

**Batch: C5\_3      Roll No.: 16010123320**

**Experiment / assignment / tutorial No. 1**

**Grade: AA / AB / BB / BC / CC / CD / DD**

**Signature of the Staff In-charge with date**

**TITLE:** Write a program for:

- Program to find area and circumference of various Geometric shapes.
- Program to calculate EMI (Equated Monthly Instalment) of loan amount if principal, rate of interest and time in years is given by the user.

$$E = (P.r.(1+r)^n) / ((1+r)^n - 1)$$

**AIM:** Write a program for:

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**Expected OUTCOME of Experiment:**

- Find area and circumference of various Geometric shapes
- To calculate EMI

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**Books/ Journals/ Websites referred:**

- Programming in ANSI C, E. Balagurusamy, 7 th Edition, 2016, McGraw-Hill Education, India.
- Structured Programming Approach, Pradeep Dey and Manas Ghosh, 1 st Edition, 2016, Oxford University Press, India.
- Let Us C, Yashwant Kanetkar, 15th Edition, 2016, BPB Publications, India.

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**Problem Definition:**

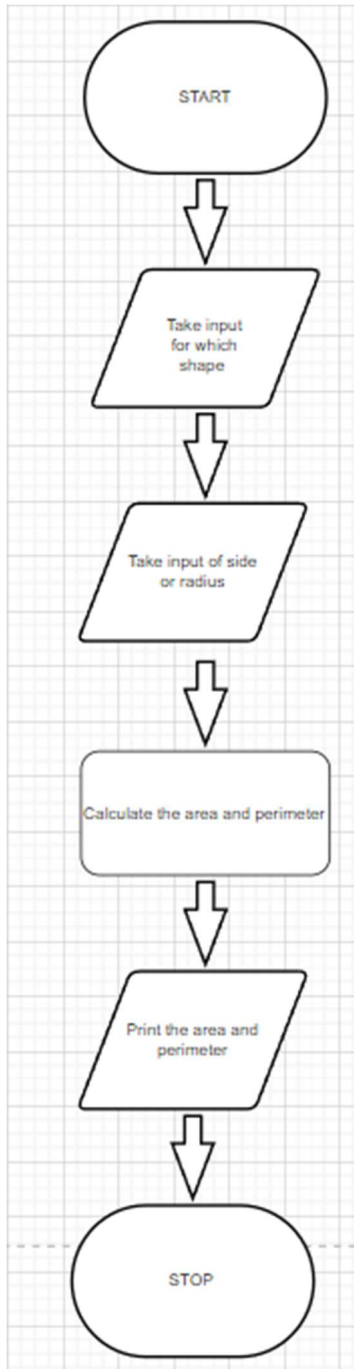
**Problem 1:** Area and Circumference of any shape(will be given by instructor) (example Circle)  
Ask the user to enter the value of the radius of a circle. Put the values in the formula for finding area of a circle and circumference of a circle and print the outcome for area of a circle and circumference of a circle

**Problem 2:** Calculating EMI Ask the user to enter the value of principal amount, rate of interest and time (in years).Store the value in E and print the final monthly instalment E as an outcome.

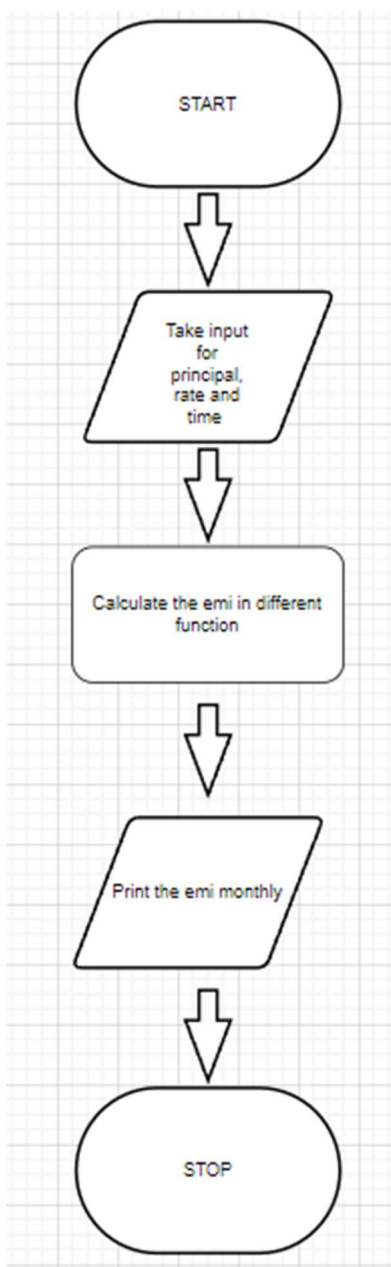
Formula to be used:  $(E = (P.r.(1+r)^n) / ((1+r)^n - 1))$

**Flowchart:**

1)

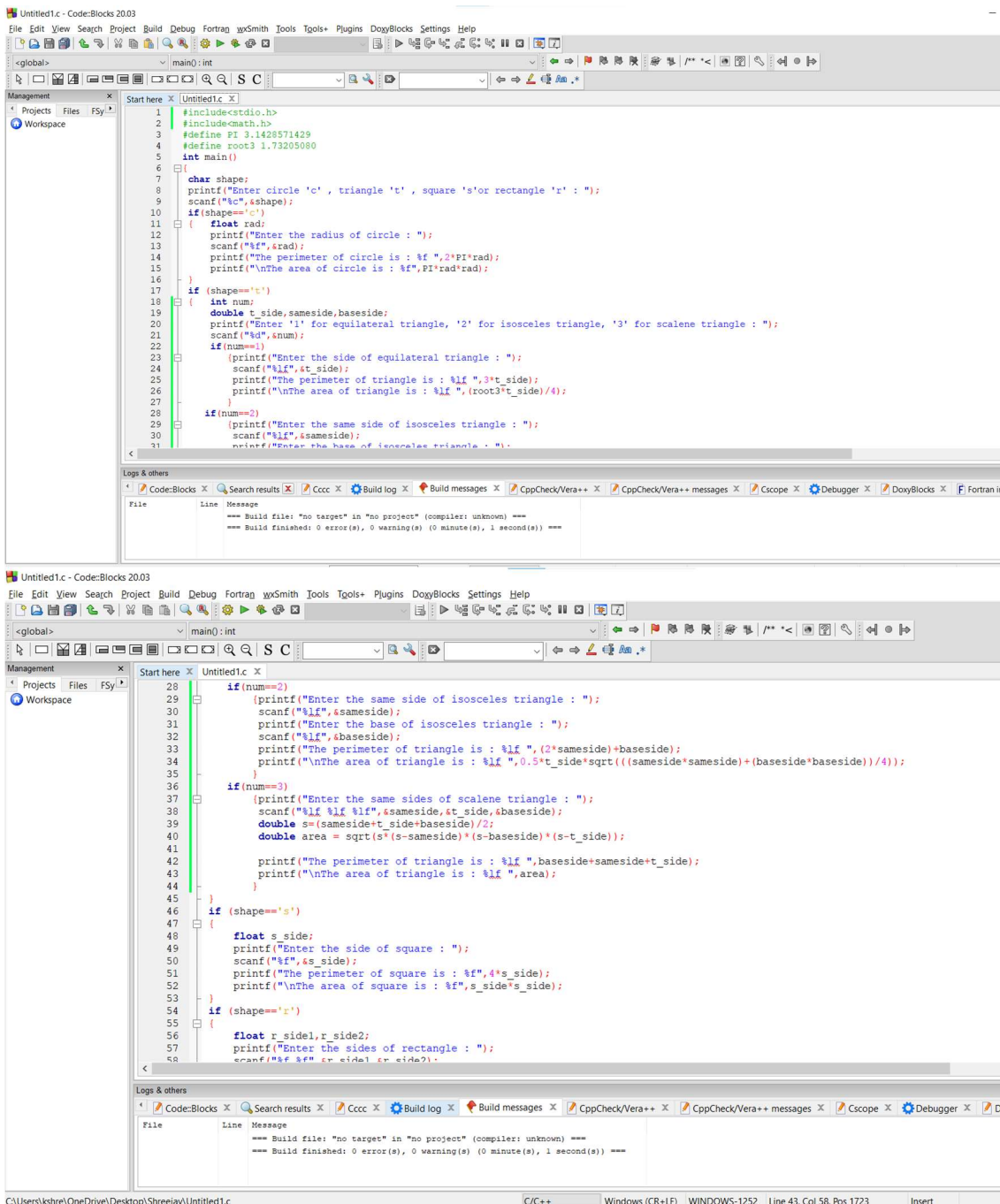


2)



**Implementation details:**

**1)**

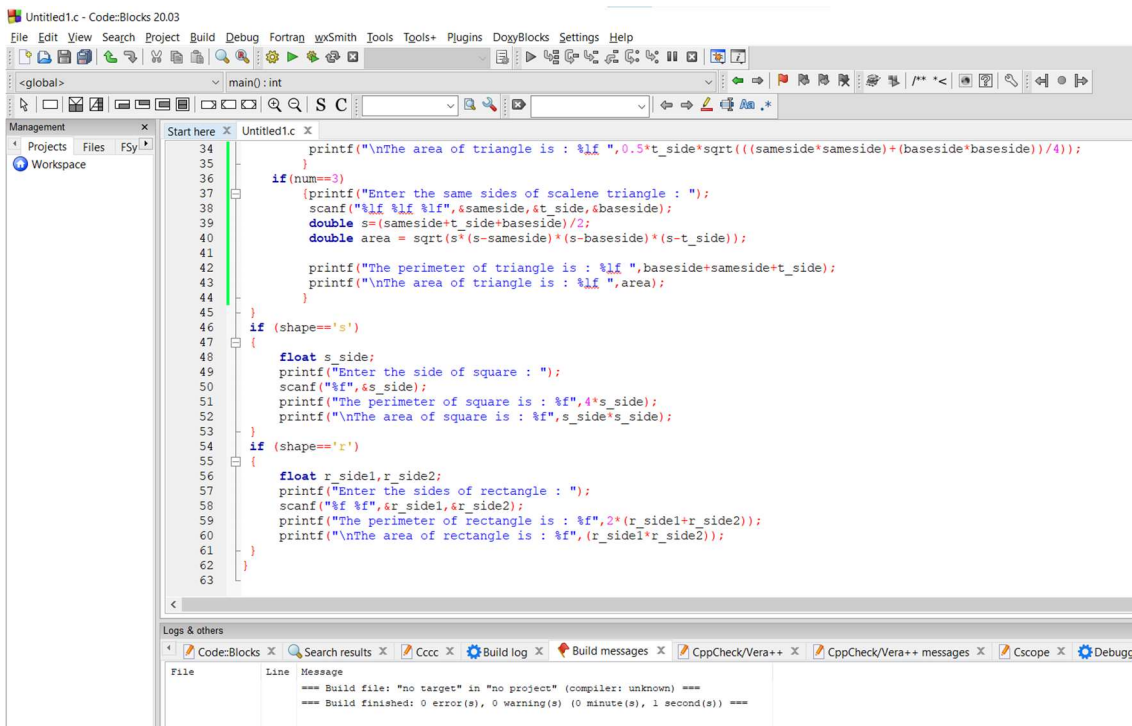


```

1 #include<stdio.h>
2 #include<math.h>
3 #define PI 3.1428571429
4 #define root3 1.73205080
5 int main()
6 {
7     char shape;
8     printf("Enter circle 'c' , triangle 't' , square 's' or rectangle 'r' : ");
9     scanf("%c",&shape);
10    if(shape=='c')
11    {
12        float rad;
13        printf("Enter the radius of circle : ");
14        scanf("%f",&rad);
15        printf("The perimeter of circle is : %f ",2*PI*rad);
16        printf("\nThe area of circle is : %f",PI*rad*rad);
17    }
18    if (shape=='t')
19    {
20        int num;
21        double t_side,sameside,baseside;
22        printf("Enter '1' for equilateral triangle, '2' for isosceles triangle, '3' for scalene triangle : ");
23        scanf("%d",&num);
24        if(num==1)
25        {
26            printf("Enter the side of equilateral triangle : ");
27            scanf("%f",&t_side);
28            printf("The perimeter of triangle is : %f ",3*t_side);
29            printf("\nThe area of triangle is : %f ",(root3*t_side)/4);
30        }
31        if(num==2)
32        {
33            printf("Enter the same side of isosceles triangle : ");
34            scanf("%f",&sameside);
35            printf("Enter the base of isosceles triangle : ");
36            scanf("%f",&baseside);
37            printf("The perimeter of triangle is : %f ",(2*sameside)+baseside);
38            printf("\nThe area of triangle is : %f ",0.5*t_side*sqrt(((sameside*sameside)+(baseside*baseside))/4));
39        }
40        if(num==3)
41        {
42            printf("Enter the same sides of scalene triangle : ");
43            scanf("%f %f %f",&sameside,&t_side,&baseside);
44            double s=(sameside+t_side+baseside)/2;
45            double area = sqrt(s*(s-sameside)*(s-baseside)*(s-t_side));
46            printf("The perimeter of triangle is : %f ",baseside+sameside+t_side);
47            printf("\nThe area of triangle is : %f ",area);
48        }
49    }
50    if (shape=='s')
51    {
52        float s_side;
53        printf("Enter the side of square : ");
54        scanf("%f",&s_side);
55        printf("The perimeter of square is : %f",4*s_side);
56        printf("\nThe area of square is : %f",s_side*s_side);
57    }
58    if (shape=='r')
59    {
60        float r_side1,r_side2;
61        printf("Enter the sides of rectangle : ");
62        scanf("%f %f",&r_side1,&r_side2);
63    }
64 }

```

Build file: "no target" in "no project" (compiler: unknown) ==  
Build finished: 0 error(s), 0 warning(s) (0 minute(s), 1 second(s)) ==



```

34 printf("\nThe area of triangle is : %lf", 0.5*t_side*sqrt(((sameside*sameside)+(baseside*baseside))/4));
35 }
36 if (num==3)
37 {
38     printf("Enter the same sides of scalene triangle : ");
39     scanf("%lf %lf", &sameside, &t_side, &baseside);
40     double s=(sameside+t_side+baseside)/2;
41     double area = sqrt(s*(s-sameside)*(s-baseside)*(s-t_side));
42
43     printf("The perimeter of triangle is : %lf", baseside+sameside+t_side);
44     printf("\nThe area of triangle is : %lf", area);
45 }
46 if (shape=='s')
47 {
48     float s_side;
49     printf("Enter the side of square : ");
50     scanf("%f", &s_side);
51     printf("The perimeter of square is : %f", 4*s_side);
52     printf("\nThe area of square is : %f", s_side*s_side);
53 }
54 if (shape=='r')
55 {
56     float r_side1, r_side2;
57     printf("Enter the sides of rectangle : ");
58     scanf("%f %f", &r_side1, &r_side2);
59     printf("The perimeter of Rectangle is : %f", 2*(r_side1+r_side2));
60     printf("\nThe area of rectangle is : %f", (r_side1*r_side2));
61 }
62 }
63

```

Logs & others

Code::Blocks Search results Cccc Build log Build messages CppCheck/Vera++ CppCheck/Vera++ messages Cscope Debug

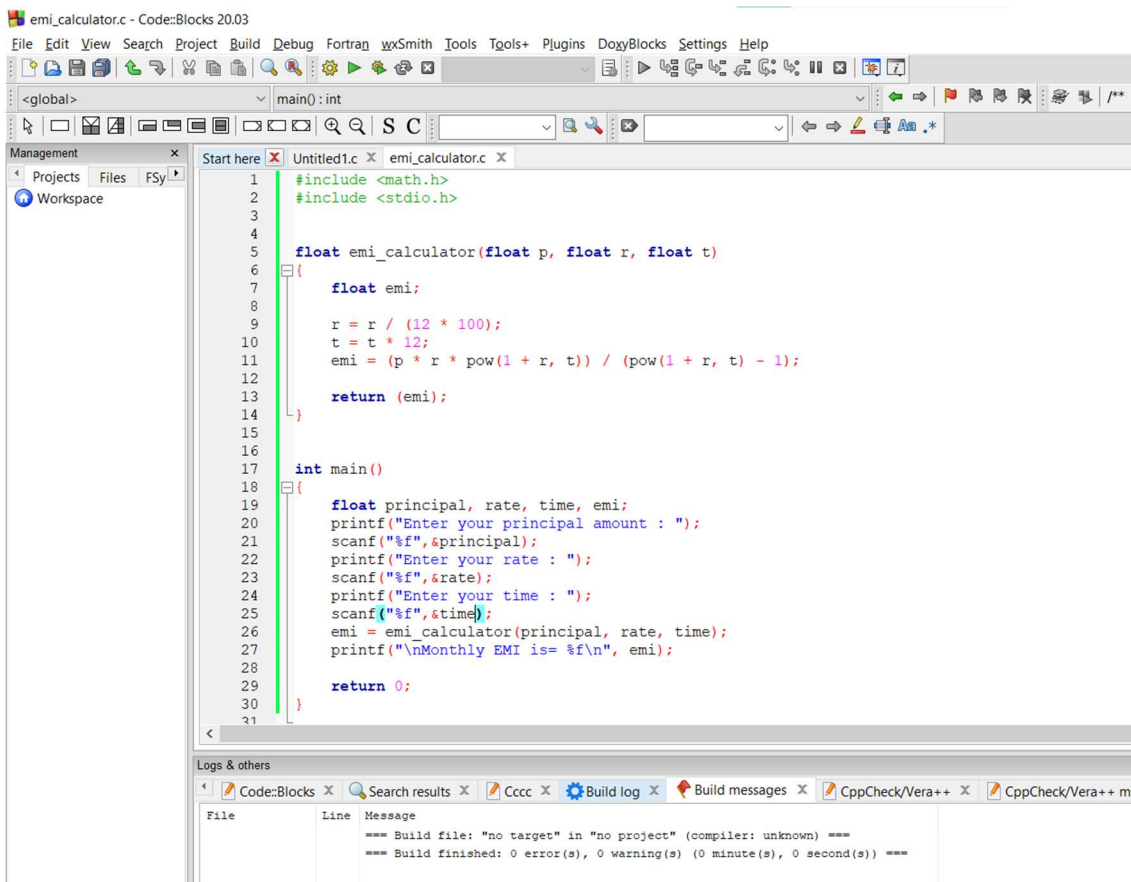
File Line Message

```

=== Build file: "no target" in "no project" (compiler: unknown) ===
=== Build finished: 0 error(s), 0 warning(s) (0 minute(s), 1 second(s)) ===

```

2)



```

1  #include <math.h>
2  #include <stdio.h>
3
4
5  float emi_calculator(float p, float r, float t)
6  {
7      float emi;
8
9      r = r / (12 * 100);
10     t = t * 12;
11     emi = (p * r * pow(1 + r, t)) / (pow(1 + r, t) - 1);
12
13     return (emi);
14 }
15
16
17 int main()
18 {
19     float principal, rate, time, emi;
20     printf("Enter your principal amount : ");
21     scanf("%f", &principal);
22     printf("Enter your rate : ");
23     scanf("%f", &rate);
24     printf("Enter your time : ");
25     scanf("%f", &time);
26     emi = emi_calculator(principal, rate, time);
27     printf("\nMonthly EMI is= %f\n", emi);
28
29     return 0;
30 }
31
  
```

Logs & others  
 Code::Blocks x Search results x Cccc x Build log x Build messages x CppCheck/Vera++ x CppCheck/Vera++ m

File	Line	Message
		=== Build file: "no target" in "no project" (compiler: unknown) ===
		=== Build finished: 0 error(s), 0 warning(s) (0 minute(s), 0 second(s)) ===

**Output(s):**

1)



```
C:\Users\kshre\OneDrive\Desktop\Shreejay\Untitled1.exe
Enter circle 'c' , triangle 't' , square 's' or rectangle 'r' : t
Enter '1' for equilateral triangle, '2' for isosceles triangle, '3' for scalene triangle : 3
Enter the same sides of scalene triangle : 3 4 5
The perimeter of triangle is : 12.000000
The area of triangle is : 6.000000
Process returned 0 (0x0)   execution time : 13.298 s
Press any key to continue.
```

```
C:\Users\kshre\OneDrive\Desktop\Shreejay\Untitled1.exe
Enter circle 'c' , triangle 't' , square 's' or rectangle 'r' : c
Enter the radius of circle : 40
The perimeter of circle is : 251.428571
The area of circle is : 5028.571429
Process returned 0 (0x0)   execution time : 7.489 s
Press any key to continue.
```

2)

```
C:\Users\kshre\OneDrive\Desktop\Shreejay\emi_calculator.exe
Enter your principal amount : 100000
Enter your rate : 8.45
Enter your time : 12
Monthly EMI is= 1107.278442
Process returned 0 (0x0)   execution time : 9.722 s
Press any key to continue.
```



## Conclusion:

The gcc compiler of c can be used to code with different data types which needs to be predefined , while taking input or output one needs to mention them .

## Post Lab Descriptive Questions

### 1. What are the basic data types in C?

**ANS)** Just like the name suggests, here, data types refer to the type of data that we are using in a C program. Whenever we utilise a data type in a C program, we define the variables or functions used in it. We do so because we must specify the type of data that is in use, so that the compiler knows exactly what type of data it must expect from the given program.

### 2. Write a table for Operator Precedence and Associativity.

()	Functional call	
[]	Array element reference	
->	Indirect member selection	Left to right
.	Direct member selection	
!	Logical negation	
~	Bitwise(1 's) complement	
+	Unary plus	
-	Unary minus	
++	Increment	
--	Decrement	Right to left
&	Dereference (Address)	
*	Pointer reference	
sizeof	Returns the size of an object	
(type)	Typecast (conversion)	
*	Multiply	
/	Divide	Left to right
%	Remainder	
+	Binary plus(Addition)	Left to right
-	Binary minus(subtraction)	

<<	Left shift	Left to right
>>	Right shift	
<	Less than	Left to right
<=	Less than or equal	
>	Greater than	
>=	Greater than or equal	
==	Equal to	Left to right
!=	Not equal to	
&	Bitwise AND	Left to right
^	Bitwise exclusive OR	Left to right
	Bitwise OR	Left to right
&&	Logical AND	Left to right
	Logical OR	Left to right
?:	Conditional Operator	Right to left
=	Simple assignment	Right to left
*=	Assign product	
/=	Assign quotient	
%=	Assign remainder	
+=	Assign sum	
-=	Assign difference	
&=	Assign bitwise AND	
^=	Assign bitwise XOR	
=	Assign bitwise OR	
<<=	Assign left shift	
>>=	Assign right shift	

**Date:** \_\_\_\_\_

**Signature of faculty in-charge**