

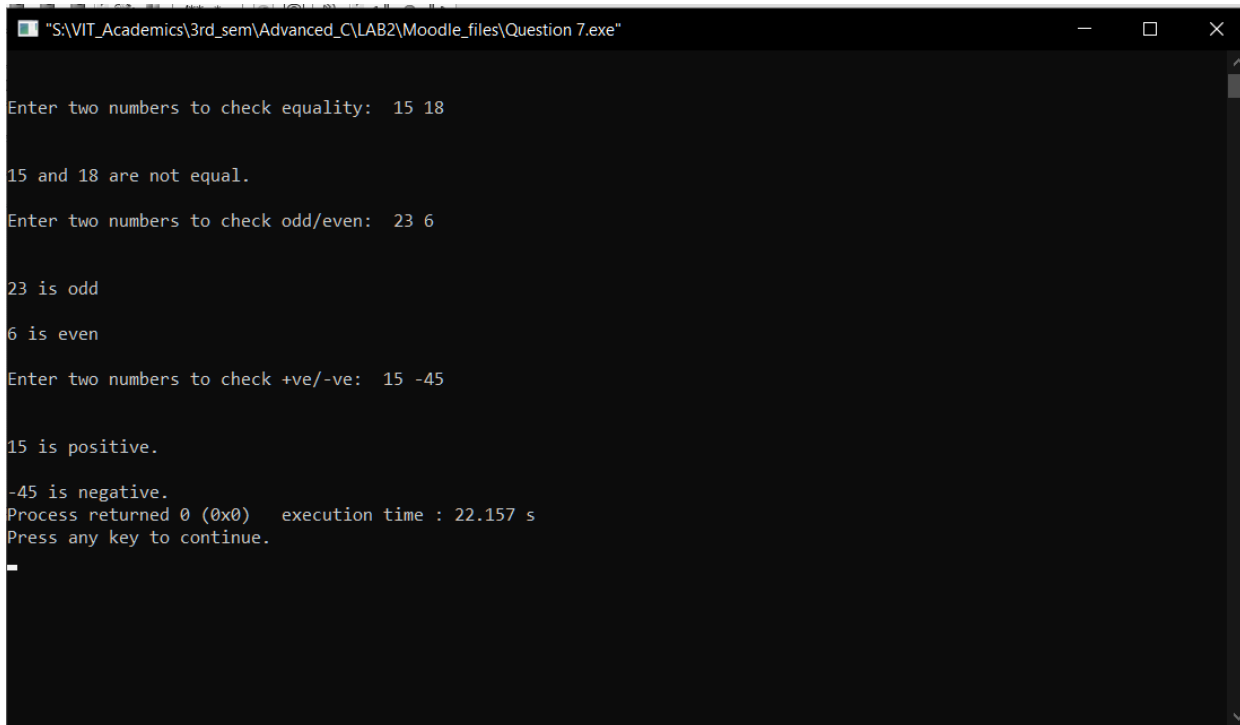
Question 7:

Use only bitwise operators and control statements for the following:

- a. Check whether two numbers are equal*
- b. Check whether a number is odd or even*
- c. Check whether a number is positive or negative (note: the first bit is zero if it is positive)*

Codes:

```
1 // Use only bitwise operators and control statements for the following:
2
3 // a. Check whether two numbers are equal
4
5 // b. Check whether a number is odd or even
6
7 // c. Check whether a number is positive or negative (note: the first bit is zero if it is positive)
8
9 #include<stdio.h>
10 void isequal(int x, int y) ;
11 void iseven(int x);
12 void ispositive(int x);
13 int main()
14 {
15     int a, b;
16
17     printf("\n\nEnter two numbers to check equality: ");
18     scanf("%d %d", &a, &b);
19     isequal(a, b);
20
21     printf("\n\nEnter two numbers to check odd/even: ");
22     scanf("%d %d", &a, &b);
23     iseven(a);
24     iseven(b);
25
26     printf("\n\nEnter two numbers to check +ve/-ve: ");
27     scanf("%d %d", &a, &b);
28     ispositive(a);
29     ispositive(b);
30
31     return 0;
32 }
33
34
35 //function to check by bit manipulation if two numbers are equal by comparing two numbers bit by bit.
36 //if any corresponding bit are unequal, the numbers are unequal. Else equal
37 //bitwise XOR. If all bits are not same, they're not equal. Else equal
38 void isequal(int x, int y)
39 {
40     if(x ^ y)
41     {
42         printf("\n\n%d and %d are not equal.", x, y);
43     }
44     else
45     {
46         printf("\n\n%d and %d are equal.", x, y);
47     }
48     return;
49 }
50
51 //function to check and display if a number is even or odd by bit manipulation.
52 //if last bit is 1, its odd. Else its even.
53 void iseven(int x)
54 {
55     if(x&1)
56     {
57         printf("\n\n%d is odd", x);
58         return;
59     }
60     printf("\n\n%d is even", x);
61     return;
62 }
63
64 //function to check and display if a number is positive or negative.
65 //If the first bit is 1, its negative. Else its positive.
66 void ispositive(int x)
67 {
68     if(x & (1 << 31))
69     {
70         printf("\n\n%d is negative.", x);
71         return;
72     }
73     printf("\n\n%d is positive.", x);
74     return;
75 }
```

Test case 1:

```
"S:\VIT_Academics\3rd_sem\Advanced_C\LAB2\Moodle_files\Question 7.exe"

Enter two numbers to check equality: 15 18

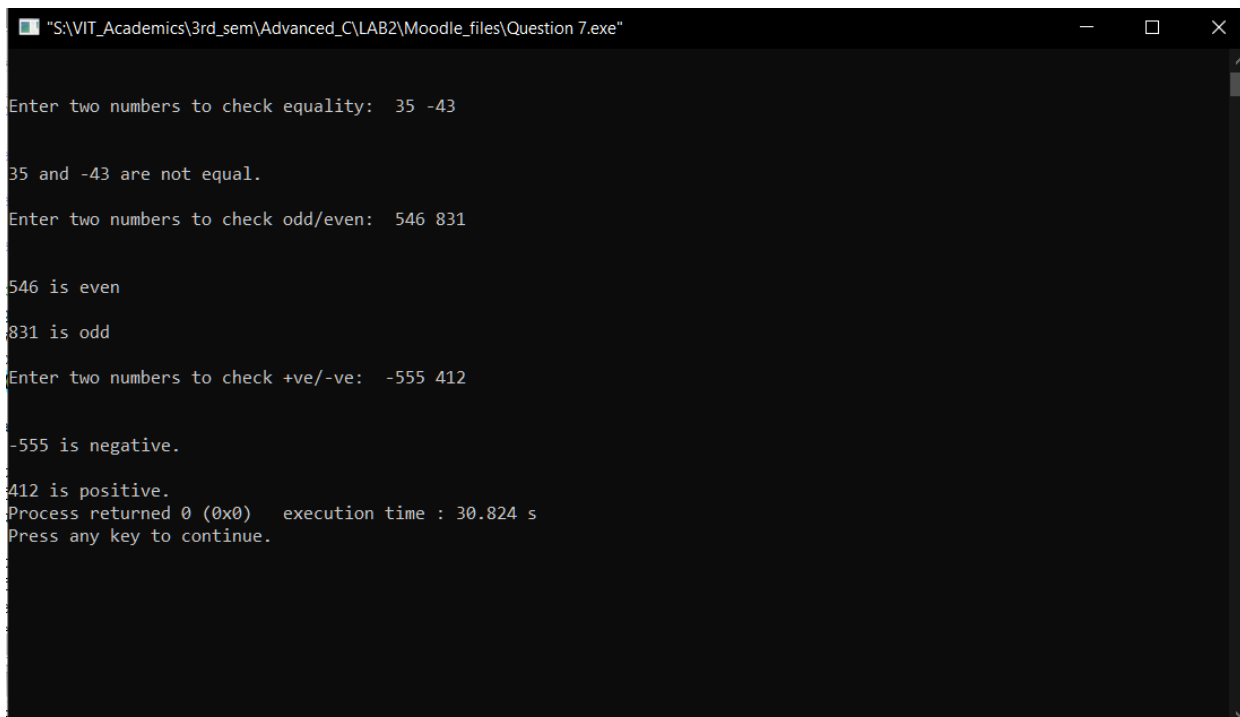
15 and 18 are not equal.

Enter two numbers to check odd/even: 23 6

23 is odd
6 is even

Enter two numbers to check +ve/-ve: 15 -45

15 is positive.
-45 is negative.
Process returned 0 (0x0)   execution time : 22.157 s
Press any key to continue.
_
```

Test case 2:

```
"S:\VIT_Academics\3rd_sem\Advanced_C\LAB2\Moodle_files\Question 7.exe"

Enter two numbers to check equality: 35 -43

35 and -43 are not equal.

Enter two numbers to check odd/even: 546 831

546 is even
831 is odd

Enter two numbers to check +ve/-ve: -555 412

-555 is negative.
412 is positive.
Process returned 0 (0x0)   execution time : 30.824 s
Press any key to continue.
```

Question 8:

*Write a program to convert and display a decimal number in number with base 26, with its digit being represented as alphabets from a – z (0-25). Maximum size of input is $26*26 - 1$.*

Eg.

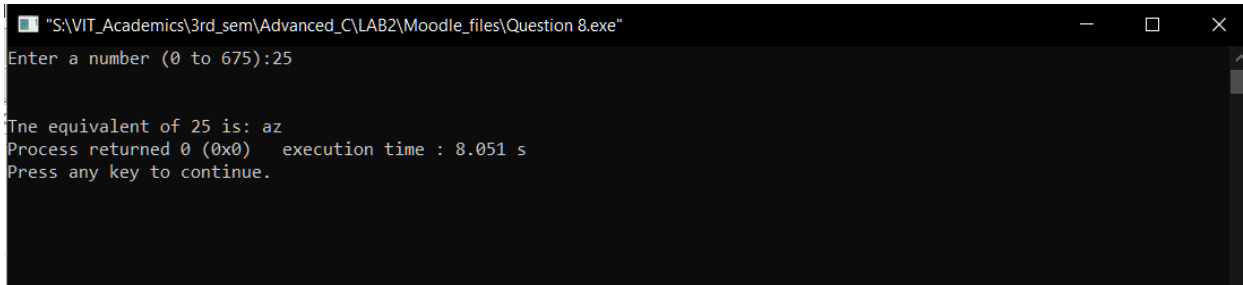
Inp = 25, out= az;

inp = 26, out = ba;

inp=52, out=ca.

Codes:

```
1  #include<stdio.h>
2
3  int main()
4  {
5      int x, first_dig, second_dig;
6      printf("Enter a number (0 to 675):");
7      scanf("%d", &x);
8      printf("\n\nThe equivalent of %d is: ", x);
9      |
10     second_dig = x % 26;
11     second_dig = second_dig + 'a';
12
13     x = x / 26;
14
15     first_dig = x ;
16     first_dig = first_dig + 'a';
17
18     printf("%c%c", first_dig, second_dig);
19
20     return 0;
21 }
```

Test cases:

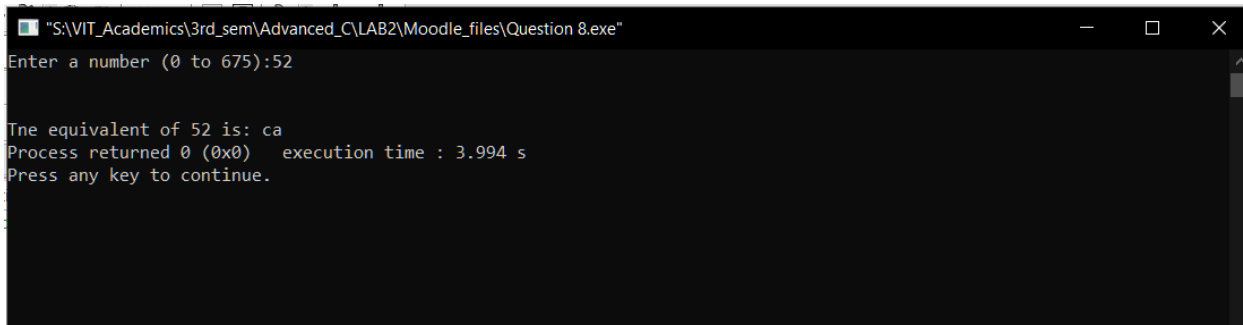
```
"S:\VIT_Academics\3rd_sem\Advanced_C\LAB2\Moodle_files\Question 8.exe"
Enter a number (0 to 675):25

The equivalent of 25 is: az
Process returned 0 (0x0) execution time : 8.051 s
Press any key to continue.
```



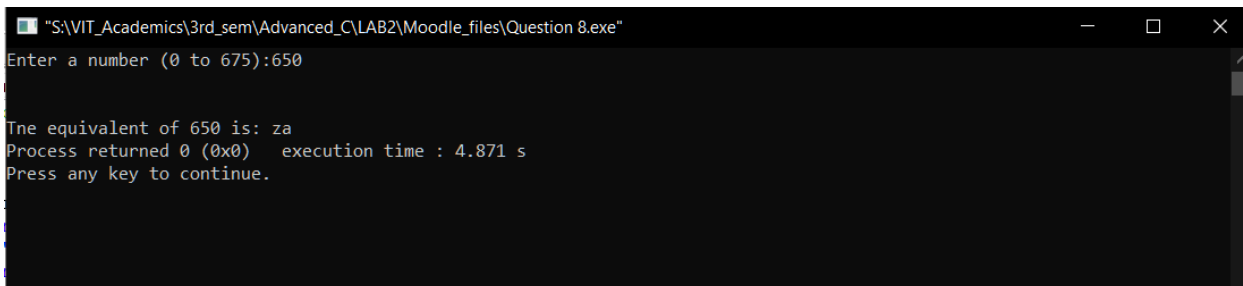
```
"S:\VIT_Academics\3rd_sem\Advanced_C\LAB2\Moodle_files\Question 8.exe"
Enter a number (0 to 675):26

The equivalent of 26 is: ba
Process returned 0 (0x0) execution time : 4.986 s
Press any key to continue.
```



```
"S:\VIT_Academics\3rd_sem\Advanced_C\LAB2\Moodle_files\Question 8.exe"
Enter a number (0 to 675):52

The equivalent of 52 is: ca
Process returned 0 (0x0) execution time : 3.994 s
Press any key to continue.
```



```
"S:\VIT_Academics\3rd_sem\Advanced_C\LAB2\Moodle_files\Question 8.exe"
Enter a number (0 to 675):650

The equivalent of 650 is: za
Process returned 0 (0x0) execution time : 4.871 s
Press any key to continue.
```

