 14 15 16
Minimum of each column: 11 10 11 12
Sum of minimum elements of each columns:44

```

**Q25.** Write a C++ program to count numbers that are divisible by a number in an array of integer numbers **using function**.

```

Original array: 5 12 8 9 5 8 39 6
Enter a number: 3
Numbers that are divisible by 3 is : 4

```

**Q26.** Draw a flowchart to check whether a number is prime or not.

**Q27.** Draw a flowchart to find factorial all numbers between 5 and 20 that are not divisible by 3.

**Q28.** Write C++ program to find and count prime numbers between two numbers using while statement.

Example:

Enter first number: 4

Enter second number: 15

Prime numbers between 4 and 15 are 5, 7, 11 and 13

The total prime numbers is 4

**Q29** Write the output for the following piece of program.

```
const int n=5;
for(int i=0; i<n; i++)
{
    for(int j=0; j<n; j++)
    {
        if(i==j)
            cout<<1<<" ";
        else if(i+j==n-1)
            cout<<2<<" ";
        else if(i+j>=n)
            cout<<3<<" ";
        else
            cout<<0<<" ";
    }
    cout<<endl;
}
```

**Q30.** Write a C++ program to find and print an average of three numbers if they are all positive and even. The program should also check whether the first number is multiple the sum of the second and third numbers or not.

**Q31.** Rewrite the correct form of the following piece of program.

```
int main()
{
    char x;
    int _num1, result
    x="a";
    cin<<_num1;
    result=4+8*2;
    cout<<"x= "<< x , "result ="<< result;
    cout<<endl;
    return 0;
}
```



**Q32.** Write the output for the following piece of program.

```
int y=13, x=25/5*5%3+5;
double res = y/4;
cout<<"X= "<<x<<endl<<"result= "<<res;
```

**Q33.** Draw evaluation trees for the following

$\text{flag}=(x/2)>3 \parallel x\%y<3 \ \&\& \ -x+y== -3$

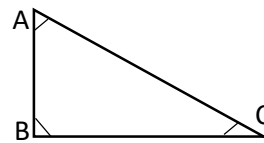
**Q34.** Write a C++ program to read two string and check whether the number of letters first string is equal, more, or less than the number of letters second string.

**Q35.** Write a C++ program to read seconds and convert them to hours and days.

**Q36.** Write a C++ program to read an operator (\*, /) and two numbers. The program should do the multiplication for the two numbers if you entered \* operator and do division if you enter / operator.

**Q37.** Write a program in C++ to read two angles of a triangle and find the third angle.

Where sum of Three angles  $A + B + C = 180$



**Q38.** Write a C++ program to read two numbers then find and print quotient and remainder of them.

Example: first number = 33, second number = 7  $\rightarrow$  Quotient =  $33/7 = 4$  remainder = 5

**Q39.** Write a C++ program to swap two numbers if the first number is between 10 to 100 (inclusive) or the second number is negative, otherwise, find and print the sum of the two numbers using if else structure.

**Q40.** Write a C++ program that reads an integer number, then print whether the number is even or odd using switch case.

**Q41.** Fill in the following blanks.

1. The extension of an object file after compiling a program is \_\_\_\_\_.
2. If we do not use (*using namespace std;*), then we need to use \_\_\_\_\_ as a prefix every time we use each of “cout”, “cin” and “endl”.
3. Assembly Language Translated to machine language by \_\_\_\_\_.
4. Comments removed by \_\_\_\_\_ before source file is sent to the compiler.
5. Identifiers starts with a \_\_\_\_\_ or \_\_\_\_\_.
6. Execution errors detected when you \_\_\_\_\_ the program.
7. The loader loads the program from the \_\_\_\_\_ into \_\_\_\_\_.

**Q41.** Write the output for the following piece of programs.

```
int a = 5.3;
int b = 10.5;
a = a * b;
b = a / b;
a = a / b;
cout << "a = " << a << ", b = " << b << endl;
```

**Q42.** Write the output for the following piece of programs.

```
string sent1, sent2, QA;
sent1="Where are you from";
sent2="I'm from Kurdistan";
QA=sent1+"\n"+sent2;
if(!sent2.empty())
    {cout<<QA;
    cout<<"\nThe number of letters is:"<<QA.length();}
cout<<"\nThe number of letters first sentence is:"<<sent1.length()<<endl;
```

**Q43.** Observe the following C++ code carefully and rewrite the same after removing all the syntax error(s) present in the code. Ensure that you underline each correction in the code.

```
int main()
{
    const int x;
    float result;
    cout<<enter a number<<endl;
    cin>number
    x=5;
    result=number*x;
    cout << "Size of char: " << size of(char) << " byte" endl;
    cout< result<"\n";
    string 1_str="hello", 2_str = "Sara";
    cout<<1_str+' '+2_str<<endl;
    return 0;
}
```

**Q44.** Write a C++ program that reads three numbers and sort them in descending order using if..else structure.

**Q45.** Write a C++ program that reads two integer numbers, the program should test the second number if it is multiple of the first number using switch case.

**Q46.** Choose the best correct answer.

1. Which operator has highest precedence in \* / % ?  
A. \*            B. /            C. %            D. all have same precedence
2. Special symbol permitted within the identifier name.  
A. \$            B. @            C. \_            D. -
3. Which of the following comment syntax is correct to create a single-line comment in the C++ program?  
A. //Comment    B. /Comment/    C. Comment//    D. None of the above
4. C++ is a \_\_\_ type of language.  
A. High-level Language    B. Low-level language    C. Middle-level language    D. None of the above

**Q47.** Draw evaluation trees for the following:

$z = (x + y) / a - b * -y;$

**Q48.** Write the output for the following piece of programs.

```
if(0)
    cout<<"Hi";
else
    cout<<"Bye";
string x = "10";
string y = "20";
string z = x + y;
cout<<endl<<"X="<<x<<endl<<"Y="<<y<<endl<<"Z="<<z<<endl;
```

**Q49.** Write the output for the following piece of programs.

```
int x=12.5;
if((x==12.5&&x%2==0)||1)
    cout<<"Result = "<<x/2.0<<endl;
else
    cout<<"Result = "<<x+10.5<<endl;
```

**Q50.** Observe the following C++ code carefully and rewrite the same after removing all the syntax error(s) present in the code. Ensure that you underline each correction in the code.

```
int main()
{
Const string _name1="Aram";
int length=0
length=_name1.length;
if(_name1.empty)
{cout<<'The string is not empty'<<\n;
else
{cout<<'My name is:'<<\t<<_name1<endl;
cout<<"The length is:"<<length;}
return 0;
}
```

**Good Luck!**

**Instructor**  
**Diyar A. Abdulqader**