

Institute of Computer Technology
B. Tech. Computer Science and Engineering

Sub: ESFP – I
Course Code: 2CSE102

Practical – 4

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Q.1.Problem Definition:

Make a program in C to accept any random two numbers from user.

Find out

bitwise (|) addition and (&) multiplication of two numbers.

Case-1:

[Hint: Bitwise addition: Assume a = 5, b=6

- 5 in binary bit : 00000101

- 6 in binary bit : 00000110

- Binary Addition (5 | 6) : 00000111

- Result : 7

]

Case-2:

- [Hint : Bitwise multiplication: Assume a = 5, b=6

- 5 in binary bit : 00000101

- 6 in binary bit : 00000110

- Binary multiplication (5 & 6) : 00000100

- Result : 4]

Input Format:

- Input two numbers in the first line followed by one space.

- For example.

- 5 6

Output Format:

- Two number binary addition output should be in first line.

- For example.

- 7

- Two number binary multiplication output should be second line.

- 4

Sample Input:

5 6

Sample Output:

7

4

Solution:

Code:-

//Practical 4,(Q.1) Problem,

```
#include <stdio.h>
```

```
void main()
```

```
{
```

```
    int a;
```

```
    int b;
```

```
    printf("Enter the value of a and b: \n");
```

```
    scanf("%d%d",&a,&b);
```

```
    int c = ~a;
```

```
    printf("\n");
```

```
    printf("The value of ~a is: %d\n\n",c);
```

```
    int z=a|b;
```

```

printf("the value of Binary Addition is:%d\n\n",z);

int y=a&b;
printf("THE value of Binary multiplication is: %d",y);

}

```

```

main.c
1 //Practical 4,(Q.1) Problem,
2
3 #include <stdio.h>
4
5 int main()
6 {
7     int a,b;
8     printf("Enter the value of a and b:\n");
9     scanf("%d %d",&a,&b);
10    printf("The value of ~a is: %d\n",~a);
11    printf("the value of Binary Addition is:%d\n\n",a+b);
12    printf("THE value of Binary multiplication is: %d\n",a&b);
13    return 0;
14 }

```

input

```

Enter the value of a and b:
5 6

The value of ~a is: -6

the value of Binary Addition is:7

THE value of Binary multiplication is: 4

...Program finished with exit code 0
Press ENTER to exit console.

```

Q.2. Problem Definition : Write program and find out the result with the help of given first and second operand value using left-shift and right-shift bitwise operators. Explain solution with the help of binary numbers as well as with the help of formulas. Assume, x and y value are pre-initialized in program, or if you want to read x and y value at run time, you can read it, but you have to read same value which I have mentioned in the table. Following is the value of first and second operand.

Solution:

Code:-

```
#include <stdio.h>
```

```
void main()
```

```
{
```

```
    int x;
```

```
    int y;
```

```
    int Option;
```

```
    printf("Enter: 1:For left-shift\n""Enter:2:For right-shift\n");
```

```
    scanf("%d",&Option);
```

```
    if(Option==1)
```

```
    {
```

```
        printf("Enter the value of x and y for left-shift: \n");
```

```
        scanf("%d%d",&x,&y);
```

```
        printf("The value of left-shift is:%d ",x<<y);
```

```
    }
```

```
    else if(Option==2)
```

```
    {
```

```
        printf("Enter the value of x and y for right-shift: \n");
```

```
        scanf("%d%d",&x,&y);
```

```
        printf("The value of left-shift is:%d ",x>>y);
```

```
    }
```

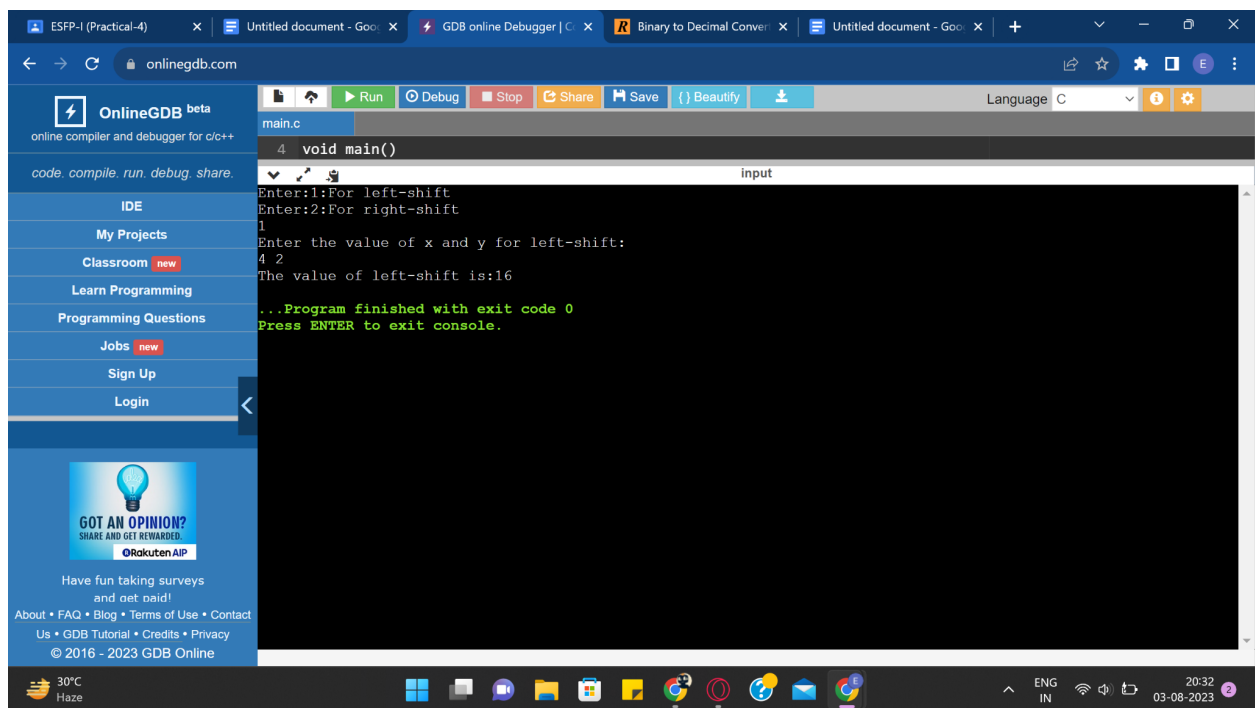
```
}
```

1. $x=4$

$y=2$

Find:

$x \ll y$



The screenshot shows the OnlineGDB web interface. The browser tabs include 'ESFP-I (Practical-4)', 'Untitled document - Google', 'GDB online Debugger | C', 'Binary to Decimal Converter', and 'Untitled document - Google'. The OnlineGDB interface has a sidebar with links like 'My Projects', 'Classroom', 'Learn Programming', 'Programming Questions', 'Jobs', 'Sign Up', and 'Login'. The main area displays a C program in 'main.c' with the following code:

```
4 void main()
{
    Enter:1:For left-shift
    Enter:2:For right-shift
    1
    Enter the value of x and y for left-shift:
    4 2
    The value of left-shift is:16
    ...Program finished with exit code 0
    Press ENTER to exit console.
}
```

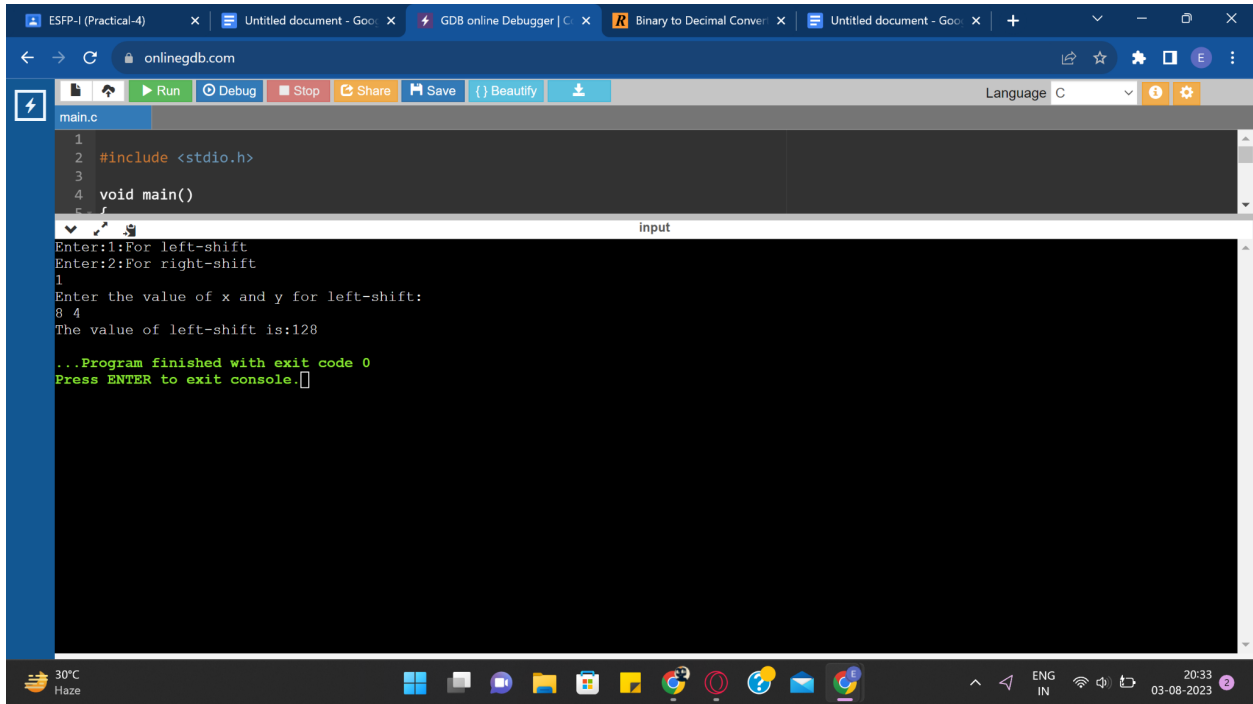
The output of the program is visible in the console area, showing the input values and the result of the left-shift operation. The bottom of the screen shows a Windows taskbar with the date and time '03-08-2023 20:32'.

2. $x=8$

$y=4$

Find:

$x \ll y$

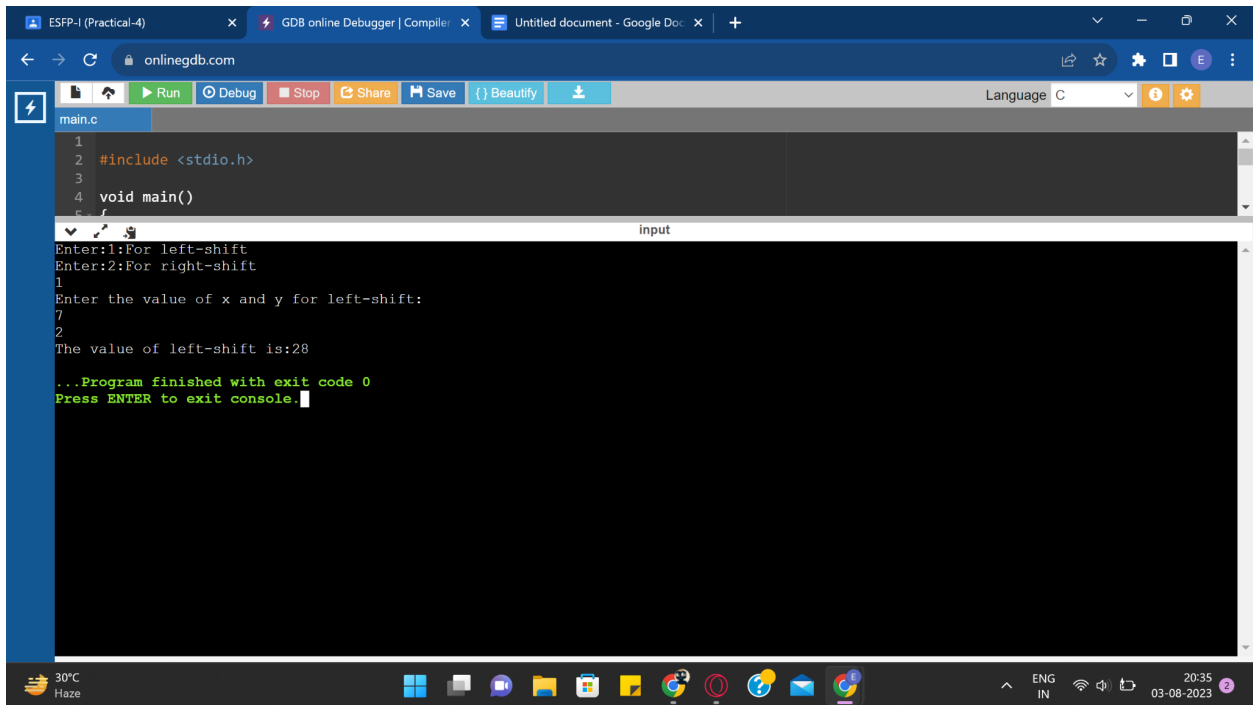


```
main.c
1
2 #include <stdio.h>
3
4 void main()
5
Enter:1:For left-shift
Enter:2:For right-shift
1
Enter the value of x and y for left-shift:
8 4
The value of left-shift is:128
...Program finished with exit code 0
Press ENTER to exit console.
```

3. $x=7$

Find:

$x \ll 2$



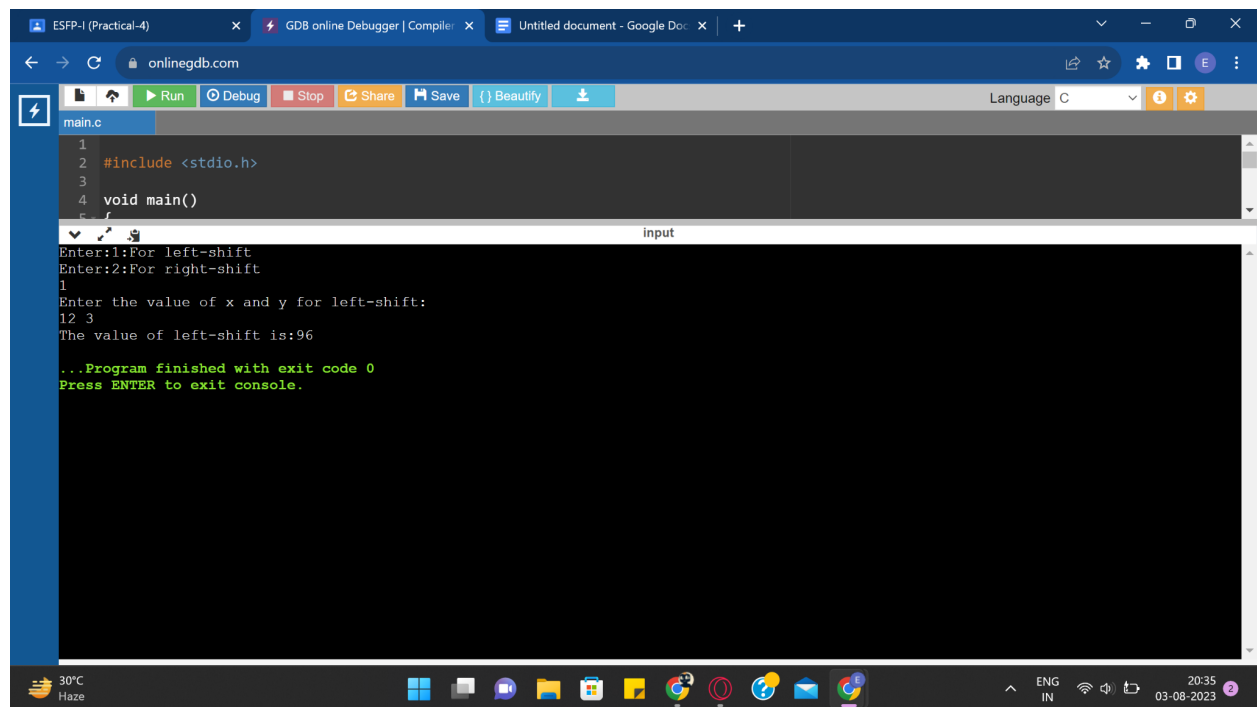
```
main.c
1
2 #include <stdio.h>
3
4 void main()
5
Enter:1:For left-shift
Enter:2:For right-shift
1
Enter the value of x and y for left-shift:
7 2
The value of left-shift is:28
...Program finished with exit code 0
Press ENTER to exit console.
```

4. $x=12$

$y=3$

Find:

$x \ll y$



The screenshot shows a web browser window with the URL `onlinegdb.com`. The browser has several tabs open: "ESFP-I (Practical-4)", "GDB online Debugger | Compile", and "Untitled document - Google Doc". The GDB online Debugger interface is active, displaying a C program in a file named `main.c`. The code is as follows:

```
1
2 #include <stdio.h>
3
4 void main()
5 {
6     //
7 }
```

Below the code editor, the "input" window shows the program's execution. It prompts the user to enter values for `x` and `y` for a left-shift operation. The user has entered `12` for `x` and `3` for `y`. The program output is:

```
Enter:1:For left-shift
Enter:2:For right-shift
1
Enter the value of x and y for left-shift:
12 3
The value of left-shift is:96
...Program finished with exit code 0
Press ENTER to exit console.
```

The Windows taskbar at the bottom of the screen shows the system clock as 20:35 on 03-08-2023, with a temperature of 30°C and a "Haze" weather condition.

5. $x=2$

$y=1$

Find:

$x \gg y$

```
main.c
1
2 #include <stdio.h>
3
4 void main()
5 {
6     int left_shift, right_shift;
7     printf("Enter:1:For left-shift\n");
8     scanf("%d", &left_shift);
9     printf("Enter:2:For right-shift\n");
10    scanf("%d", &right_shift);
11    printf("Enter the value of x and y for right-shift:\n");
12    scanf("%d %d", &x, &y);
13    printf("The value of left-shift is:%d\n", left_shift);
14    ...Program finished with exit code 0
15    Press ENTER to exit console.
```

6. $x=12$

$Y=3$

Find:

$x \gg y$

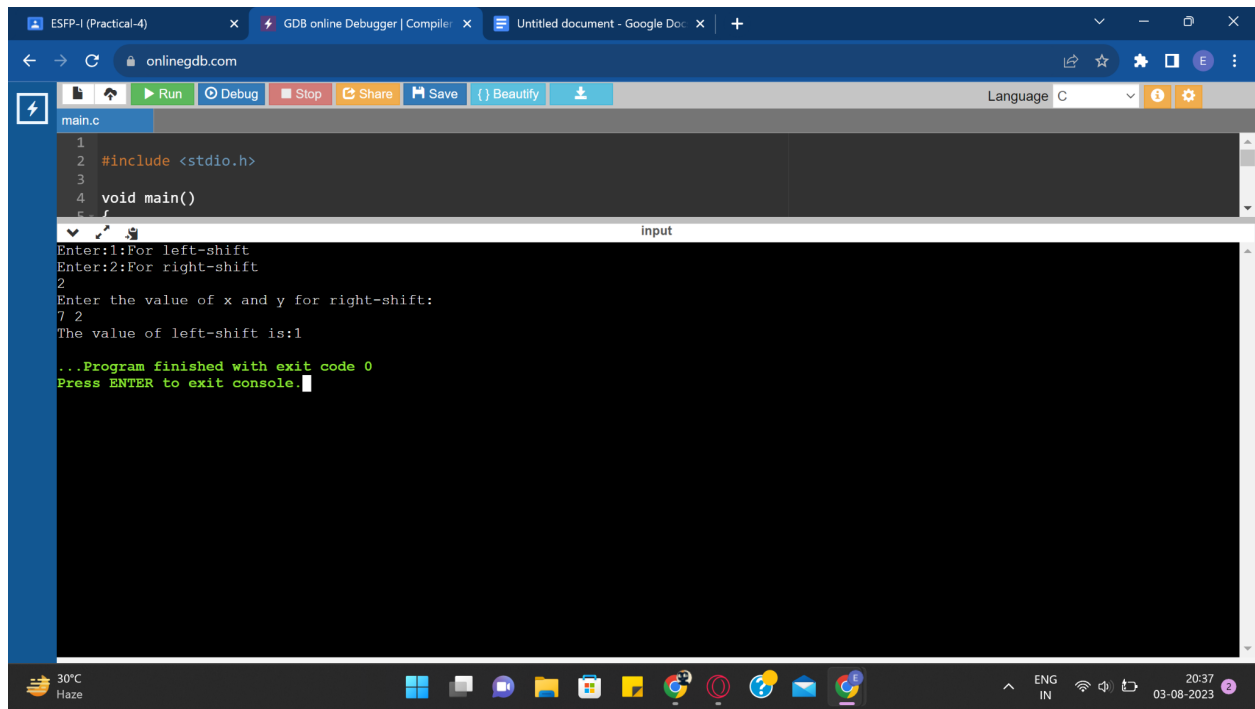
```
main.c
1
2 #include <stdio.h>
3
4 void main()
5 {
6     int left_shift, right_shift;
7     printf("Enter:1:For left-shift\n");
8     scanf("%d", &left_shift);
9     printf("Enter:2:For right-shift\n");
10    scanf("%d", &right_shift);
11    printf("Enter the value of x and y for right-shift:\n");
12    scanf("%d %d", &x, &y);
13    printf("The value of left-shift is:%d\n", left_shift);
14    ...Program finished with exit code 0
15    Press ENTER to exit console.
```

7. $x=7$

Y=2

Find:

$x \gg y$



The screenshot shows a web browser window with the URL `onlinegdb.com`. The browser has three tabs: "ESFP-I (Practical-4)", "GDB online Debugger | Compile", and "Untitled document - Google Doc...". The GDB online Debugger interface includes a toolbar with buttons for Run, Debug, Stop, Share, Save, and Beautify. The language is set to C. The code editor shows a file named `main.c` with the following content:

```
1
2 #include <stdio.h>
3
4 void main()
```

The output window, titled "input", displays the following text:

```
Enter:1:For left-shift
Enter:2:For right-shift
2
Enter the value of x and y for right-shift:
7 2
The value of left-shift is:1
...Program finished with exit code 0
Press ENTER to exit console.
```

The Windows taskbar at the bottom shows the system clock as 20:37 on 03-08-2023, with a temperature of 30°C and weather condition of Haze.

8. $x=12$

Find:

$x \gg 3$

The screenshot shows a web browser window with the URL `onlinegdb.com`. The browser tabs include "ESFP-I (Practical-4)", "GDB online Debugger | Compile", and "Untitled document - Google Doc". The interface features a toolbar with buttons for Run, Debug, Stop, Share, Save, and Beautify. The main area is divided into two panes. The top pane, titled "main.c", contains the following C code:

```
1
2 #include <stdio.h>
3
4 void main()
5
```

The bottom pane, titled "Input", displays the program's execution output:

```
Enter:1:For left-shift
Enter:2:For right-shift
2
Enter the value of x and y for right-shift:
12 3
The value of left-shift is:1
...Program finished with exit code 0
Press ENTER to exit console.
```

The Windows taskbar at the bottom shows the system clock as 20:38 on 03-08-2023, along with weather information (30°C, Haze) and various application icons.

Q.3. Find out the result of the following with the help of increment and decrement operator, if you have any error, correct it, and then write a proper code with output.

Solution:

Code:-

```
1.
#include<stdio.h>
#include<math.h>
int main()
{
    int a=2,b;
    b=a++ + a-- + ++a + --a;
    printf("%d %d",a,b);

    return 0;
}
```

```
main.c
1 //Practical-3(Q-3);
2 #include<stdio.h>
3 #include<math.h>
4 int main()
5 {
6     int a=2,b;
7     b=a++ + a-- + ++a + --a;
8     printf("The value of the a and b is given as respectively:\n");
9     printf("%d %d",a,b);
10    //for int 'return 0;' was not written.
11    return 0;
12 }
13
```

input

The value of the a and b is given as respectively:
2 10

...Program finished with exit code 0
Press ENTER to exit console.

2.

```
#include<stdio.h>
#include<math.h>
int main()
{
int a = 5, b = 7;
int c = --a + b--;
printf("%d",c);
}
```

```

1      //Practical-3(Q-3);
2      #include<stdio.h>
3      #include<math.h>
4      int main()
5      {
6          int a = 5, b = 7;
7          int c = --a+b--;
8          printf("%d",c);
9          //for int 'return 0;' was not written.
10         return 0;
11     }

```

11

...Program finished with exit code 0
 Press ENTER to exit console.

3.

```

#include<stdio.h>
#include<math.h>
int main()
{
int a = 4, b = 9;
int c = (a + b++) + (--a + b--);
printf("%d",c);

```

}

```
1 //Practical-3(Q-3);
2 //3.
3 #include<stdio.h>
4 #include<math.h>
5 int main()
6 {
7     int a = 4, b = 9;
8     int c = (a + b++) + (--a + b--);
9     printf("%d",c);
10    //for int 'return 0;' was not written.
11    return 0;
12 }
13
```



26

...Program finished with exit code 0
Press ENTER to exit console.

4.

```
#include<stdio.h>
#include<math.h>
int main()
{
```

```
bool a = false;
a++;
printf("%d",a);
}
```

```
1 //Practical-3(Q-3);
2 //4.
3 #include<stdio.h>
4 #include<math.h>
5 //'#include<stdbool.h>' was not written.
6 #include<stdbool.h>
7 int main()
8 {
9     bool a = false;
10    a++;
11    printf("%d",a);
12    //for int 'return 0;' was not written.
13    return 0;
14 }
15
16
```



1

```
...Program finished with exit code 0
Press ENTER to exit console. □
```

5.

```
#include<stdio.h>
#include<math.h>
int main()
{
```

```
int a = 5;
int c = ++(++a);
return 0;
}
```

```
1 //Practical-3(Q-3);
2 //5.
3 #include<stdio.h>
4 #include<math.h>
5 int main()
6 {
7     int a = 5;
8     //to add '++' two times you need to and it step by step.
9     int c =(++a,++a);
10    //there was no printf used to display the ending value.
11    printf("The value of c is: %d",c);
12    return 0;
13 }
14
15
16
```

input

The value of c is: 7

...Program finished with exit code 0
Press ENTER to exit console.

6.

```
#include<stdio.h>
int main()
{
int a=5;
printf("%d", ++a++);
return 0;
}
```

```
1 //Practical-3(Q-3);
2 //6.
3 #include<stdio.h>
4 int main()
5 {
6 int a=5;
7 //to add '++' two times you need to and it step by step.
8 //and use '%d' two times.
9 printf("%d %d", ++a,a++);
10 return 0;
11 }
12
13
14
15
16
```

input

```
7 5

...Program finished with exit code 0
Press ENTER to exit console.
```

Q.4: Implement the code to find the result of various expressions, if you found any error, correct it, and then print output.

1.


```
1 //Practical-4(Q-4);
2 //1.
3 #include<stdio.h>
4 int main()
5 {
6 int a=5,b=6,c=9;
7 c=a+b%c*b/a;
8 //double inverted coma was wrong.
9 printf("%d",a);
10 // 'return 0;' was not written.
11 return 0;
12 }
13
14
15
16
```



5

...Program finished with exit code 0
Press ENTER to exit console.

2.

```
1 //Practical-4(Q-4);
2 //1.
3 //#include<stdio.h> was not written.
4 #include<stdio.h>
5 int main()
6 {
7 int a=5, b=6; b=++a
8 * ++a * ++a ;
9 printf("%d", b);
10 // 'return 0;' was not written.
11 return 0;
12
13 }
14
15
16
```



392

...Program finished with exit code 0
Press ENTER to exit console.

3.

```

1      //Practical-4(Q-4);
2      //1.
3      //#include<stdio.h> was not written.
4      #include<stdio.h>
5      int main()
6      {
7      int a=5,b=6,c=9;
8      c=a<<2; //or c=a>>2;|
9      printf("%d",c);
10     // 'return 0;' was not written.
11     return 0;
12     }
13
14
15
16

```



20

...Program finished with exit code 0
 Press ENTER to exit console.

4.

```

1      //Practical-4(Q-4);
2      //4.
3      //#include<stdio.h> was not written.
4      #include<stdio.h>
5      int main()
6      {
7      int a=5,b=6,c=9;
8      c=a&b+c|b/a&c;
9      printf("%d",c);
10     // 'return 0;' was not written.
11     return 0;
12 }
13
14
15
16

```

5

...Program finished with exit code 0
Press ENTER to exit console.

5.

```
1 //Practical-4(Q-4);
2 //5.
3 //#include<stdio.h> was not written.
4 #include<stdio.h>
5 int main()
6 {
7 int a=5,b=6,c=9;
8 c=a+b<<2+c&b;
9 printf("%d",c);
10 // 'return 0;' was not written.
11 return 0;
12 }
13
14
15
16
```



0

...Program finished with exit code 0
Press ENTER to exit console. █

6.

```

1      //Practical-4(Q-4);
2      //5.
3      //#include<stdio.h> was not written.
4      #include<stdio.h>
5      int main()
6      {
7      int a=5,b=6,c=9;
8      c=++a + a++ + ++a;
9      printf("%d",c);
10     printf("\n");
11     c=++c+b<<4+b&a;
12     printf("%d",a);
13     // 'return 0;' was not written.
14     return 0;
15 }
16

```

21
8

...Program finished with exit code 0
Press ENTER to exit console.

7.

```

1 //Practical-4(Q-4);
2 //7.
3 //#include<stdio.h> was not written.
4 #include<stdio.h>
5 int main()
6 {
7 int a=5,b=6,c=9; c+=b;
8 printf("%d",c);
9 printf("\n");
10 c=a^b<<2+b^a;
11 printf("%d",c);
12 //'return 0;' was not written.
13 return 0;
14 }
15
16

```



```

15
1536

```

```

...Program finished with exit code 0
Press ENTER to exit console.

```

8.

```
1 //Practical-4(Q-4);
2 //7.
3 // #include<stdio.h> was not written.
4 #include<stdio.h>
5 int main()
6 {
7     int a=5,b=6,c=9;
8     c=a^c<<2+b&c;
9     printf("%d",a);
10 // 'return 0;' was not written.
11     return 0;
12 }
13
14
15
16
```



5

...Program finished with exit code 0
Press ENTER to exit console.

9.


```

1      //Practical-4(Q-4);
2      //7.
3      //#include<stdio.h> was not written.
4      #include<stdio.h>
5      int main()
6      {
7      int a=5,b=6,c=9;
8      c=a>=b+c&b^a<<2+a&&b;
9      printf("%d",c);
10     // 'return 0;' was not written.
11     return 0;
12 }
13
14
15
16

```



1

```

...Program finished with exit code 0
Press ENTER to exit console.

```

10.

```
1 //Practical-4(Q-4);
2
3 // #include<stdio.h> was not written.
4 #include<stdio.h>
5 int main()
6 {
7     int a = 5; a = 1,a=2,a=3;
8     printf("%d", a);
9     return 0;
10 }
11
12
13
14
15
16
```



3

```
...Program finished with exit code 0
Press ENTER to exit console.
Press ENTER to exit console.
```

11.

```
1 //Practical-4(Q-4);
2
3 //#include<stdio.h> was not written.
4 #include<stdio.h>
5 int main()
6 {
7 int x[10] = {0, 1, 2, 3,
8 4, 5, 6, 7, 8, 9};
9 //it needs the size of the variable.
10 printf("%li", sizeof(x));
11 return 0;
12 }
13
14
15
16
```

40

...Program finished with exit code 0
Press ENTER to exit console.

12.

```
1 //Practical-4(Q-4);
2
3 // #include<stdio.h> was not written.
4 #include<stdio.h>
5 int main()
6 {
7     unsigned int num = -4;
8     printf("%d", ~num);
9     return 0;
10 }
11
12
13
14
15
16
```



3

```
...Program finished with exit code 0
Press ENTER to exit console.
```

13.

```

1      //Practical-4(Q-4);
2
3      //#include<stdio.h> was not written.
4      #include<stdio.h>
5      int main()
6      {
7      int x = 2;
8      (x & 1) ?
9      printf("true") :
10     printf("false");
11     return 0;
12 }
13
14
15
16

```



false

...Program finished with exit code 0
Press ENTER to exit console.

14.

```
1 //Practical-4(Q-4);
2
3 // #include<stdio.h> was not written.
4 #include<stdio.h>
5 int main()
6 {
7     int a = 4, b = 2;
8     printf("a^b = %d", a^b);
9     return 0;
10 }
11
12
13
14
15
16
```



a^b = 6

...Program finished with exit code 0
Press ENTER to exit console.

15.

```
1 //Practical-4(Q-4);
2
3 //#include<stdio.h> was not written.
4 #include<stdio.h>
5 int main()
6 {
7     int a = 4, b = 2;
8     printf("~a= %d\n",~a);
9     printf("~b= %d",~b);
10    return 0;
11 }
12
13
14
15
16
```



```
~a= -5
~b= -3
```

```
...Program finished with exit code 0
Press ENTER to exit console.
```

