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1. Write a C++ program to display the following statement
    a. My name
    b. Welcome in programming language
    c. I'm a student
       My combination is IT and Management
       I will become a good programmer
2. What does the following code print to the screen?

```
cout<<"*\n**\n***\n****\n*****\n";
```

3. Write a program which calculate:
    - The sum of 3 and 10
    - The product of 2 and 10
    - The quotient(division) of 20 and 2
    - The modula of 100 and 9
4. Write a program which calculate
    - The sum of two numbers
    - The product of two numbers
    - The quotient of two numbers
    - The modula of two numbers
5. What will be the output of this program

```
#include<iostream.h>
int a,b;
a=10;
b=4;
a=b;
b=7;
a=a+b;
cout<<"a:";
cout<<a<<endl;
cout<<"b:";
cout<<b;
return 0;
}
```

6. Assume that you have the following C++ program

```
#include<iostream.h>
main()
{
        Int a,b;
       cout<<"Enter a number:";
       cin>>a;
       b=(a>5 ? 3:4);
      cout<<b;
}
```

    a. What will be the output of this program if a user input 2
    b. What will be the output of this program if a user input 9
    c. What will be the output of this program if a user input -1
    d. What will be the output of this program if a user input 8
    e. What will be the output of this program if a user input 4
    f. What will be the output of this program if a user input 6
7. With examples, Explain, draw the logical gate and the truth table of the following logical operators
    a. !
    b. &&
    c. ||
8. What will be the output of these programs

A)

```
#include<iostream.h>
main()
    {
cout<<"Condtion :Return Values\n";
    int i=5>3 && 3<2;
    cout<<"\n 5>3 && 3<2 : \t" <<i;
    int x=8>5 || 8<2;
```

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```
    cout<<"\n 8>5 || 8<2   :\t"<<x;
    int y=8<2 || 8>5;
    cout<<"\n 8<2 ||8>5       :\t"<<y;
    int a=!(4==4);
    cout<<"\n !(4==4)     :\t" <<a;
    int s=!(3<8);
    cout<<"\n !(3<8)          :\t" <<a;
}
```

B)

```
#include<iostream.h>
#include<conio.h>
main()
    {
int x=2;
float y=2;
clrscr();
cout<<"\n size of (x):"<<sizeof(x);
cout<<"\n size of (y):"<<sizeof(y);
     }
```

9. What will be the output of these programs

A)

```
#include<iostream.h>
main()
{
Int n;
cout<<(n=4)<<endl;
cout<<(n==4)<<endl;
cout<<(n>3)<<endl;
cout<<(n<4)<<endl;
cout<<(n=0)<<endl;
cout<<(n==0)<<endl;
cout<<(n>0)<<endl;
cout<<(n&&4)<<endl;
cout<<(n||4)<<endl;
cout<<(!n)<<endl;
return 0;
}
```

B)

```
#include<iostream.h>
main()
{
Int a,b,c,d,e
a=4;
b=6;
a=6;
b=8;
c=(a>b)&&(a<b);
d=(a>b)||(a<b);
e=(b>=a)||(a<=b);
cout<<a<<endl;
cout<<b<<endl;
cout<<c<<endl;
cout<<d<<endl;
cout<<e<<endl;
```

C.

```
#include<iostream.h>
main()
{
Int a=2;
Int b=4;
Int c,d;
c=++a;
d=b++;
a=++c;
b=a++;
c=(++a)*(b++);
cout<<a;
cout<<b;
cout<<c;
cout<<d;
}
```

D)

```
#include<iostream.h>
main()
{
int x=4;
int y=2;
```

```
int z;
z=(++x)*(y++);
cout<<++x;
cout<<y++;
cout<<++z;
}
```

E)

```
#include<iostream.h>
main()
{
 int n,k=5;
n=(100%k ? k+1 : k-1);
cout<<"n="<<n<<"k="<<k<<endl;
return 0;
}
```

F

```
#include<iostream.h>
main()
{
  int n, k=5;
  n=(100%k ? k+1: k-1);
cout<<"n="<<n<<"k="<<k<<endl;
return 0;
}
```

G.

```
#include<iostream.h>
main()
{
int n;
float x=3.8;
n=int(x);
cout<<"n"<<n<<endl;
return 0;
}
```

10. Suppose that we have 3 variables: A, B and C. Write a program C++ to transfer to B the value of A, to C the value of B and to A the value of C (SWAP).
11. Write a program to calculate and display the distance between two points in Cartesian plan. Distance= $\sqrt{(x - x) + (y - y)}$
12. Write a program, to calculate and display the volume of the sphere. Volume=$\frac{4}{3}$
13. Write a program which calculates the area of a rectangle.
14. Write a program which show if the number entered from the keyboard is a positive number.
15. Write a program which show if the number entered from the keyboard is an odd number.
16. Write a program which show if the number entered from the keyboard is a greater than 5 number.
17. Write a program which show if the number entered from the keyboard is a between 19 and 30.
18. Write a program which show if the number entered from the keyboard is a multiple of 3.
19. Write a program which show if the number entered from the keyboard is a positive number or a negative number.
20. Write a program which show if the number entered from the keyboard is an even number or an odd number.
21. Write a program which show if the number entered from the keyboard is a between 19 and 30 or not.

22. Write a C++ program to input two numbers from the keyboard and subtract the lowest number to a largest number.
23. Write a program which enter two numbers and show the biggest.
24. Write a program which enter two numbers and show the smallest.
25. Write a program which enter five numbers and show the biggest.

26. Write a program which inputs three numbers and outputs the message sorted if the numbers are in ascending order, and outputs not sorted otherwise.

27. Write a program to resolve the equation of second degree(Quadratic equation)($ax^2+bx+c=0$)
28. Write a program to calculate the total cost of the vehicle by adding basic cost with
    a. Sales taxes: 10% of the basic cost
    b. Road tax: 2% of the basic cost
    c. Insurance tax: 15 % of the basic cost
29. Write a program to calculate the basic cost of the vehicle by reducing total cost with
    a. Sales taxes: 10% of the total cost
    b. Road tax: 2% of the total cost
    c. Insurance tax: 15 % of the total cost
30. Write a the starting and ending meter reading the charges are as follows

No of Units Consumed	Rates in (FRW)
200-500	3.50
100-200	2.50
Less 100	1.50

31. Write a program in C++ that asks a user to enter ages of child, then inform his category according to the entered age:

    "Poussin" from 6 to 7 Years
    "Pupille" from 8 to 9 Years
    "Minime" from 10 to 11 Years
    "Cadet" above 12 years

32. Write a program to find the lowest number out of five numbers inputted from the keyboard.

33. Write a program to calculate gross salary for the conditions given below. The program should display the basic salary, house rent allowance value, daily allowance value, transport allowance value and gross salary. You must use the following conditions

BS (FRW)	HRA	DA	TR
>=5000	20% of Basic S	100% of Basic S	500
Bs>3000 and Bs<5000	15% of Basic S	80% of Basic S	400
Bs<3000	10% of Basic S	60% of Basic	200

Key used: Bs= Basic salary, DA= daily allowance, HRA= House rent allowance, TR= Transport allowance

34. Write a program to find the average of 4 subjects and display the grade obtained through the following conditions

If Average>34 and <50 the grade will be “A”

If Average>49 and <60 the grade will be “B”

If Average>60 and <75 the grade will be “C”

If Average>75 and <100 the grade will be “D”

If Average<35 the grade will be “E”

35. Design an application to compute the commission earned by a sales man.

The application should display the sales volume and the commission earned using the following conditions:

If Sales Volume is <500 Commissions rate is 2% of Sales volume

If Sales Volume is <1000 Commissions rate is 4% of Sales volume

If Sales Volume is <2000 Commissions rate is 6% of Sales volume

If Sales Volume is <5000 Commissions rate is 8% of Sales volume

If Sales Volume is >5000 Commissions rate is 10% of Sales volume

The program should display the name of the sales person, sales volume and the commission earned

36. A Company insures its drives in the following cases

If the driver is married

If driver is unmarried, male and he is above 39 years of age

If driver is unmarried, female and he is above 25 years of age

In all the other cases the driver is not insured. If the marital status, sex and age of the driver are the inputs, write a program to determine whether the driver is to be insured or not.

37. What will be the output of this program?

```
#include<iostream.h>
main()
{
int n=6;
if(n=0)
cout<<”n is zero”<<”.\n”;
else
cout<<”The square of n is”<<n*n<<”.n”;
return 0;
}
```

38. After executing this program answer all the questions about it

```
#include<iostream.h>
main()
{
int number;
cout<<”Enter number:”;
cin>>number;
if(n<10)
```

```
cout<<"less than 10"<<endl;

else if(n>5)

cout<<"greater than 5"<<endl;

else

cout<<"Not interesting";

return 0;

}
```

a) What will be the output if a user input 0
b) What will be the output if a user input 7
c) What will be the output if a user input 15
d) What number can be input so that a program display Not interesting?

39. Write a program in c++ which do the following:

a. When a user press 1 the program should display the addition of two numbers
b. When a user press 2 the program should display the multiplication of two numbers and the division of the first number by the second
c. When a user press 3 the program should display the subtraction of the largest number by the lowest number
d. When a user press 4 the program should display the largest number between three numbers entered from the keyboard
e. When a user press 5 the program should display whether a number entered from the keyboard is old or even number

40. Write a program using select case which do the following:

f. When a user press 1 the program should display the addition of two numbers
g. When a user press 2 the program should display the multiplication of two numbers and the division of the first number by the second
h. When a user press 3 the program should display the subtraction of the largest number by the lowest number
i. When a user press 4 the program should display the largest number between three numbers entered from the keyboard
j. When a user press 5 the program should display whether a number entered from the keyboard is old or even number

41. What will be the output of this time

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```
#include<iostream.h>
main()
{
int choise;
cin>>choise;
switch(choise)
{
case 1:
```

A) What will be the output of this if a user press 1
B) What will be the output of this program if a user press 2
C) What will be the output of this program if a user press 3
D) What will be the output of this program if a user press 4
E) What will be the output of this program if a user press 5
F) What will be the output of this program if a user press 6
G) What will be the output of this program if a user press 7

```
cout<<"A";
break;
case 2:
cout<<"B";
break;
case 3:
cout<<"C";
case 4:
```

H) What will be the output of this program if a user press B

42.

a)

```
#include<iostream.h>
main()
{
char answer;
cin>>answer;
switch(answer)
cout<<"D";
case 5:
cout<<"E";
break;
case 6:
cout<<"F";
default:
cout<<"Bad choose";   }
    {
    case 'a':
    cout<<"RWANDA";
    break;
    case 'b':
    cout<<"BURUNDI";
    break;
    case 'c':
    cout<<"UGANDA";
    case 'D':
    cout<<"TANZANIA";
    case 'E':
    cout<<"DRC";
    defout:
    cout<<"This country is not in Ester Africa";
    } }
```

What will be the output of this program :

1. If a user press a
2. If a user press b
3. If a user press c
4. If a user press d
5. If a user press e
6. If a user press f
7. If a user press 2
8. If a user press k

b)

```
#include<iostream.h>

main()

{

int ch;

cout<<"press 1 to choise addition";

cout<<"press 2 to do multiplication";

cout<<"press 3 to do substraction";

cout<<"press 4 to do substraction";

cout<<"Enter your choise";

cin>>ch;

switch(ch)

{

case 1:

cout<<"choose division";

case 2:

cout<<"choose addition";

break;

case 3:

cout<<" subtraction";

case 4:

cout<<"multiplication";

default:

cout<<"Not operator" } }
```

a) What will be the output if a user press 1
b) What will be the output if a user press b
c) What will be the output if a user press 3
d) What will be the output if a user press 2
e) What will be the output if a user press 4
f) What will be the output if a user press 5

43. In a company an employee is paid as ender:

If his basic salary is less than 15000, then

HRA=10% of basic salary

TA=90% of basic salary

If his salary is either equal to or above frw 15000, then

HRA= FRW 500

TA=95% of basic salary. If the employee's basic salary is input through the keyboard write a program to find his gross salary.

44. A certain grade of steel is graded according to the following conditions.

a. Hardness must be greater than 50
b. Carbon content must be less than 0.7
c. Tensile strength must be greater than 5600

The grades are as follows

Grade is A if all three conditions are met

Grade is B if a conditions (1) and (2) are met

Grade is C if conditions (2) and (3) are met

Grade is D if conditions (1) and (3) are met

Grade is E if only one condition is met

Grade is F if no one of the condition is met.

45. Write a program which displays your name 190 times.
46. Write a program to display this series of numbers in ascending order(1,2,3,4,5,6,7,8,9)
47. Write a program to display this series of numbers in descending order(1,2,3,4,5,6,7,8,9)
48. Write a program to display this series of numbers in descending order(1,3,5,7,9)
49. Write a program to display the following series of numbers(1,2,3,4,6,7,8,9) (bifurcation instruction)
50. Given the following numbers:1,2,3,4,5,6,7,8,9,10
    Write a program which displays the four first numbers of them (bifurcation instruction).
51. Write a program to display the addition of integers , from 1 to 10
52. Write a program to display the multiplication of the integers from 35 to 69
53. Write a program to display the addition of 100 integers entered from the keyboard.
54. Write a program to calculate the factorial of 100
55. Write a program to calculate the factorial of a given number(Entered from the keyboard)
56. Write a program to display the old numbers within the numbers from 1 up to 100
57. Write a program to display the even numbers within the numbers from 1 up to 200
58. Write a program to calculate and display the sum of the old number within the first 10 integers
59. Write a program to calculate and display the sum of the even numbers within the first 20 integers
60. Write a program which will help a user to input all the old numbers less than or equal to 100 and display their sum on the screen
61. Write a program that calculate and displays the double, triple, square and cube of the numbers from 1 to 4

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Example of the output expected:

Number	double	triple	square	cube
1	2	3	1	1
2	4	6	4	8
3	6	9	9	27
4	8	12	16	64

62. Write a program to input a number from the keyboard and display it table of multiplication
63. Write a program to display a table of multiplication of integer numbers from 1 up to 12
64. Write a program to display a table of multiplication of integer numbers from a given number up to 12.
65. Write a program which shows the calendar of this year. (from January to December)
    N.B:30 days by each month.
66. Write a program which shows the calendar from 2000 to 2003.
67. Using loop, write a program to display the following:

```
*          ***        ***          *

**         **         **           **

***        *          *            ***
```

68. Write a program which will help a user to input all the old numbers less than or equal to 100 and display their sum on the screen
69. Of sos.
70. Sort 10 integers in ascending order.
71. Sort 10 integers in descending order.
72. Write a program in algorithm, C++ which asks a user to enter a starting number then, display 10 next numbers and its sum. For example, if a user enters 17, the program will display numbers 18 to 27 and its sum.
73. Write a program in C++ and flowchart which asks a user to enter N, and calculates a sum of integers up to that number.
    For e.g if he enters 5, the program will calculate 1 + 2 + 3 + 4 + 5 = 15

74. Write a program in C++ which asks a user to enter 20 numbers,
    And then display the greatest number.
75. Same as above, but this time, we don't know how much numbers a user wants to enter. He will stop to enter numbers if he type Zero, otherwise he will continue to enter numbers.
76. Write a program in C++ to calculate an average of even numbers entered by a user.

77. Write a program in C++ that asks a user to enter a number then display a sum of its digit. For e.g. if a user enters 456, the output will be: 4+5+6=15.
78. Write a program in C++ that asks a user to enter a number, and then display that number in inverse order. For e.g. 456= 654
79. Write a program that read 10 numbers in one dimensional array.
80. Write a program the read and write 100 numbers and calculate their sum.
81. Write a program that calculates the sum and the average of 200 numbers in one dimensional array.
82. Write a program in a C++ to enter 20 numbers in array called TAB then display the maximum number of that array.
83. Write a program in C++ to enter 15 numbers in array called K then displays the minimum number of that array and its position (index).
84. Write a program to enter 21 numbers in array called Z then display the entered numbers in that array in inverse order.
85. Write a program that sort 15 numbers in array of one dimension.
86. Given the following array name and elements write a program to display the following

Array name	Array elements
Num	10,50,2,80,4,2,1,6,5,15

- Using Bubble sort, sort the array elements in
- Ascending order
- Descending order
- Find and display largest and smallest array element
- And there positions

87. Display reversed array element
88. Write a program to store the ages of your family members in an array of pointers. Print those ages on the screen
89. Write a program that asks the user to enter 15 float prices of items. Use the pointer notation to print on the screen the elements of that array.
90. Write a teachers program that keeps track of 10 ages, letter grades. Use 10 different structure variable names and get the data for the students in a for loop form the keyboard.

91. Write a program for a mail order company those sales disk drives. The program keeps track of 125 different disk drives. The following information should be kept track of.

    - Storage Capacity in Megabytes
    - Access time in milliseconds
    - Vendor code (A,B,C, or D)
    - Cost
    - Price.

92. Write a program which inputs a positive integer *n* and outputs 2 raised to the power of *n*.
93. Write 3 functions that reads 10 numbers from the key board. Using bubble sort, sort the numbers in ascending order, and in descending order. Display the two sorted output on the screen
94. Write a program, using the functions and arrays to read in 10 numbers from through the keyboard, then sorts the numbers using bubble sort method, in ascending order, and. The program should display the unsorted numbers and the sorted numbers.
95. Write a function to accompany your structure which takes a box as a parameter and sets its volume variable based upon its height, length and width. The volume is these three multiplied together. Write another function which sets the surface area in the same way (equal to twice the length times the height, plus twice the width times the height, plus the length times the width).
96. Write a program, using the functions and arrays to read in 10 numbers from through the keyboard, then sorts the numbers using bubble sort method, in ascending order, and. The program should display the unsorted numbers and the sorted numbers.
97. Write a function that takes two integers arguments and returns the result of dividing the first by the second. Do not do the division if the second number is zero, but return -1
98. Write a program containing two functions that return values. The first Function returns the higher of two numbers entered by the user. The second Function returns the lowest number. The parameters for the two functions are entered through the main function.
99. Write a program to call two functions. - One which prints the numbers from 1 to 10 and the other which prints the numbers from 10 down to 1. (Each function will use a loop). The functions should be self contained, that as, any variables needed for printing the numbers should be declared *inside* the function.

100. Write a function which displays the following "*Begin with the end in mind*".