

## L3: Conditionals and Loops Practice Questions

### 1-Tut : What is the output

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```
#include <iostream>
using namespace std;
int main()
{
    int x = 5;
    if (x < 6)
        cout << "Hello ";
    if(x == 5){
        cout << "Hi ";
    }
    else {
        cout << "Hey ";
    }
}
```

### Options

This problem has only one correct answer

[Hello](#)

[Hi](#)

[Hello Hi](#)

[Hello Hey](#)

Correct Answer : c

### Solution Description

First if condition is true, so "Hello " will be printed. After that, next if condition will be evaluated (as both if's are independent if's) which is again true. Hence, next "Hi " will be printed (obviously in same line). We won't go inside else, as if is already executed.

### 2-Tut : What is the output

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```
#include <iostream>
using namespace std;
int main() {
    int x = 15;
    if(x <= 15) {
        cout << "Inside if ";
    } else if(x == 15) {
        cout << "Inside else if ";
    }
    cout << x;
}
```

## Options

This problem has only one correct answer

Inside if

15

Inside if Inside else if 15

Inside if 15

Correct Answer

## Solution Description

The condition inside if is true, hence the statement "Inside if" will be printed. After that, we'll directly jump to the statement : cout << x. So, after that 15 will be printed.

### 3-Tut: What is the output

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```
#include <iostream>
using namespace std;
int main()
{
    int var1 = 5;
    int var2 = 6;
    if ((var2 = 1) == var1)
        cout << var2;
    else
        cout << (var2 + 1);
}
```

## Options

This problem has only one correct answer

7

1

2

6

Correct Answer

## Solution Description

Inside if condition, we are doing if((var2 = 1) == var1), So first 1 will be assigned to var2 and then it'll be compared with var1. Before comparison, var2 = 1 and var1 = 5, which are not equal. So, we'll move to else part and there the value of (var2 + 1) i.e. 2 will be printed.

### 4-Tut : If statement

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For what values of the x is an if-statement block not executed ?

```
if((1+x) != (1-x)) {
    cout<<"In if block";
}
```

```
}
```

## Options

This problem has only one correct answer

0 and all negative values

0 and -1

0, all negative values, all positive values except 1

0

Correct Answer : D

## Solution Description

The if-statement block is only not executed when the value of x is 0. For all other values, it will be treated as true.

### 5-Tut: What is the output

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```
#include <iostream>
using namespace std;
int main() {
    int a = 10, b = 20, c = 100;
    if(a <= b || c <= b) {
        cout << "hello" << endl;
    }
    else if(a <= b || a <= c) {
        cout << "hi" << endl;
    }
    else {
        cout << "hey" << endl;
    }
}
```

## Answer

Type here : hello

Correct Answer : hello

## Solution Description

In if condition, we are using logical OR operator ("||"). So if even one condition is true, final answer will be true.

### 6-Tut : What is the output

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```
#include <iostream>
using namespace std;
int main() {
    int a = 10, b = 20, c = 30;
    if(a <= b && !b) {
        cout << "hello";
    }
    else if(c >= a && c >= b) {
        cout << "hi";
    }
}
```

```

    }
    else {
        cout << "hey";
    }
}

```

## Answer

Type here : hi

Correct Answer

## Solution Description

$a \leq b$  evaluates to true, but  $!b$  evaluates to false (! operator negates the value, b is non-zero and hence  $!b$  becomes 0 which is false). For AND operator ("&&"), all the condition must be true. So we'll move to else if condition which evaluates to be true as both conditions ( $c \geq a$  and  $c \geq b$ ) are true. Hence, "hi" will be printed.

## 7-Tut : Check Case

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Write a program that takes a character as input and prints either 1, 0 or -1 according to the following rules.

1, if the character is an uppercase alphabet (A - Z)

0, if the character is a lowercase alphabet (a - z)

-1, if the character is not an alphabet

### Input format :

Single Character

**Output format :** 1 or 0 or -1

**Constraints :** Input can be any character

**Sample Input 1 :** v

**Sample Output 1 :** 0

**Sample Input 2 :** V

**Sample Output 2 :** 1

**Sample Input 3 :** #

**Sample Output 3 :** -1

```

1. #include<iostream>
2. using namespace std;
3.
4. int main() {
5.     // Write your code here
6.     char c;
7.     cin >> c;
8.     if(c >= 'A' && c <= 'Z'){
9.         cout << 1 ;
10.    }else if(c >= 'a' && c <= 'z'){
11.        cout << 0;
12.    }else {

```

```
13.     cout << -1;
14. }
15.
16.
17. }
```

## 8-Tut : Sum of Even Numbers till N

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Given a number N, print sum of all even numbers from 1 to N.

**Input Format :** Integer N

**Output Format :** Required Sum

**Sample Input 1 :** 6

**Sample Output 1 :** 12

```
1.
2. #include<iostream>
3. using namespace std;
4.
5. int main(){
6.
7.     /*
8.         Read input as specified in the question.
9.         Print output as specified in the question.
10.    */
11.    int N,sum = 0,ceven = 0;
12.    cin >> N;
13.    while(ceven <= N){
14.        sum = sum + ceven;
15.        ceven = ceven + 2;
16.    }
17.    cout << sum ;
18. }
```

## 9-Tut: Fahrenheit to Celsius Table

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Given three values - Start Fahrenheit Value (S), End Fahrenheit value (E) and Step Size (W), you need to convert all Fahrenheit values from Start to End at the gap of W, into their corresponding Celsius values and print the table.

**Input Format :**

3 integers - S, E and W respectively

**Output Format :**

Fahrenheit to Celsius conversion table. One line for every Fahrenheit and corresponding Celsius value. The Fahrenheit value and its corresponding Celsius value should be separate by single space.

**Constraints :** $0 \leq S \leq 80$  $S \leq E \leq 900$  $0 \leq W \leq 40$ **Sample Input 1:**

```
0
100
20
```

**Sample Output 1:**

```
0 -17
20 -6
40 4
60 15
80 26
100 37
```

**Sample Input 2:**

```
20
119
13
```

**Sample Output 2:**

```
20 -6
33 0
46 7
59 15
72 22
85 29
98 36
111 43
```

**Explanation For Input 2:**

Start calculating the Celsius values for each Fahrenheit Value which starts from 20. So starting from 20, we need to compute its corresponding Celsius value which computes to -6. We print this information as

<Fahrenheit Value> <a single space> <Celsius Value> on each line. Now add 13 to Fahrenheit Value at each step until you reach 119 in this case. You may or may not exactly land on the end value depending on the steps you are taking.

```
1. #include<iostream>
2. using namespace std;
3. int f2c(int f){
4.     return (5.0/9)*(f-32);
5. };
6.
7. int main(){
8.
9.     /* Read input as specified in the question.
10.    * Print output as specified in the question.
11.    */
12.     int S, E , W;
13.     cin >> S >> E >> W;
14.     int f = S;
15.     while(f <= E){
16.         cout << f << " " << f2c(f) << endl;
17.         f = f+ W;
18.
19.     }
20. }
21.
22.
```

## 10-Tut: Number Pattern 1

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Print the following pattern

Pattern for N = 4

```
1
23
345
4567
```

**Input Format :**

N (Total no. of rows)

**Output Format :**

Pattern in N lines

**Sample Input 1 :** 3

**Sample Output 1 :**

```
1
23
345
```

```

1. #include<iostream>
2. using namespace std;
3. int main(){
4.
5.     /* Read input as specified in the question.
6.        * Print output as specified in the question.
7.        */
8.     int N ;
9.     cin >> N;
10.    int i =1;
11.    while(i <= N){
12.        int j =1, k=i;
13.
14.        while( j <= i){
15.            cout << k;
16.            j = j+1;
17.            k = k+1;
18.        }
19.        cout << endl;
20.
21.        i = i +1;
22.    }
23. }

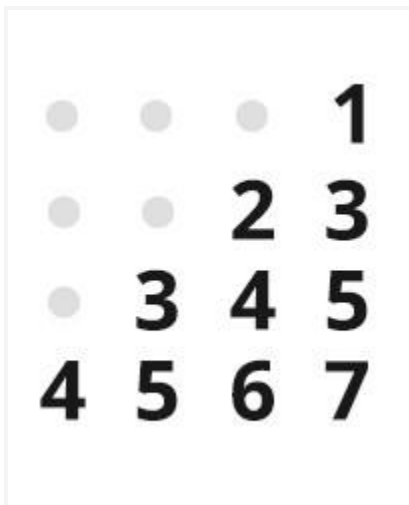
```

## 11-Tut : Number Pattern 2

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Print the following pattern

Pattern for N = 4



The dots represent spaces.



**Input Format :**

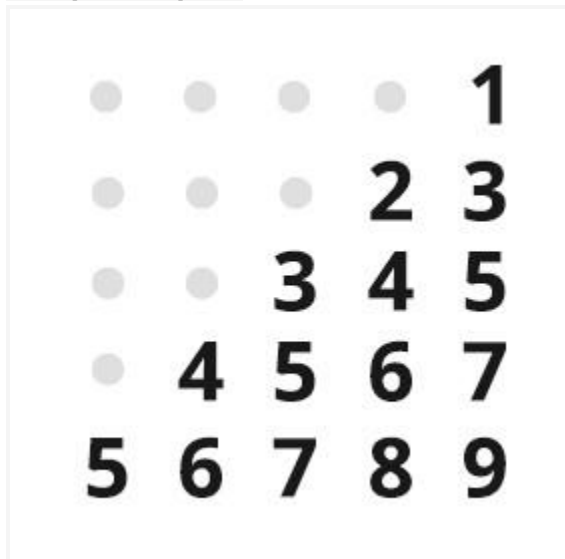
N (Total no. of rows)

**Output Format :**

Pattern in N lines

**Sample Input :** 5

**Sample Output :**



The dots represent spaces.

```
1. #include<iostream>
2. using namespace std;
3. int main(){
4.
5.     /* Read input as specified in the question.
6.        * Print output as specified in the question.
7.        */
8.     int N ;
9.     cin >> N;
10.    int i = 1;
11.    while(i <= N){
12.        int s = 1;
13.        while(s <= N-i){
14.            cout << " ";
15.            s++;
16.        }
17.        s = i;
18.        int j = 1;
19.        while(j <= i){
20.            cout << s;
21.            j++;
22.            s++;
23.        }
24.
```

```

25.     cout << endl;
26.     i++;
27. }
28. }

```

## 12-Tut : Start Pattern

[Send Feedback](#)

Print the following pattern

Pattern for N = 4

```

. . . *
. . ***
. *****
*****

```

The dots represent spaces.

**Input Format :** N (Total no. of rows)

**Output Format :** Pattern in N lines

**Constraints :** 0 <= N <= 50

**Sample Input 1 :** 3

**Sample Output 1 :**

```

*
***
*****

```

**Sample Input 2 :** 4

**Sample Output 2 :**

```

*
***
*****
*****

```

```

1. #include<iostream>
2. using namespace std;
3. int main(){
4.
5.     /* Read input as specified in the question.
6.        * Print output as specified in the question.
7.     */
8.     int N ;
9.     cin >> N;
10.    int i =1;
11.    while(i <= N){
12.
13.        int s = 1;
14.        while(s <= N-i){
15.            cout << " ";

```

```

16.     s++;
17. }
18.
19.     s =1;
20.     while(s <= 2*i -1){
21.         cout << "**";
22.         s++;
23.     }
24.     cout << endl;
25.
26.     i++;
27. }
28. }

```

### 13-Ass : Total Salary

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Write a program to calculate the total salary of a person. The user has to enter the basic salary (an integer) and the grade (an uppercase character), and depending upon which the total salary is calculated as -

$\text{totalSalary} = \text{basic} + \text{hra} + \text{da} + \text{allow} - \text{pf}$

**where :**

hra = 20% of basic

da = 50% of basic

allow = 1700 if grade = 'A'

allow = 1500 if grade = 'B'

allow = 1300 if grade = 'C' or any other character

pf = 11% of basic.

**Round off the total salary and then print the integral part only.**

**Note: Try finding out a function on the internet to do so**

**Input format :**

Basic salary & Grade (separated by space)

**Output Format :**

Total Salary

**Constraints :**

$0 \leq \text{Basic Salary} \leq 7,500,000$

**Sample Input 1 :**

10000 A

**Sample Output 1 :**

17600

**Sample Input 2 :**

4567 B

**Sample Output 2 :**

8762

**Explanation of Input 2:**

We have been given the basic salary as Rs. 4567. We need to calculate the hra, da and pf.

Now when we calculate each of the, it turns out to be:

hra = 20% of Rs. 4567 = Rs. 913.4

da = 50% of Rs. 4567 = Rs. 2283.5

pf = 11% of Rs. 4567 = Rs. 502.37

Since, the grade is 'B', we take allowance as Rs. 1500.

On substituting these values to the formula of totalSalary, we get Rs. 8761.53 and now rounding it off will result in Rs. 8762 and hence the Answer.

```
1. #include<iostream>
2. using namespace std;
3.
4. int main() {
5.     // Write your code here
6.     unsigned long int basic;
7.     char grade;
8.     cin >> basic >> grade ;
9.
10.    double hra,da,pf;
11.    hra = 0.2 * basic;
12.    da = 0.5 * basic;
13.    pf = 0.11 *basic;
14.
15.    float allow;
16.    if(grade == 'A'){
17.        allow = 1700;
18.    }
19.    else if(grade == 'B'){
20.        allow = 1500;
21.    }else {
22.        allow = 1300;
23.    }
24.    double totalsalary = basic + hra + da + allow - pf;
25.    unsigned long int totalsalary1 = totalsalary;
26.    // double totalsalary2 = totalsalary1 + 0.5;
27.    if( totalsalary >= totalsalary1 +0.5){
28.        totalsalary1 = totalsalary1+1;
29.    }
30.    cout << totalsalary1;
31. }
```

#### 14-Ass : Sum of even & odd

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Write a program to input an integer N and print the sum of all its even digits and sum of all its odd digits separately.

**Digits mean numbers, not the places! That is, if the given integer is "13245", even digits are 2 & 4 and odd digits are 1, 3 & 5.**

**Input format :**

Integer N

**Output format :**

Sum\_of\_Even\_Digits Sum\_of\_Odd\_Digits

(Print first even sum and then odd sum separated by space)

**Constraints**  $0 \leq N \leq 10^8$

**Sample Input 1:** 1234

**Sample Output 1:** 6 4

**Sample Input 2:** 552245

**Sample Output 2:** 8 15

**Explanation for Input 2:**

For the given input, the even digits are 2, 2 and 4 and if we take the sum of these digits it will come out to be  $8(2 + 2 + 4)$  and similarly, if we look at the odd digits, they are, 5, 5 and 5 which makes a sum of  $15(5 + 5 + 5)$ . Hence the answer would be,  $8(\text{evenSum})$  <single space>  $15(\text{oddSum})$

```
1. #include<iostream>
2. using namespace std;
3.
4. int main() {
5.     // Write your code here
6.     int N;
7.     cin >> N;
8.     short int even_sum = 0, odd_sum = 0;
9.
10.    int n = N;
11.
12.    while(n != 0)
13.    {
14.        int r = n % 10;
15.        if(r % 2 == 0)
16.        {
17.            even_sum = even_sum + r;
18.        }else
19.        {
20.            odd_sum = odd_sum + r;
21.        }
22.        n = n/10;
23.    }
24.
25.    cout << even_sum << " " << odd_sum;
26. }
27.
```

### 15-Ass : Find power of a number

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Write a program to find x to the power n (i.e.  $x^n$ ). Take x and n from the user. You need to print the answer.

**Note :** For this question, you can assume that 0 raised to the power of 0 is 1

#### Input format :

Two integers x and n (separated by space)

#### Output Format :

$x^n$  (i.e. x raise to the power n)

#### Constraints:

$0 \leq x \leq 8$

$0 \leq n \leq 9$

#### Sample Input 1 :

3 4

#### Sample Output 1 :

81

#### Sample Input 2 :

2 5

#### Sample Output 2 :

32

```
1. #include<iostream>
2. using namespace std;
3.
4. int main() {
5.     // Write your code here
6.     int x,n;
7.     cin >> x >> n;
8.     if(x == 0 && n == 0){
9.         cout << 1;
10.    }
11.    else{
12.        int i = 1,val =1;
13.        while(i <= n){
14.            val = val *x;
15.            i ++;
16.        }
17.
18.        cout << val;
19.    }
20. }
```