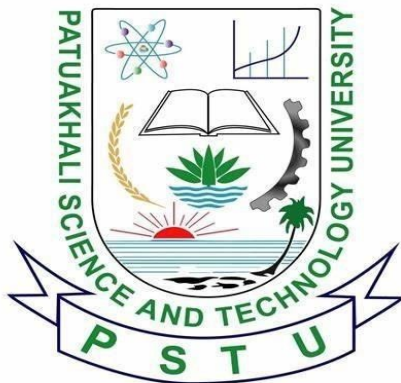


PATUAKHALI SCIENCE AND TECHNOLOGY UNIVERSITY



Course Code: CIT-112

SUBMITTED TO:

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Chapter 4

Multiple choice Question:

4.1 | ☒ All of the above are arithmetic operators,

4.2 | ☒ All of the above.

4.3 | ☒ All of the above are correct!

4.4 | ☒ ? =

4.5 | ☒ size of.

True or false

☒ True.

☒ True False

☒ False.

☒ False.

☒ False

☒ True.

☒ True

☒ True.

☒ True.

☒ False.

☒ True

☒ True

Fill in the blanks.

(a) Arithmetic.

(A) parentheses.

(b) 6.

(h) %

(c) sizeof

(i) ++ -- and ,

(d) Precedence

(j) relational, logical.

(e) logical.

(k)

(f) implicit type.

4.3 (a) True.

(b) False.

(c) True.

(d) True.

(e) False.

(f) False.

4.4 (a) False.

(b) True.

(c) True.

(d) True.

(e) False.

- 4.5/ (a) False.
 (b) False.
 (c) True.
 (d) False.

- 4.6/ (a) 0
 (b) 7
 (c) Not possible. Because 7.5 is a float number.
 And we cannot module a float number.
 (d) 2
 (e) -2
 (f) 10.25.
 (g) 7
 (h) not possible. Because 4.5 is not an integer.

4.8/ (a) $(x - (y/5) + z) \% 8 + 25$

(b) $(x - y) * p + 9$

(c) $(m * n) + (-x/y)$

(d) $x / (3 * y)$

4.9/ (a) False.

(b) True.

(c) True.

(d) False

(e) False.

4.10/ Output:

d
3

100

4.11/ Output:

110

112

4.12/ Output:

1

4.13/ Output:

200.

4.14/ Output:

$x \leq y$.

4.15/ There is an error in this program because we know that ~~if~~ else condition must contain 2 equal sign for a condition. But the program have one equal sign.

4.16 Output:

2

1

4

4.17 Output:

-40

40

Debugging Exercise:

4.1 $x \neq y \% x$; because we cannot module a float number.

4.2 ~~a~~ There will be two `ss`. But in the program we have one `s` only.

4.3 ~~a~~ 2.0 and -5.75 have no datatype and they are not store in a variable;

⑥ $s = 15$. There is no value for divide.

⑦ There is no ; at the end of the line.

Programming exercise

4.1 A program displays the right-most digit of the integral part of the number

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

```
int main()
```

```
{
```

```
int a,e;
```

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

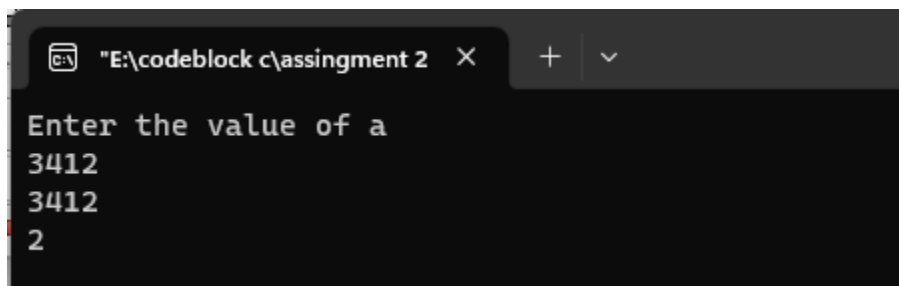
```
scanf("%d",&a);
```

```
e=a%10;
```

```
if(a>10)
```

```
printf("%d\n%d\n",a,e);
```

```
}
```

A screenshot of a code editor window with a dark theme. The title bar shows the file path "E:\codeblock c\assingment 2" and standard window controls. The editor area displays the output of the program: "Enter the value of a", followed by the input "3412", and then the output "3412" and "2" on separate lines.

```
"E:\codeblock c\assingment 2" × + ▾  
Enter the value of a  
3412  
3412  
2
```

4.2 Modify the above program to display the two rightmost digits of the integral part

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

```
int main()
```

```
{
```

```
int a,e;
```

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

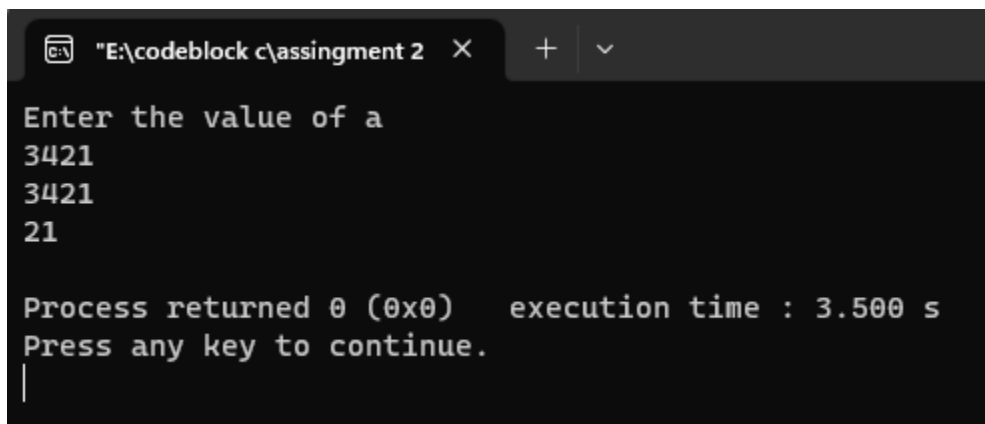
```
scanf("%d",&a);
```

```
e=a%100;
```

```
if(a>100)
```

```
printf("%d\n%d\n",a,e);
```

```
}
```



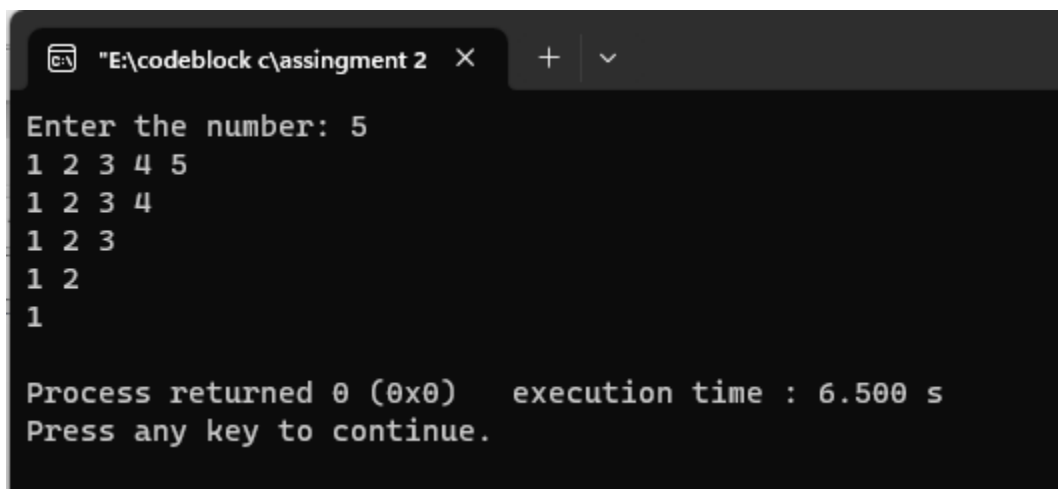
```
"E:\codeblock c\assingment 2" X + v
Enter the value of a
3421
3421
21

Process returned 0 (0x0)   execution time : 3.500 s
Press any key to continue.
|
```


4.3 Given an integer number, write a program that displays the number as follows: First line : all digits
Second line : all except first digit Third line : all except first two digits

```
#include<stdio.h>

int main()
{
    int n,i,x;
    printf("Enter the number: ");
    scanf("%d",&n);
    for(i=n;i>=1;i--)
    {
        for(x=1;x<=i;x++)
        {
            printf("%d ",x);
        }
        printf("\n");
    }
}
```



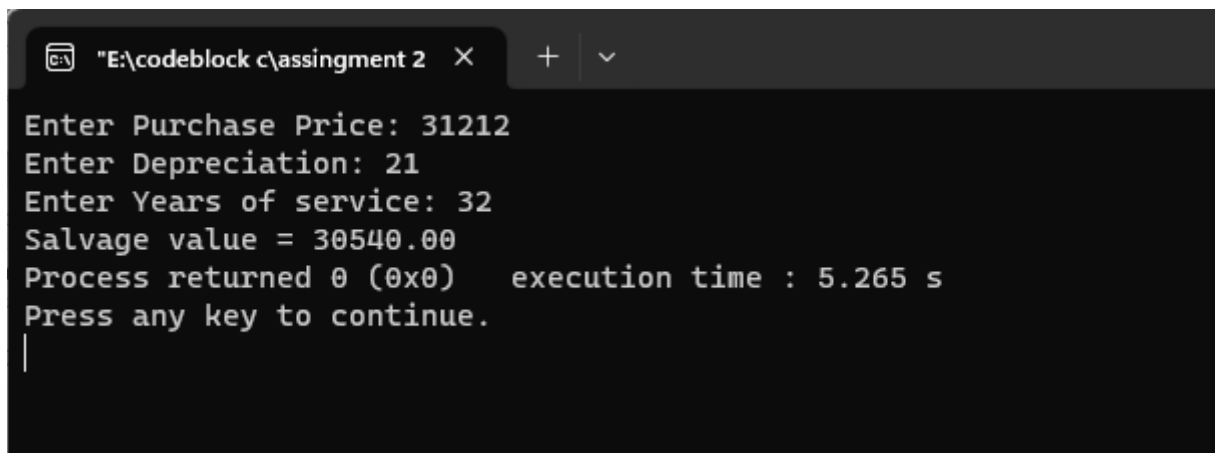
```
"E:\codeblock c\assingment 2" X + v
Enter the number: 5
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1

Process returned 0 (0x0)   execution time : 6.500 s
Press any key to continue.
```

4.4 a program to determine the salvage value of an item when the purchase price, years of service, and the annual depreciation are given

```
#include<stdio.h>

int main()
{
    //pp= purchase price;sv=salvage value;yos=years of service;
    //dep=Depreciation
    float pp,sv,yos;
    float dep
    printf("Enter Purchase Price: ");
    scanf("%f",&pp);
    printf("Enter Depreciation: ");
    scanf("%f",&dep);
    printf("Enter Years of service: ");
    scanf("%f",&yos);
    sv=pp-(yos*dep);
    printf("Salvage value = %0.2f",sv);
}
```



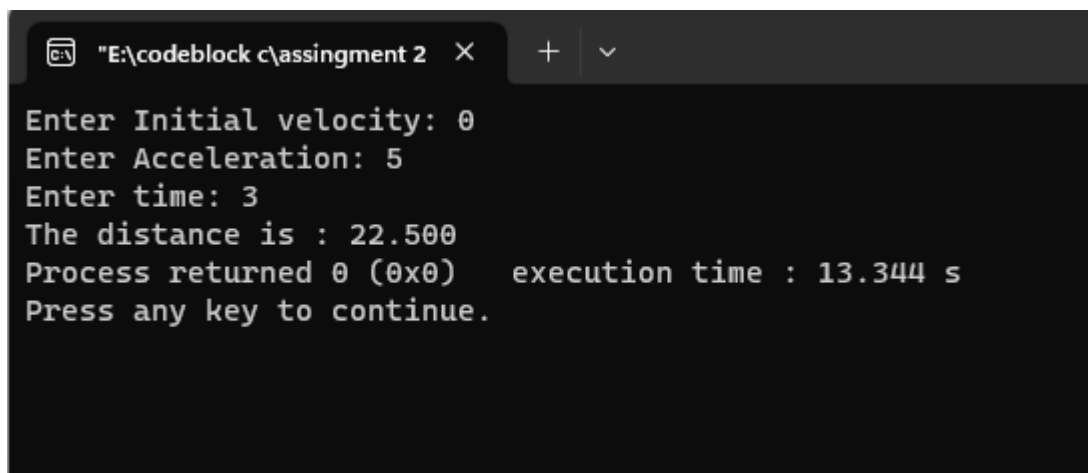
The screenshot shows a code editor window with a single tab titled "E:\codeblock c\assingment 2". The editor contains the C program code from the previous block. Below the code, the output of the program is displayed in a black console window. The output shows the user entering values for purchase price (31212), depreciation (21), and years of service (32). The program then calculates and displays the salvage value as 30540.00. It also shows the process returned 0 (0x0) and the execution time was 5.265 seconds. The console ends with the prompt "Press any key to continue." and a cursor line.

```
"E:\codeblock c\assingment 2" × + ▾
Enter Purchase Price: 31212
Enter Depreciation: 21
Enter Years of service: 32
Salvage value = 30540.00
Process returned 0 (0x0)   execution time : 5.265 s
Press any key to continue.
|
```

4.6 The total distance travelled by a vehicle in t seconds

```
#include<stdio.h>

int main()
{
    //a=acceleration;t=time;u=initial velocity;d=distance;
    float d,t,a,u;
    printf("Enter Initial velocity: ");
    scanf("%f",&u);
    printf("Enter Acceleration: ");
    scanf("%f",&a);
    printf("Enter time: ");
    scanf("%f",&t);
    d=(u*t+(a*t*t)/2);
    printf("The distance is : %0.3f",d);
}
```

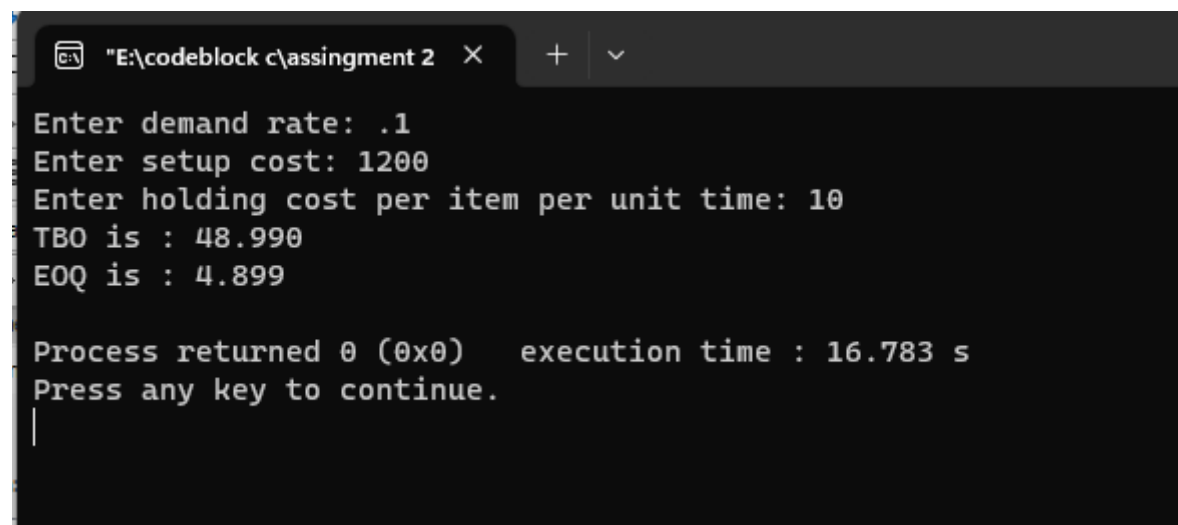


```
"E:\codeblock c\assingment 2" X + v
Enter Initial velocity: 0
Enter Acceleration: 5
Enter time: 3
The distance is : 22.500
Process returned 0 (0x0)    execution time : 13.344 s
Press any key to continue.
```

4.7 a program to compute EOQ and TBO, given demand rate (items per unit time), setup costs (per order), and the holding cost (per item per unit time).

```
#include<stdio.h>

int main()
/*
demand rate=dr ;setup cost = sc ;holding cost per item per unit time = hc ;
*/
{
    float TBO,EOQ,dr,sc,hc;
    printf("Enter demand rate: ");
    scanf("%f",&dr);
    printf("Enter setup cost: ");
    scanf("%f",&sc);
    printf("Enter holding cost per item per unit time: ");
    scanf("%f",&hc);
    EOQ = sqrt((2*dr*sc)/(hc));
    TBO = sqrt((2*sc)/(dr*hc));
    printf("TBO is : %0.3f\n",TBO);
    printf("EOQ is : %0.3f\n",EOQ);
}
```



```
"E:\codeblock c\assingment 2" X + v
Enter demand rate: .1
Enter setup cost: 1200
Enter holding cost per item per unit time: 10
TBO is : 48.990
EOQ is : 4.899

Process returned 0 (0x0)   execution time : 16.783 s
Press any key to continue.
|
```

4.8 a program to calculate the frequency for different values of C starting from 0.01 to 0.1 in steps of 0.01.

```
#include<stdio.h>

int main()
{
    double r,c,l,fr;

    //r=resistance;l=inductance;c=capacitance;fr=frequency;

    printf("Enter resistance: ");
    scanf("%lf",&r);
    printf("Enter inductance: ");
    scanf("%lf",&l);
    printf("Enter capacitance from 0.01 to 0.1: ");
    scanf("%lf",&c);
    fr=sqrt((1/(l*c))-((r*r)/(4*c*c)));
    printf("The Frequency is %0.2lf",fr);
}
```

4.9 a program to read a four digit integer and print the sum of its digits

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

```
int main()
```

```
{
```

```
    int n,sum=0,r,x;
```

```
    printf("Enter a number of four digits: ");
```

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

```
    while(n!=0){
```

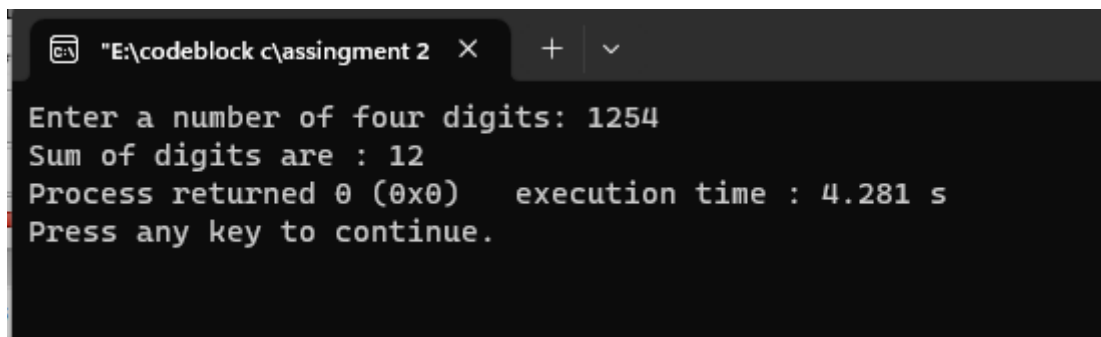
```
        r=n%10;
```

```
        sum=sum+r;
```

```
        n=n/10;}
```

```
    printf("Sum of digits are : %d",sum);
```

```
}
```



```
"E:\codeblock c\assingment 2" × + v
Enter a number of four digits: 1254
Sum of digits are : 12
Process returned 0 (0x0)   execution time : 4.281 s
Press any key to continue.
```

4.10 a program to read three values from keyboard and print out the largest of them without using if statement.

```
#include<stdio.h>

int main()
{
    int n1,n2,n3;

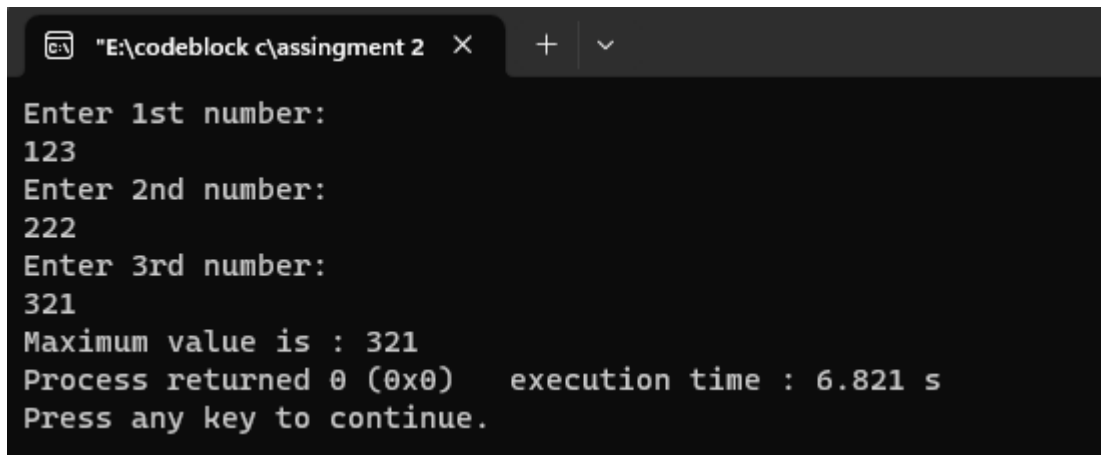
    printf("Enter 1st number: \n");
    scanf("%d",&n1);

    printf("Enter 2nd number: \n");
    scanf("%d",&n2);

    printf("Enter 3rd number: \n");
    scanf("%d",&n3);

    int maximum = (n1>n2) ? ((n1 > n3) ? n1 : n3) : ((n2 > n3) ? n2 : n3);
    printf("Maximum value is : %d",maximum);

}
```



```
"E:\codeblock c\assingment 2" X + v
Enter 1st number:
123
Enter 2nd number:
222
Enter 3rd number:
321
Maximum value is : 321
Process returned 0 (0x0)   execution time : 6.821 s
Press any key to continue.
```

4.11 a program to read two integer values m and n and to decide and print whether m is a multiple of n.

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

```
int main()
```

```
{
```

```
    int m,n;
```

```
    printf("Enter a number(n): ");
```

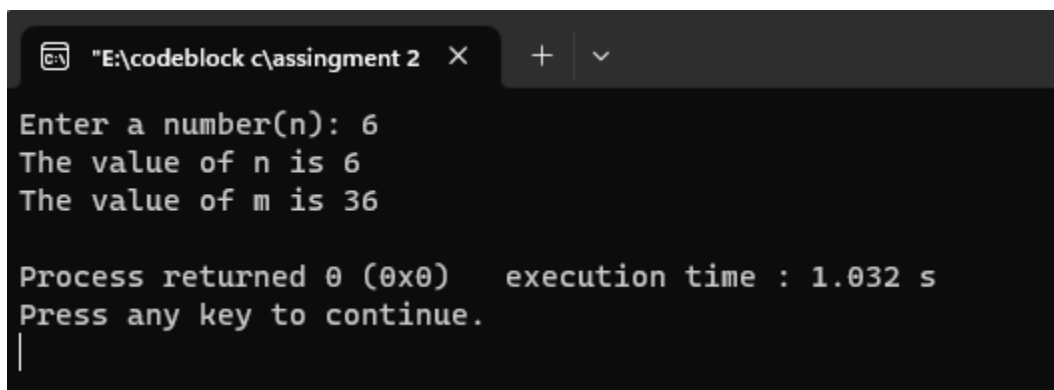
```
    scanf("%d",&n);
```

```
    m=n*n;
```

```
    printf("The value of n is %d\n",n);
```

```
    printf("The value of m is %d\n",m);
```

```
}
```



```
"E:\codeblock c\assingment 2" X + v
Enter a number(n): 6
The value of n is 6
The value of m is 36

Process returned 0 (0x0)   execution time : 1.032 s
Press any key to continue.
|
```


4.12 a program to read three values using scanf statement and print the following results: (a) Sum of the values (b) Average of the three values (c) Largest of the three (d) Smallest of the three

```
#include<stdio.h>

int main()
{
    int n1,n2,n3;
    printf("Enter 1st number: \n");
    scanf("%d",&n1);
    printf("Enter 2nd number: \n");
    scanf("%d",&n2);
    printf("Enter 3rd number: \n");
    scanf("%d",&n3);
    if(n1>n2&& n1>n3)
        printf("%d is large number. \n",n1);
    else if(n2>n1&& n2>n3)
        printf("%d is large number. \n",n2);
    else
        printf("%d is large number. \n",n3);
    printf("\n\n");
    if(n1<n2&& n1<n3)
        printf("%d is small number. \n",n1);
    else if(n2<n1&& n2<n3)
        printf("%d is small number. \n",n2);
    else
        printf("%d is small number. \n",n3);

    printf("\n\n");

    int sum=n1+n2+n3;
```

```
float av= sum/3;
```

```
printf("The sum of three digits are: %d\n\n",sum);
```

```
printf("The average of three digits are: %f\n\n",av);
```

```
}
```

```
"E:\codeblock c\assingment 2" X + v
Enter 1st number:
31
Enter 2nd number:
321
Enter 3rd number:
33
321 is large number.

31 is small number.

The sum of three digits are: 385

The average of three digits are: 128.000000

Process returned 0 (0x0)   execution time : 5.781 s
Press any key to continue.
```

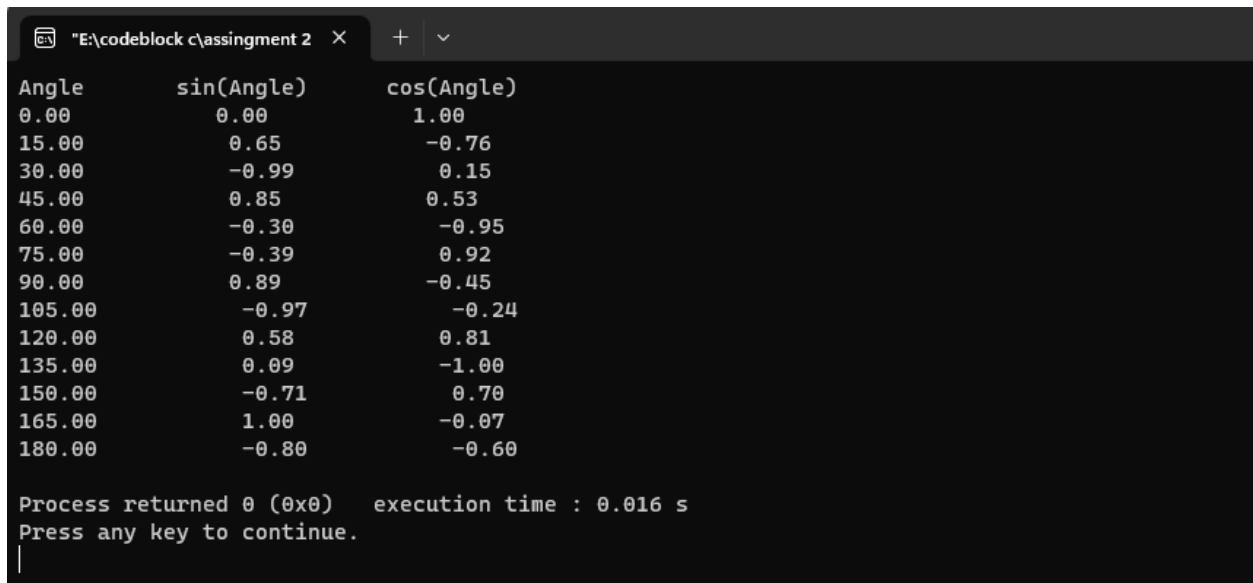
4.14 a program to print a table of sin and cos functions for the interval from 0 to 180 degrees in increments of 15

```
#include<stdio.h>

#include<math.h>

int main()
{
    float x,y,i;

    printf("Angle    sin(Angle)    cos(Angle)\n");
    for(i=0;i<=180;i=i+15)
    {
        x=sin(i);
        y=cos(i);
        printf("%0.2f    %0.2f    %0.2f\n",i,x,y);
    }
}
```



```
"E:\codeblock c\assingment 2" X + v
Angle    sin(Angle)    cos(Angle)
0.00      0.00      1.00
15.00      0.65     -0.76
30.00     -0.99      0.15
45.00      0.85      0.53
60.00     -0.30     -0.95
75.00     -0.39      0.92
90.00      0.89     -0.45
105.00     -0.97     -0.24
120.00      0.58      0.81
135.00      0.09     -1.00
150.00     -0.71      0.70
165.00      1.00     -0.07
180.00     -0.80     -0.60

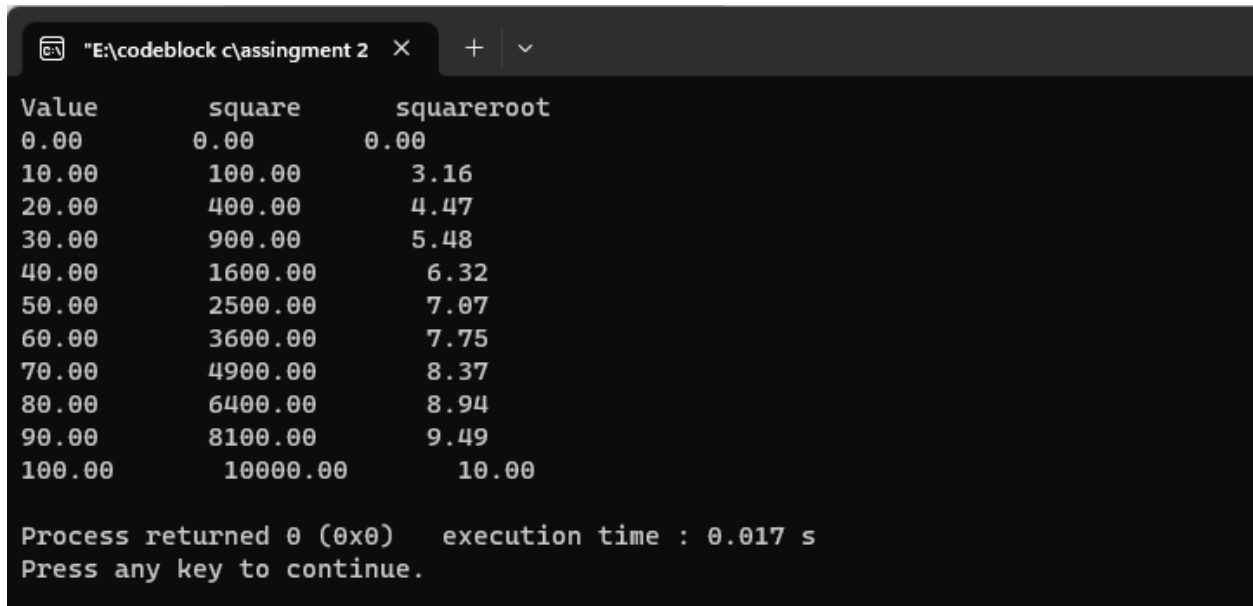
Process returned 0 (0x0)   execution time : 0.016 s
Press any key to continue.
|
```

4.15 a program to compute the values of squareroots and squares of the numbers 0 to 100 in steps 10 and print the output in a tabular form

```
#include<stdio.h>

int main()
{
    float i,x,y;

    printf("Value    square    squareroot\n");
    for(i=0;i<=100;i=i+10)
    {
        x=i*i;
        y=sqrt(i);
        printf("%0.2f    %0.2f    %0.2f\n",i,x,y);
    }
}
```



```
"E:\codeblock c\assingment 2" X + v
```

Value	square	squareroot
0.00	0.00	0.00
10.00	100.00	3.16
20.00	400.00	4.47
30.00	900.00	5.48
40.00	1600.00	6.32
50.00	2500.00	7.07
60.00	3600.00	7.75
70.00	4900.00	8.37
80.00	6400.00	8.94
90.00	8100.00	9.49
100.00	10000.00	10.00

Process returned 0 (0x0) execution time : 0.017 s
Press any key to continue.

4.17 a C program to shift the given data by two bits to the left.

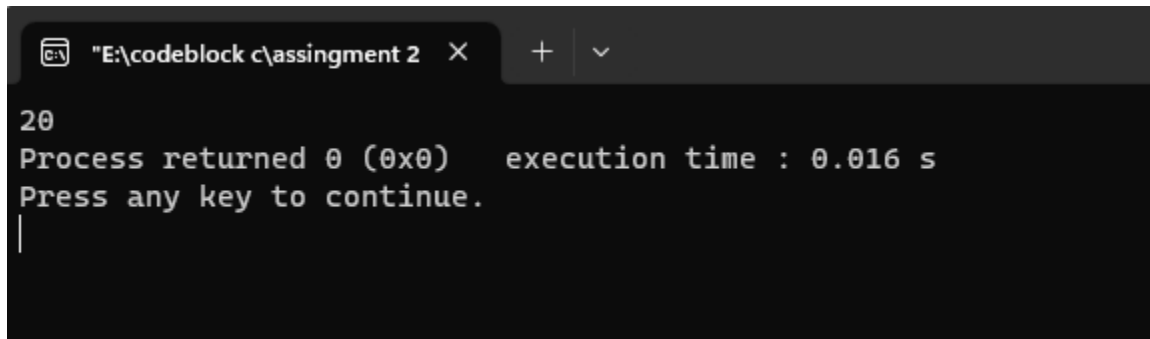
```
#include<stdio.h>
```

```
int main(){
```

```
    int d =5;
```

```
    printf("%d", (d<<2));
```

```
}
```



```
"E:\codeblock c\assingment 2" X + v
20
Process returned 0 (0x0)   execution time : 0.016 s
Press any key to continue.
|
```

4.18 a C program to compute the value of the expression $x = a - b/3 + c*2 - 1$.

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

```
int main()
```

```
{
```

```
    float a,b,c,x;
```

```
    printf("Enter a: ");
```

```
    scanf("%f",&a);
```

```
    printf("Enter b: ");
```

```
    scanf("%f",&b);
```

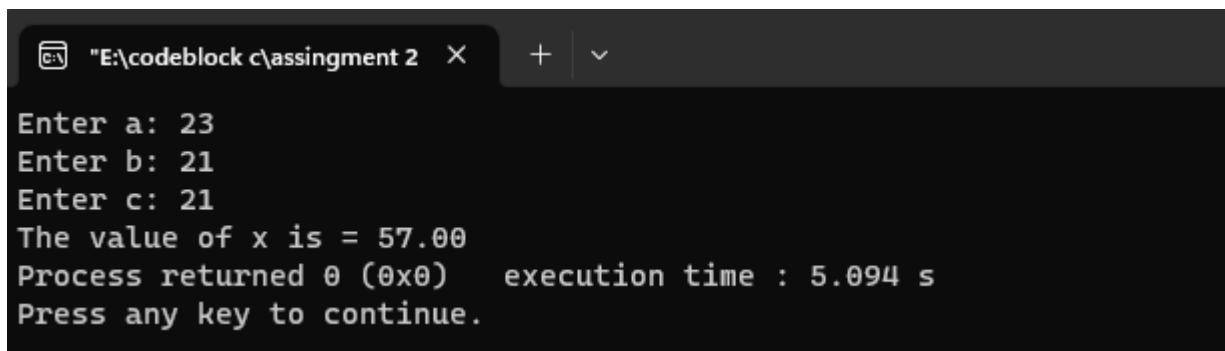
```
    printf("Enter c: ");
```

```
    scanf("%f",&c);
```

```
    x=a-b/3+c*2-1;
```

```
    printf("The value of x is = %0.2f",x);
```

```
}
```

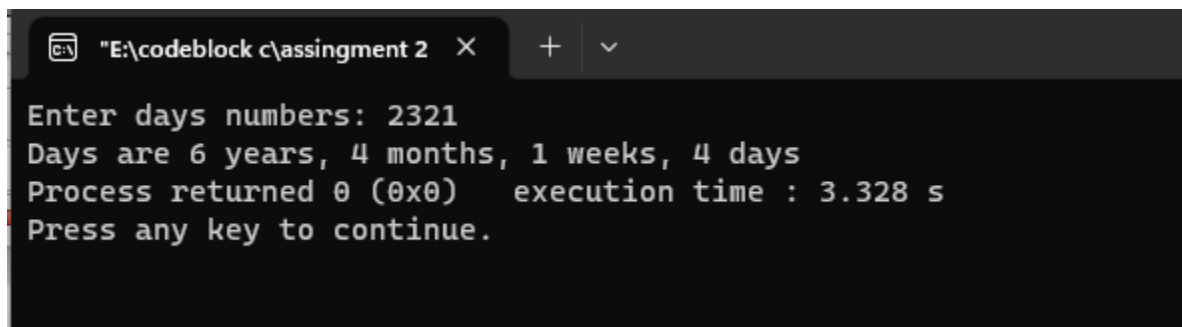
A screenshot of a terminal window showing the execution of a C program. The window title is "E:\codeblock c\assingment 2". The output shows the user entering values for a, b, and c, and the program calculating the value of x. The execution time is 5.094 s.

```
"E:\codeblock c\assingment 2" X + v
Enter a: 23
Enter b: 21
Enter c: 21
The value of x is = 57.00
Process returned 0 (0x0)   execution time : 5.094 s
Press any key to continue.
```

4.20 a C program to input a date value and determine whether the entered day, month, and year values are valid.

```
#include<stdio.h>

int main()
{
    int year,t,rd,rd2,month,week,days;
    printf("Enter days numbers: ");
    scanf("%d",&t);
    //rh=remain second after getting hours
    year=t/365;
    rd=t%365;
    month=rd/30;
    rd2=rd%30;
    week=rd2/7;
    days=rd2%7;
    printf("Days are %d years, %d months, %d weeks, %d days",year,month,week,days);
    return 0;
}
```



```
"E:\codeblock c\assingment 2" X + v
Enter days numbers: 2321
Days are 6 years, 4 months, 1 weeks, 4 days
Process returned 0 (0x0)   execution time : 3.328 s
Press any key to continue.
```

4.20 a C program to input the sides of a triangle and determine whether the triangle is isosceles or not.

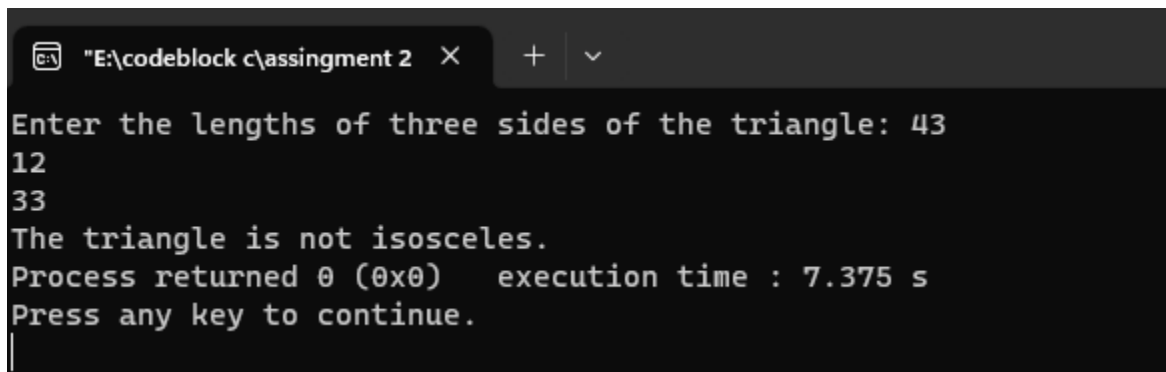
```
#include <stdio.h>

int main() {
    int side1, side2, side3;

    // Read the lengths of three sides of the triangle
    printf("Enter the lengths of three sides of the triangle: ");
    scanf("%d %d %d", &side1, &side2, &side3);

    // Check if the triangle is isosceles or not
    if (side1 == side2 || side1 == side3 || side2 == side3) {
        printf("The triangle is isosceles.");
    } else {
        printf("The triangle is not isosceles.");
    }

    return 0;
}
```

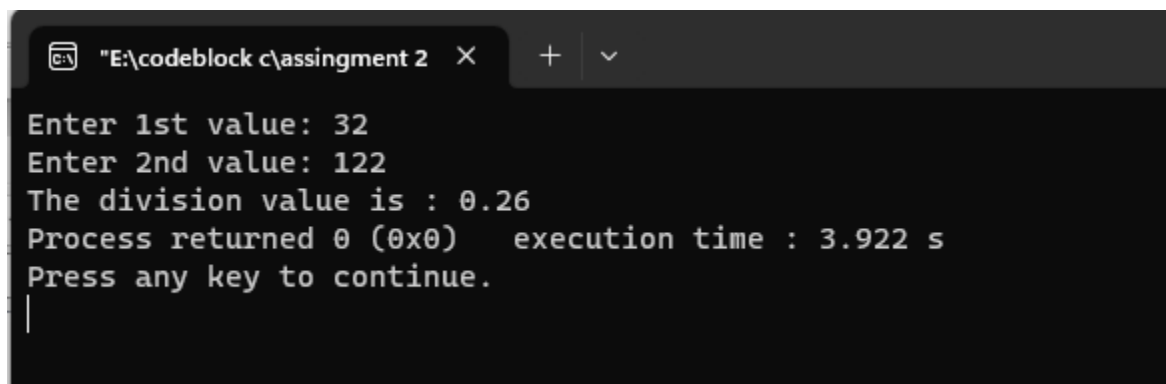


```
"E:\codeblock c\assingment 2" X + v
Enter the lengths of three sides of the triangle: 43
12
33
The triangle is not isosceles.
Process returned 0 (0x0) execution time : 7.375 s
Press any key to continue.
|
```


4.21 a C program that reads two numbers and performs their division. If the division is not possible, then an error message, 'Division not possible' is displayed.

```
#include<stdio.h>

int main()
{
    float x,y,z;
    printf("Enter 1st value: ");
    scanf("%f",&x);
    printf("Enter 2nd value: ");
    scanf("%f",&y);
    z=x/y;
    if(y==0)
        printf("division not possible");
    else
        printf("The division value is : %0.2f",z);
}
```



The screenshot shows a code editor window with the title bar "E:\codeblock c\assingment 2". The editor contains the C program code. Below the code, the output of the program is displayed in a terminal window. The output shows the user entering 32 for the first value and 122 for the second value. The program then calculates the division and displays the result as 0.26. The terminal also shows the process returned 0 (0x0) and the execution time was 3.922 seconds. The prompt "Press any key to continue." is shown at the bottom of the terminal window.

```
Enter 1st value: 32
Enter 2nd value: 122
The division value is : 0.26
Process returned 0 (0x0)   execution time : 3.922 s
Press any key to continue.
|
```

4.22 the value of 4 variables a, b, c and d and compute the resultant value of following expressions: $(a + b) * (c / d)$ $(a + b) * c / d$ $a + (b * c) / d$

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

```
int main()
```

```
{
```

```
    float x,y,z,a,b,c,d;
```

```
    printf("Enter a: ");
```

```
    scanf("%f",&a);
```

```
    printf("Enter b: ");
```

```
    scanf("%f",&b);
```

```
    printf("Enter c: ");
```

```
    scanf("%f",&c);
```

```
    printf("Enter d: ");
```

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

```
    x=(a+b)*(c/d);
```

```
    y=(a+b)*c/d;
```

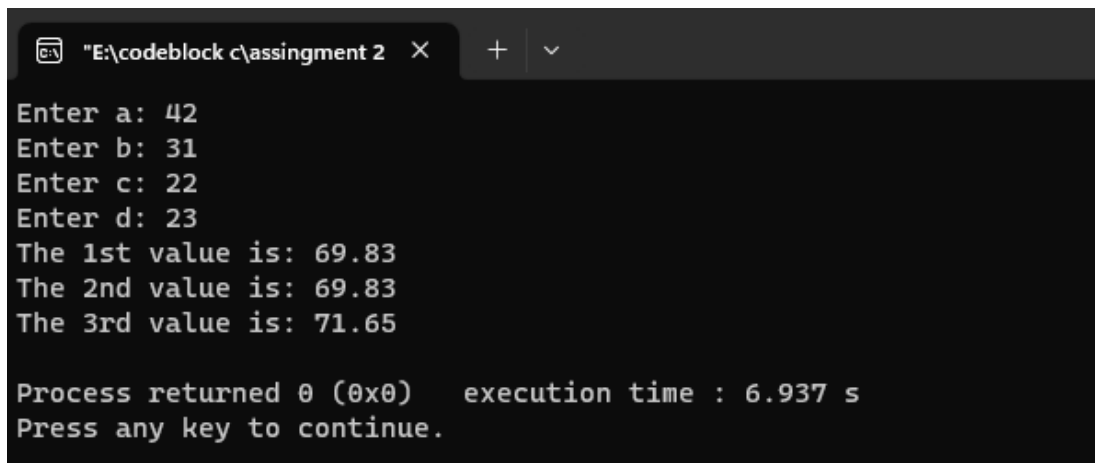
```
    z=a+(b*c)/d;
```

```
    printf("The 1st value is: %0.2f\n",x);
```

```
    printf("The 2nd value is: %0.2f\n",y);
```

```
    printf("The 3rd value is: %0.2f\n",z);
```

```
}
```



```
"E:\codeblock c\assingment 2" X + v
Enter a: 42
Enter b: 31
Enter c: 22
Enter d: 23
The 1st value is: 69.83
The 2nd value is: 69.83
The 3rd value is: 71.65

Process returned 0 (0x0)   execution time : 6.937 s
Press any key to continue.
```