**Batch: G3 Roll No.: 1601421063**

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

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

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

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| --- |
| **TITLE:** Write a program for:  a. Program to find area and circumference of various Geometric shapes.  b. 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:

a. Program to find area and circumference of various Geometric shapes.

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**Expected OUTCOME of Experiment:**

**CO 2**: Apply basic concepts of C programming for problem solving.

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**Books/ Journals/ Websites referred:**

1. Programming in ANSI C, E. Balagurusamy, 7 th Edition, 2016, McGraw-Hill Education, India.
2. Structured Programming Approach, Pradeep Dey and Manas Ghosh, 1 st Edition, 2016, Oxford University Press, India.
3. 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 user to enter the value of 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 principle 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:**

Problem-1: Calculating surface area and volume of cylinder.

Start

INPUT Radius and Height

Area=2\*3.141592\*radius\* (radius+height)

Volume=3.141592\*radius\*radius\*height

DISPLAY Area and Volume

STOP

Problem-2: Calculating EMI

START

INPUT Principal Rate and Time

Rate=Rate\*12/100

Time=Time\*12

EMI = (P.r.(1+r)n ) / ((1+r)n – 1)

DISPLAY EMI

STOP

**Implementation details:**

Problem-1:

#include<stdio.h>

int main()

{

float radius,height;

float PI=3.141592;

//getting radius and height

printf("Enter Radius of cylinder: ");

scanf("%4f",&radius);

printf("Enter Height: ");

scanf("%4f",&height);

//Calculating area and volume

float area=2\*PI\*radius\*(radius+height);

float volume=PI\*radius\*radius\*height;

//printing Area and Volume of cylinder

printf("Area Of cylinder is: %4f \n",area);

printf("Volume of cylinder is :%4f",volume);

return 0;

}

**Problem-2:**

#include <stdio.h>

#include <math.h>

int main()

{

//intialising variables

float principal, rate, time, emi;

//input

printf("Enter principal: ");

scanf("%f", &principal);

printf("Enter rate: ");

scanf("%f", &rate);

printf("Enter time in year: ");

scanf("%f", &time);

rate = rate / (12 \* 100); /\*one month interest\*/

time = time \* 12; /\*To change period from a year to a month\*/

//calculating EMI

emi = (principal \* rate \* pow(1 + rate, time)) / (pow(1 + rate, time) - 1);

printf("EMI = %f", emi);

return 0;

}

**Output(s):**

Problem-1:

Text

Description automatically generated with medium confidence

Problem-2:

Output for EMI calculator


**Conclusion:**

I learnt how to take input from the user and use the data to solve formula based problems. I did the experiment on EMI calculator and Cylinder Surface Area and Volume calculator. In this experiment I used “stdlib.h” and “math.h” header files to successfully solve the problem.

**Post Lab Descriptive Questions**

1. **Describe problem definition phase with one case study.**

**Ans.**

In Problem definition phase, we define the problem statement and we decide the boundaries of the problem. In this phase we need to understand the problem statement, what is our requirement, what should be the output of the problem solution. This also includes the exact format of the input as well as the output

**Example-**

When we want to make cake. We first determine the cake we want to make. Then we determine the ingredients required to make the cake. Then we decide which appliances to use such as oven, whisker, mixer or beater. This helps understand the whole program in detail with its requirements.

1. **What is a flowchart? What are the standard symbols used to draw a flow chart? Explain in brief.**

**Ans.**

A flowchart is **a picture of the separate steps of a process in sequential order**. It is a generic tool that can be adapted for a wide variety of purposes, and can be used to describe various processes, such as a manufacturing process, an administrative or service process, or a project plan. It helps us understand the exact order of the events which should take. Thus providing a much more organised approach.

1. OVAL- This is used to signify *START/END.*

END

START

The terminator symbol marks the starting or ending point of the system. It usually contains the word "Start" or "End."

1. BOX- This is used to signify a *PROCESS.*

This is used to denote a process in a program. It can also be used to show a subprocess in a larger program

1. DAIMOND- This is used to signify a *CONDITIONAL.*

This has usually three or branches 1 coming in and multiple going out depending on the condition

d)ARROWS-This is used to signify the flow of the flowchart

This usually connects various elements of the flowchart and helps the reader understand the direction of the program.

e) PARALLELOGRAM- This is used to signify INPUT/OUTPUT.

This component portrays input or output to the user.

**Date: \_\_\_\_27/10/2021\_\_ Signature of faculty in-charge**