



Chandpur Science and Technology University

Department of Computer Science and Engineering

LAB ASSIGNMENT #2



C Lab Assignment Submitted By:

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Problem No – 1

Title:

Print the value of y for given x=2 & z=4 and analyse the output.

- a. $y = x++ + ++x$; b. $y = ++x + ++x$; c. $y = ++x + ++x + ++x$;
d. $y = x > z$; e. $y = x > z ? x : z$; f. $y = x \& z$;
g. $y = x >> 2 + z << 1$;

Output:

The screenshot shows a C++ code editor with the following code:

```
1 #include <stdio.h>
2
3 int main()
4 {
5     int x=3,z=4,y;
6     y = x++ ++x;
7     printf("The value for option a is %d\n",y);
8
9
10    x=3,z=4,y;
11    y = ++x ++x;
12    printf("The value for option b is %d\n",y);
13
14
15    x=3,z=4,y;
16    y = ++x ++x ++x;
17    printf("The value for option c is %d\n",y);
18
19
20
21    x=3,z=4,y;
22    y = x > z;
23    printf("The value for option d is %d\n",y);
24
25
26    x=3,z=4,y;
27    y = x > z ? x : z;
28    printf("The value for option e is %d\n",y);
29
30
31
32    x=3,z=4,y;
33    y = x & z;
34    printf("The value for option f is %d\n",y);
35
```

The output of the program is displayed in a separate window:

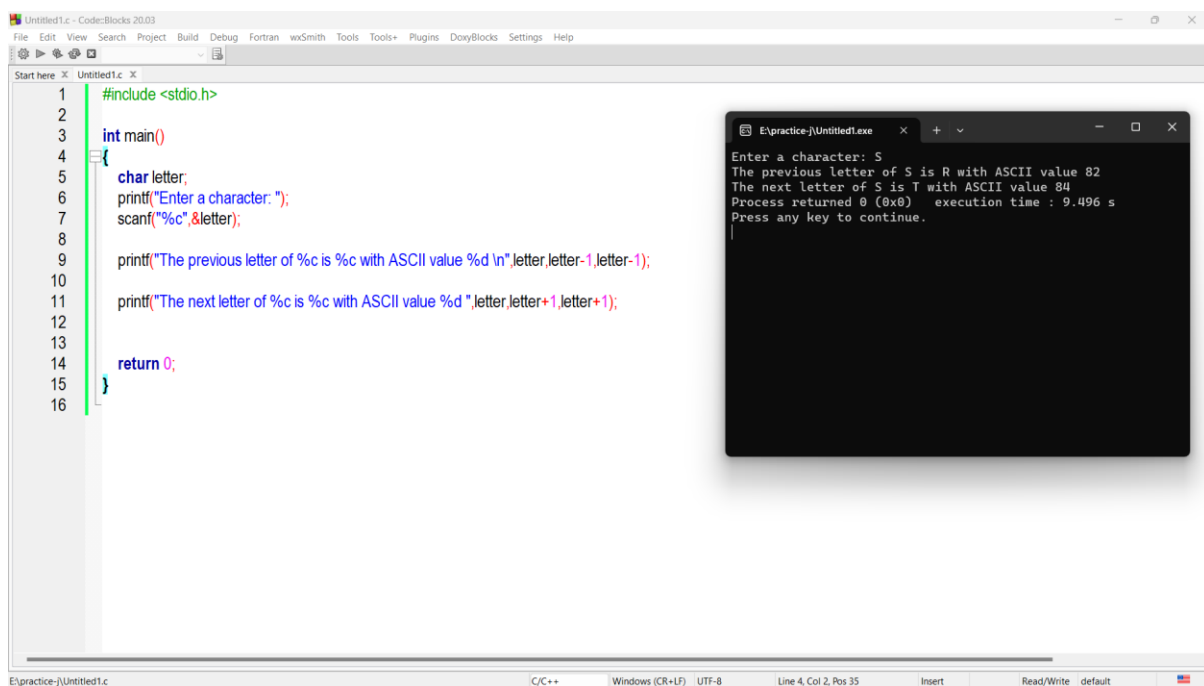
```
The value for option a is 8
The value for option b is 10
The value for option c is 16
The value for option d is 0
The value for option e is 4
The value for option f is 0
The value for option g is 0
Process returned 0 (0x0)   execution time : 0.388 s
Press any key to continue.
```

Problem No – 2

Ttile:

Write a C program to take a letter from English alphabet as input and display both the previous and the next letters with ASCII codes. Assume that input will always be chosen from B to Y or b to y.

Output:



The screenshot shows the Code::Blocks IDE with a C program open in the editor and its execution output in a separate window.

Code::Blocks Editor (Untitled1.c):

```
1 #include <stdio.h>
2
3 int main()
4 {
5     char letter;
6     printf("Enter a character: ");
7     scanf("%c",&letter);
8
9     printf("The previous letter of %c is %c with ASCII value %d \n",letter,letter-1,letter-1);
10
11     printf("The next letter of %c is %c with ASCII value %d ",letter,letter+1,letter+1);
12
13
14     return 0;
15 }
16
```

Execution Output (E:\practice-j\Untitled1.exe):

```
Enter a character: S
The previous letter of S is R with ASCII value 82
The next letter of S is T with ASCII value 84
Process returned 0 (0x0)   execution time : 9.496 s
Press any key to continue.
```

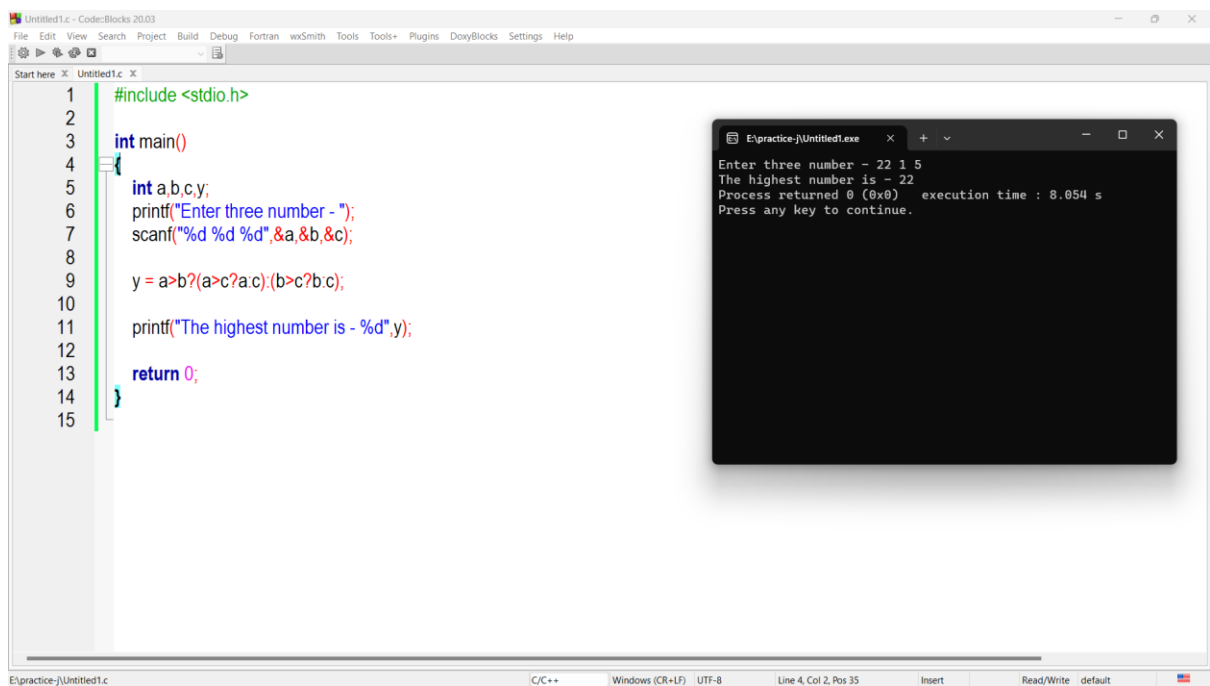
The status bar at the bottom of the IDE indicates: E:\practice-j\Untitled1.c | C/C++ | Windows (CR+LF) | UTF-8 | Line 4, Col 2, Pos 35 | Insert | Read/Write default | [Flag Icon]

Problem No – 3

Ttile:

Three numbers are input through keyboard. Write a program to find out the maximum and minimum of these three numbers.

Output:



The screenshot displays the Code::Blocks IDE with a C program in the editor and its execution output in a separate window.

Code in the editor:

```
1  #include <stdio.h>
2
3  int main()
4  {
5      int a,b,c,y;
6      printf("Enter three number - ");
7      scanf("%d %d %d",&a,&b,&c);
8
9      y = a>b?(a>c?a:c):(b>c?b:c);
10
11     printf("The highest number is - %d",y);
12
13     return 0;
14 }
15
```

Execution Output:

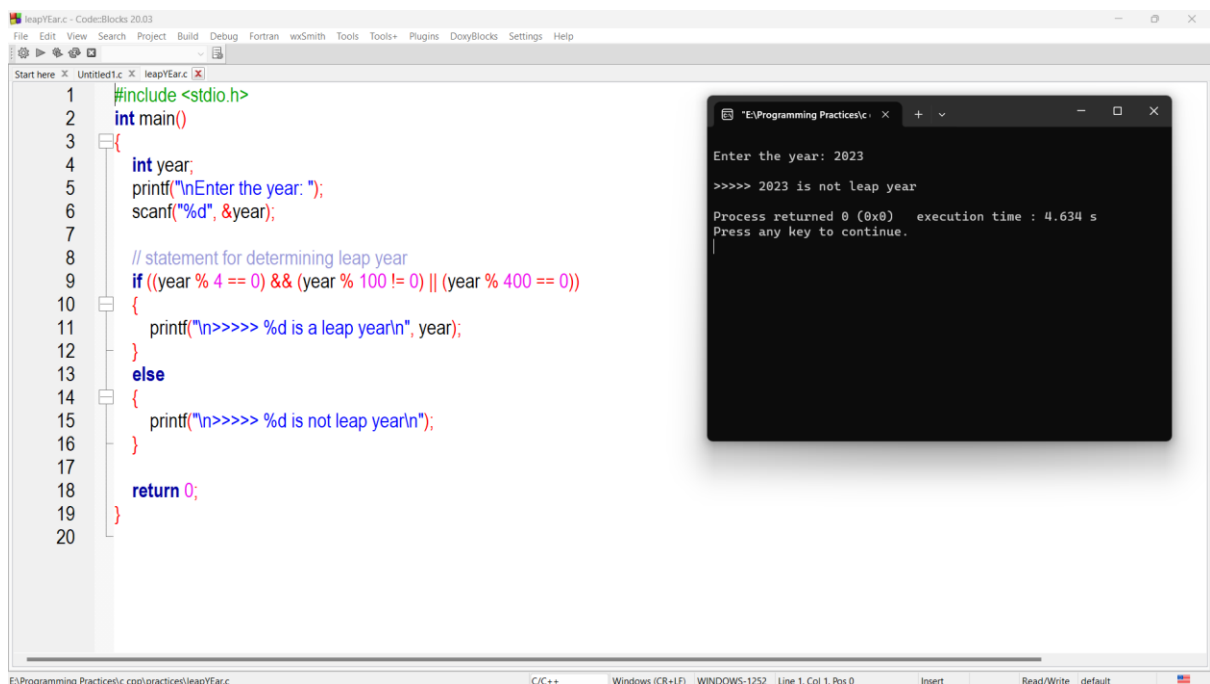
```
Enter three number - 22 1 5
The highest number is - 22
Process returned 0 (0x0)   execution time : 8.054 s
Press any key to continue.
```

Problem No – 4

Title:

Take a year as input and determine whether it is a leap year or not. [Hint: Check the input year is divisibility by 4 but not by 100 or by 400]

Output:



The image shows a screenshot of the CodeBlocks IDE with a C++ program for checking leap years. The program is named 'leapYear.c' and is located at 'E:\Programming Practices\c\practices\leapYear.c'. The code is as follows:

```
1 #include <stdio.h>
2 int main()
3 {
4     int year;
5     printf("\nEnter the year: ");
6     scanf("%d", &year);
7
8     // statement for determining leap year
9     if ((year % 4 == 0) && (year % 100 != 0) || (year % 400 == 0))
10    {
11        printf("\n>>>>> %d is a leap year\n", year);
12    }
13    else
14    {
15        printf("\n>>>>> %d is not leap year\n");
16    }
17
18    return 0;
19 }
20
```

The output window shows the execution of the program. It prompts the user to enter a year, and the user enters 2023. The program outputs: >>>>> 2023 is not leap year. The process returned 0 (0x0) and the execution time was 4.634 s. The user is prompted to press any key to continue.

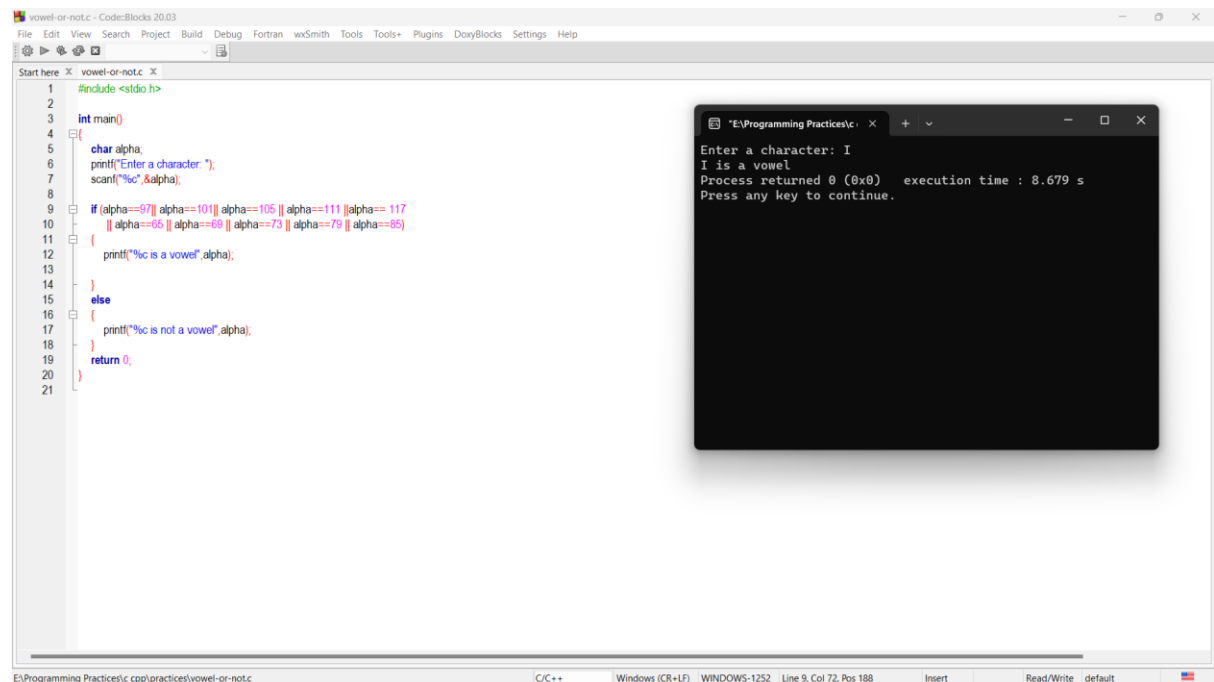
Problem No – 5

Ttitle:

Write a program to check whether input alphabet is vowel or not using if-else and switch statements.

Output:

with if else statement



The screenshot shows a C++ program in a Code::Blocks IDE. The program prompts the user to enter a character. If the character is a vowel (a, e, i, o, u), it prints "I is a vowel". Otherwise, it prints "I is not a vowel". The program returns 0 and the execution time is 8.679 s.

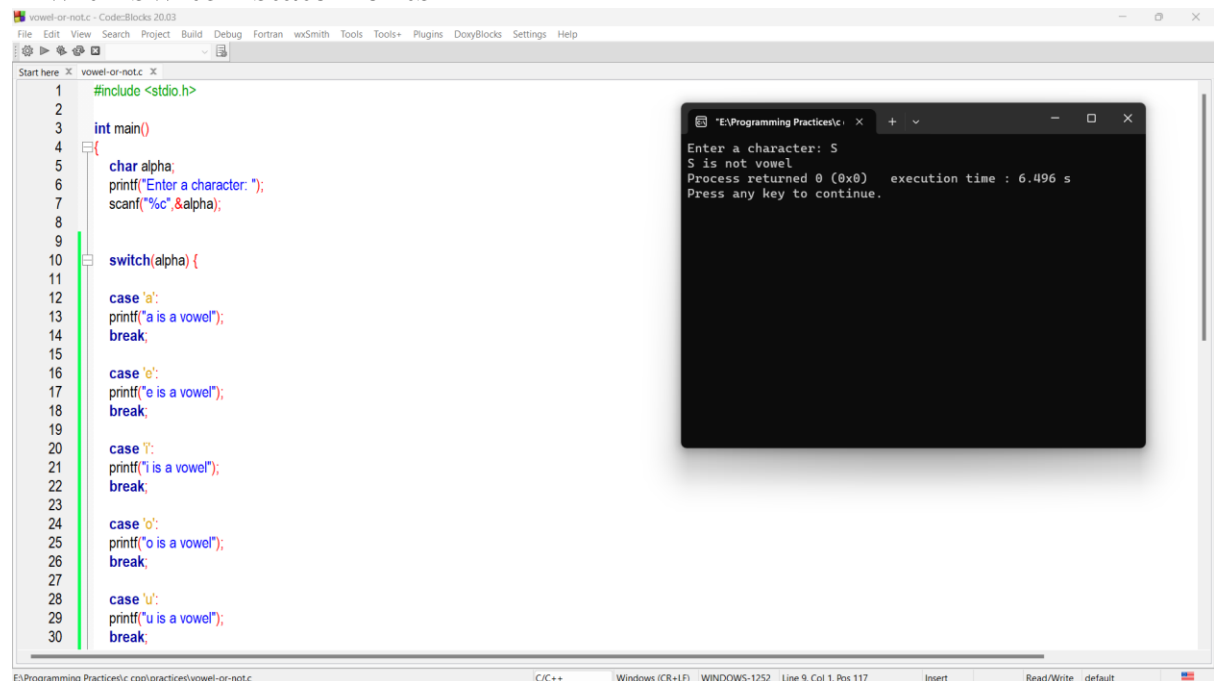
```
#include <stdio.h>

int main()
{
    char alpha;
    printf("Enter a character ");
    scanf("%c", &alpha);

    if (alpha == 'a' || alpha == 'e' || alpha == 'i' || alpha == 'o' || alpha == 'u')
    {
        printf("%c is a vowel", alpha);
    }
    else
    {
        printf("%c is not a vowel", alpha);
    }
    return 0;
}
```

Enter a character: I
I is a vowel
Process returned 0 (0x0) execution time : 8.679 s
Press any key to continue.

with switch statements



The screenshot shows a C++ program in a Code::Blocks IDE. The program prompts the user to enter a character. If the character is a vowel (a, e, i, o, u), it prints "I is a vowel". Otherwise, it prints "I is not vowel". The program returns 0 and the execution time is 6.496 s.

```
#include <stdio.h>

int main()
{
    char alpha;
    printf("Enter a character: ");
    scanf("%c", &alpha);

    switch(alpha) {
        case 'a':
            printf("a is a vowel");
            break;
        case 'e':
            printf("e is a vowel");
            break;
        case 'i':
            printf("i is a vowel");
            break;
        case 'o':
            printf("o is a vowel");
            break;
        case 'u':
            printf("u is a vowel");
            break;
        default:
            printf("I is not vowel");
    }
    return 0;
}
```

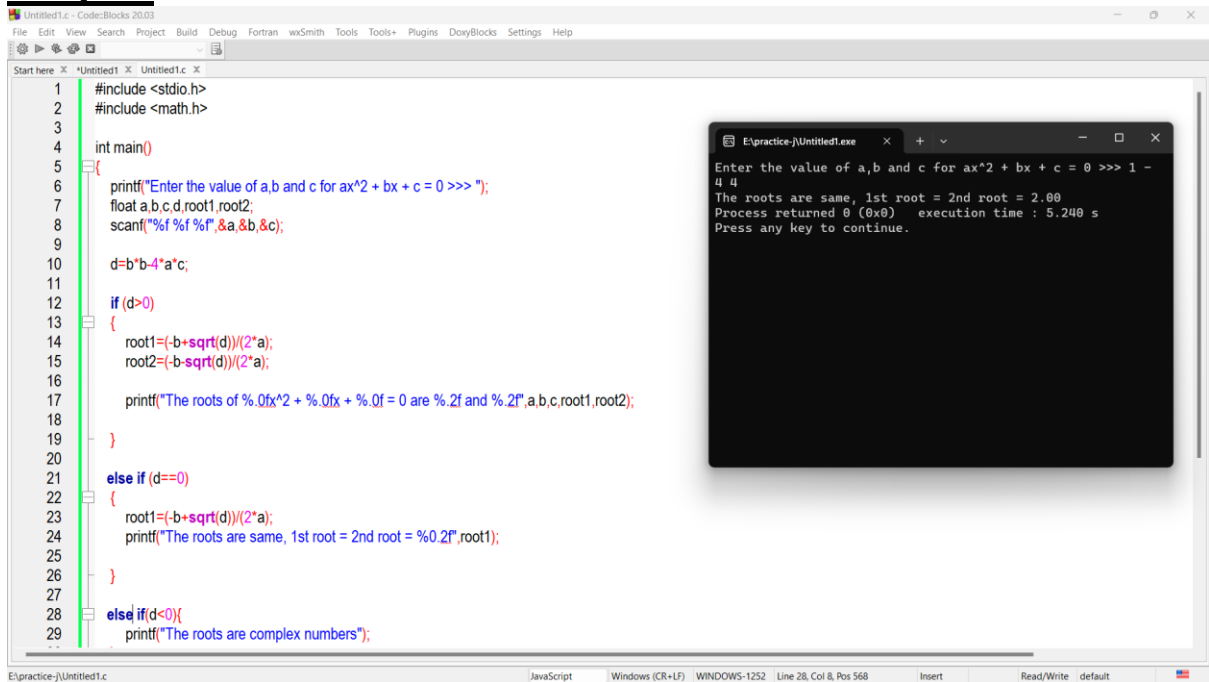
Enter a character: S
S is not vowel
Process returned 0 (0x0) execution time : 6.496 s
Press any key to continue.

Problem No – 6

Ttile:

Write a program to read the values of coefficients a, b and c of a quadratic equation $ax^2+bx+c=0$ and find roots of the equation.

Output:



The screenshot displays a C++ IDE with a source code editor on the left and a console window on the right. The source code is as follows:

```
1 #include <stdio.h>
2 #include <math.h>
3
4 int main()
5 {
6     printf("Enter the value of a,b and c for ax^2 + bx + c = 0 >>> ");
7     float a,b,c,d,root1,root2;
8     scanf("%f %f %f",&a,&b,&c);
9
10    d=b*b-4*a*c;
11
12    if (d>0)
13    {
14        root1=(-b+sqrt(d))/(2*a);
15        root2=(-b-sqrt(d))/(2*a);
16
17        printf("The roots of %.0fx^2 + %.0fx + %.0f = 0 are %.2f and %.2f",a,b,c,root1,root2);
18    }
19
20    else if (d==0)
21    {
22        root1=(-b+sqrt(d))/(2*a);
23        printf("The roots are same, 1st root = 2nd root = %.0.2f",root1);
24    }
25
26    else if (d<0){
27        printf("The roots are complex numbers");
28    }
29 }
```

The console window shows the execution of the program with the following output:

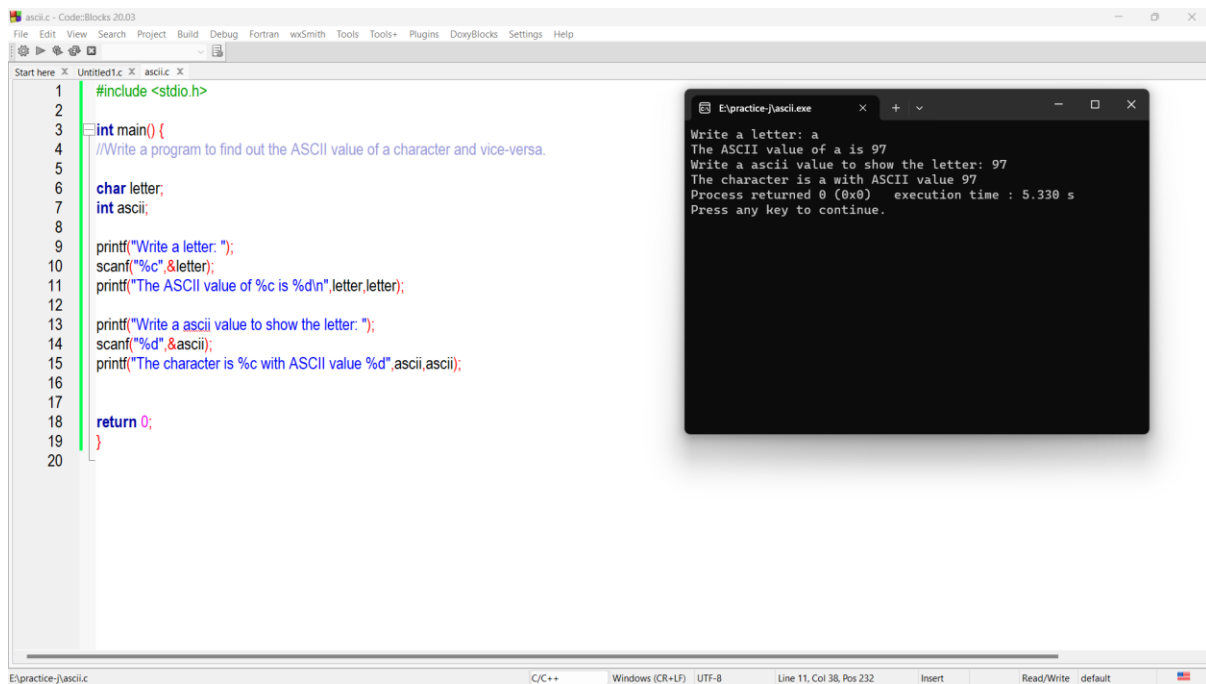
```
E:\practice-j\Untitled1.exe
Enter the value of a,b and c for ax^2 + bx + c = 0 >>> 1 -
4 4
The roots are same, 1st root = 2nd root = 2.00
Process returned 0 (0x0)   execution time : 5.240 s
Press any key to continue.
```

Problem No – 7

Title:

Write a program to find out the ASCII value of a character and vice-versa.

Output:



The screenshot displays a C++ IDE with a source code editor on the left and a console window on the right. The source code is as follows:

```
1 #include <stdio.h>
2
3 int main() {
4     //Write a program to find out the ASCII value of a character and vice-versa.
5
6     char letter;
7     int ascii;
8
9     printf("Write a letter: ");
10    scanf("%c", &letter);
11    printf("The ASCII value of %c is %d\n", letter, letter);
12
13    printf("Write a ascii value to show the letter: ");
14    scanf("%d", &ascii);
15    printf("The character is %c with ASCII value %d", ascii, ascii);
16
17    return 0;
18 }
19
20
```

The console window, titled "E:\practice-j\ascii.exe", shows the program's execution output:

```
Write a letter: a
The ASCII value of a is 97
Write a ascii value to show the letter: 97
The character is a with ASCII value 97
Process returned 0 (0x0)   execution time : 5.330 s
Press any key to continue.
```

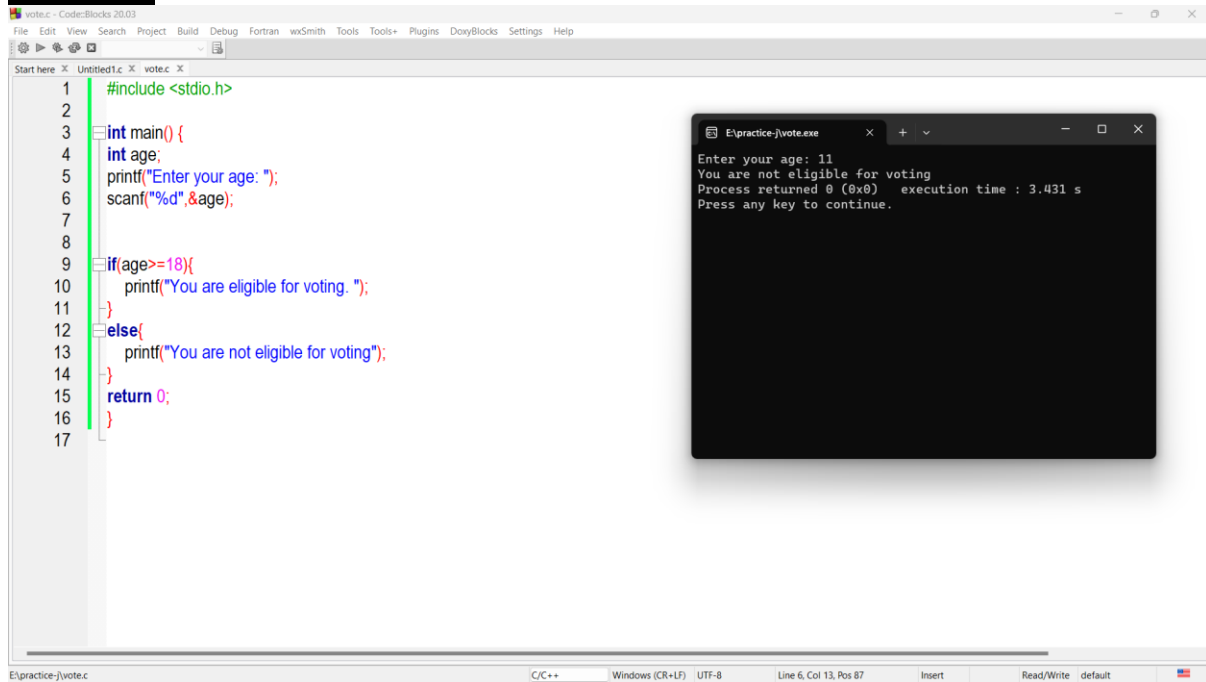
The status bar at the bottom of the IDE indicates the file is "E:\practice-j\ascii.c", the language is "C/C++", the encoding is "Windows (CR+LF)", the character set is "UTF-8", and the cursor is at "Line 11, Col 38, Pos 232".

Problem No – 8

Ttitle:

Write a program to check whether you are eligible to vote or not.

Output:



The screenshot shows the CodeBlocks IDE with a C++ program open in the editor. The program is designed to check if a user is eligible to vote based on their age. The code includes the standard input/output header, declares an integer for age, prompts the user for their age, and uses an if-else statement to determine eligibility. The execution window shows the program running with the input '11', resulting in the message 'You are not eligible for voting' and displaying the process return code and execution time.

```
1 #include <stdio.h>
2
3 int main() {
4     int age;
5     printf("Enter your age: ");
6     scanf("%d",&age);
7
8
9     if(age>=18){
10         printf("You are eligible for voting. ");
11     }
12     else{
13         printf("You are not eligible for voting");
14     }
15     return 0;
16 }
17
```

Execution Output:

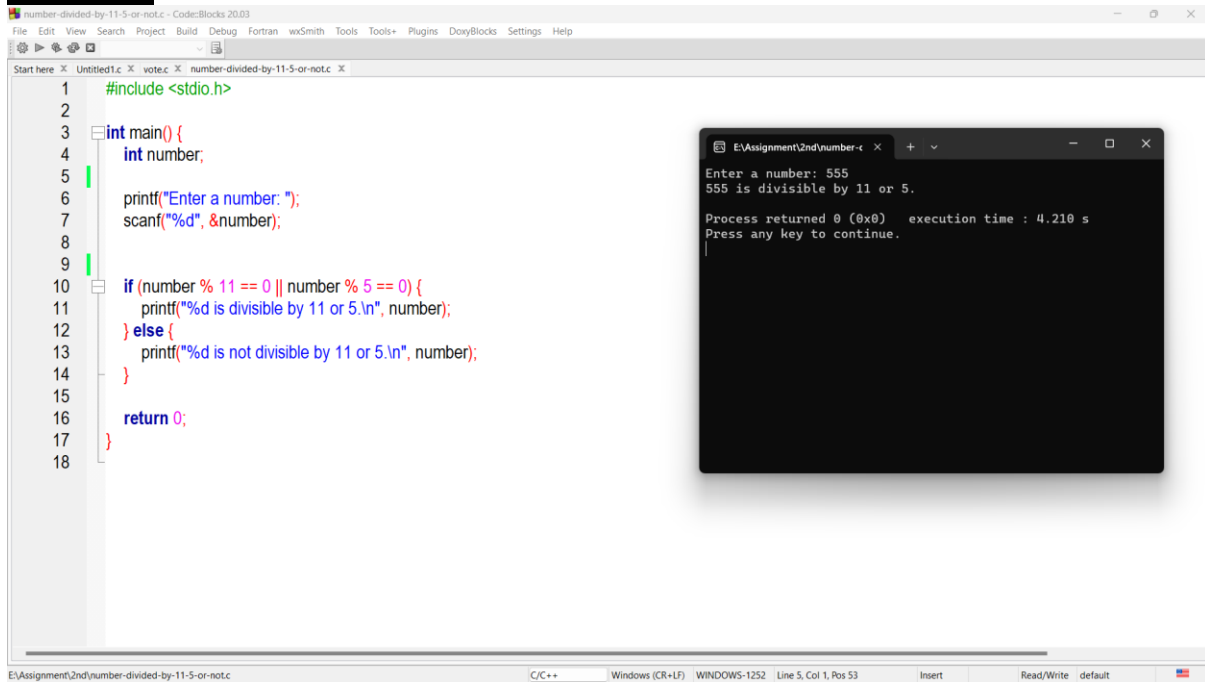
```
E:\practice-j\vote.exe
Enter your age: 11
You are not eligible for voting
Process returned 0 (0x0)   execution time : 3.431 s
Press any key to continue.
```

Problem No – 9

Title:

Write a program to check whether a number is divisible by 5 and 11 or not.

Output:



The screenshot displays a C++ IDE with a source code editor on the left and a console window on the right. The source code is as follows:

```
1  #include <stdio.h>
2
3  int main() {
4      int number;
5
6      printf("Enter a number: ");
7      scanf("%d", &number);
8
9
10     if (number % 11 == 0 || number % 5 == 0) {
11         printf("%d is divisible by 11 or 5.\n", number);
12     } else {
13         printf("%d is not divisible by 11 or 5.\n", number);
14     }
15
16     return 0;
17 }
18
```

The console window shows the program's execution with the input 555:

```
E:\Assignment\2nd\number.c x + -
Enter a number: 555
555 is divisible by 11 or 5.

Process returned 0 (0x0)   execution time : 4.210 s
Press any key to continue.
```

The status bar at the bottom indicates the file path is E:\Assignment\2nd\number-divided-by-11-5-or-not.c, the language is C/C++, and the window title is Windows (CR+LF).

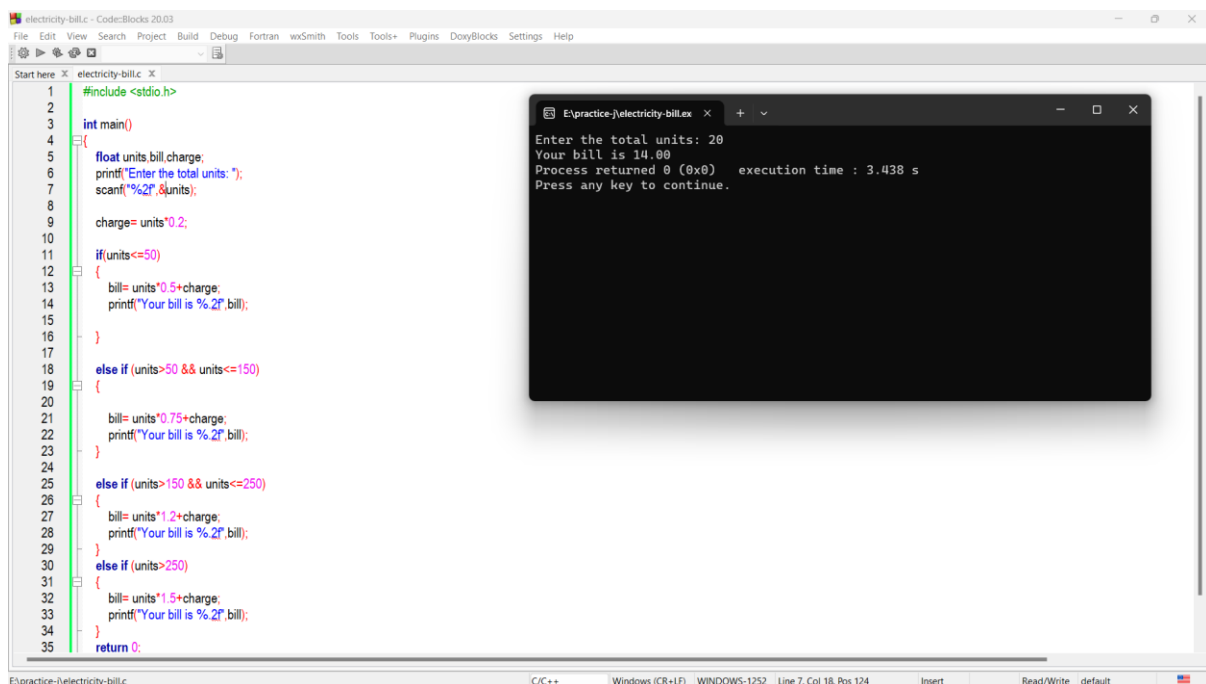
Problem No – 10

Ttile:

Write a C program to input electricity unit charges and calculate total electricity bill according to the given condition:

- For first 50 units Rs. 0.50/unit
- For next 100 units Rs. 0.75/unit
- For next 100 units Rs. 1.20/unit
- For unit above 250 Rs. 1.50/unit
- An additional surcharge of 20% is added to the bill

Output:



The screenshot shows a C program in a code editor and its execution output in a terminal window. The program calculates electricity bills based on unit charges and a 20% surcharge.

```
1 #include <stdio.h>
2
3 int main()
4 {
5     float units, bill, charge;
6     printf("Enter the total units: ");
7     scanf("%f", &units);
8
9     charge = units * 0.2;
10
11     if (units <= 50)
12     {
13         bill = units * 0.5 + charge;
14         printf("Your bill is %.2f", bill);
15     }
16
17     else if (units > 50 && units <= 150)
18     {
19
20         bill = units * 0.75 + charge;
21         printf("Your bill is %.2f", bill);
22     }
23
24     else if (units > 150 && units <= 250)
25     {
26         bill = units * 1.2 + charge;
27         printf("Your bill is %.2f", bill);
28     }
29
30     else if (units > 250)
31     {
32         bill = units * 1.5 + charge;
33         printf("Your bill is %.2f", bill);
34     }
35     return 0;
```

Execution output:

```
E:\practice-1\electricity-bill.exe
Enter the total units: 20
Your bill is 14.00
Process returned 0 (0x0)   execution time : 3.438 s
Press any key to continue.
```