Batch: P4(1) **Roll No.: 16010423076**

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

#Extra Code for IA and PA breakup mentioned below

Expected OUTCOME of Experiment:
1. Find area and circumference of various Geometric shapes
2. To calculate EMI

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.

Problem Definition:

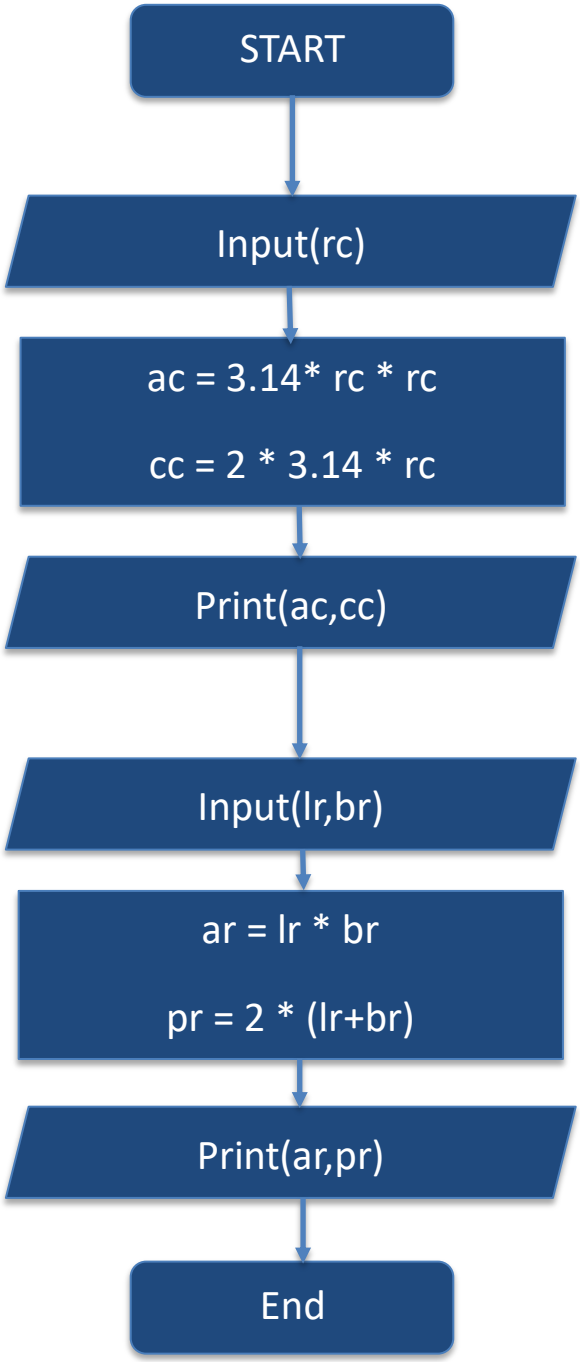
Problem 1: Area and Circumference of any shape(will be given by instructor) (example Circle)
Ask the user to enter the value of the radius of a circle. Put the values in the formula for finding area of a circle and circumference of a circle and print the outcome for area of a circle and circumference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

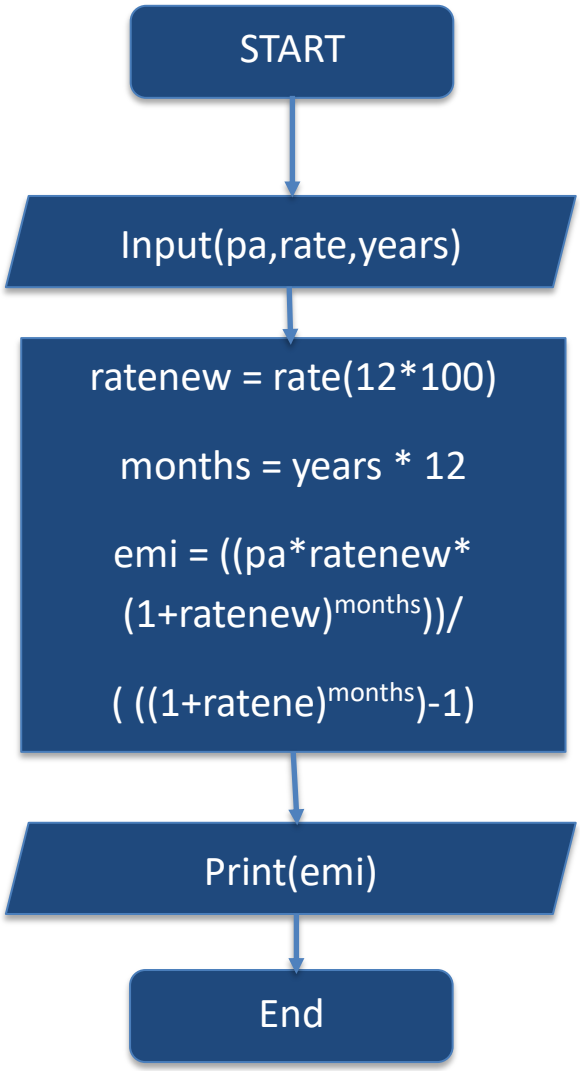
Formula to be used: $(E = (P.r.(1+r)^n) / ((1+r)^n - 1)$

Flowchart:

a)



b)



Implementation details:

a)

```
//Area of Shapes
#include<stdio.h>
void main(){

//Circle
```

```
float rc,ac,cc;
float lr,br,ar,pr;
printf("Enter the radius of circle =");
scanf("%f",&rc);
ac=(3.14*rc*rc);
cc=(2*3.14*rc);
printf("The area of the circle is =%f",ac);
printf("\nThe circumference of the circle is =%f",cc);

//Rectangle
printf("\n\nEnter the length of rectangle =");
scanf("%f",&lr);
printf("Enter the breadth of rectangle =");
scanf("%f",&br);
ar=lr*br;
pr=2*(lr+br);
printf("The area of the rectangle is =%f",ar);
printf("\nThe perimeter of the rectangle is =%f",pr);
}
```

b)

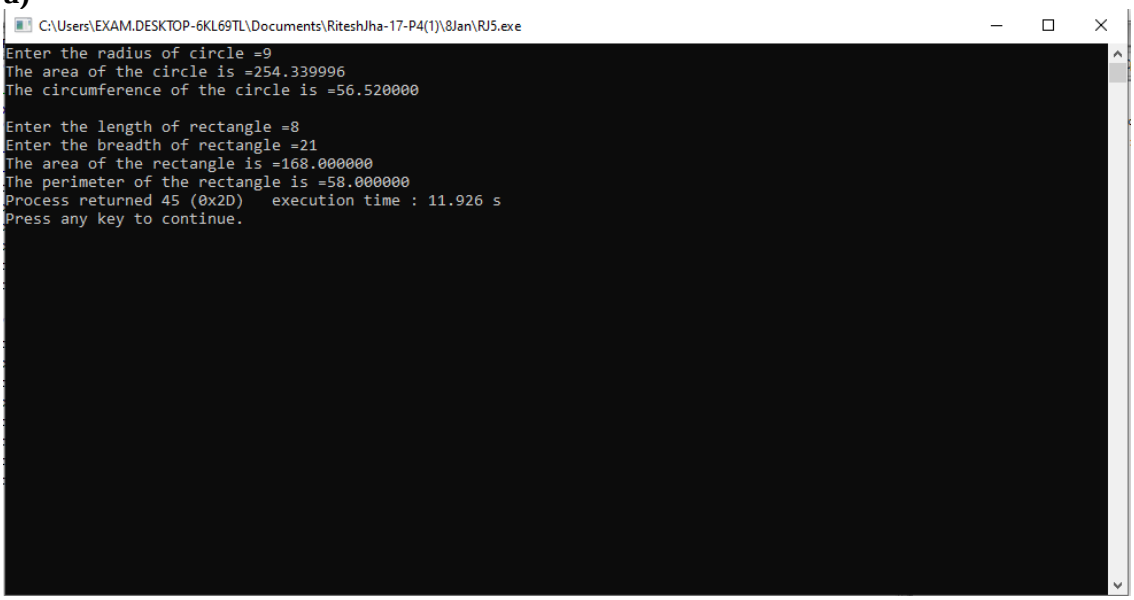
```
//EMI
#include<stdio.h>
void main(){
float pa,years,months,rate,ratenew,emi;
printf("Enter the Principal amount(in rupees) = ");
scanf("%f",&pa);
printf("Enter the Rate of interest(in percent) = ");
scanf("%f",&rate);
ratenew = rate/(12*100);   //Rate in factors
printf("Enter the Time(in years) = ");
scanf("%f",&years);
months = years*12; //Time in months

emi =((pa*ratenew*pow(1+ratenew,months))/(pow(1+ratenew,months)-1));
printf("The Equated monthly installment is =%f",emi);
}
```

Extra Question – To print the breakup of Interest amount and Principal amount from the EMI amount

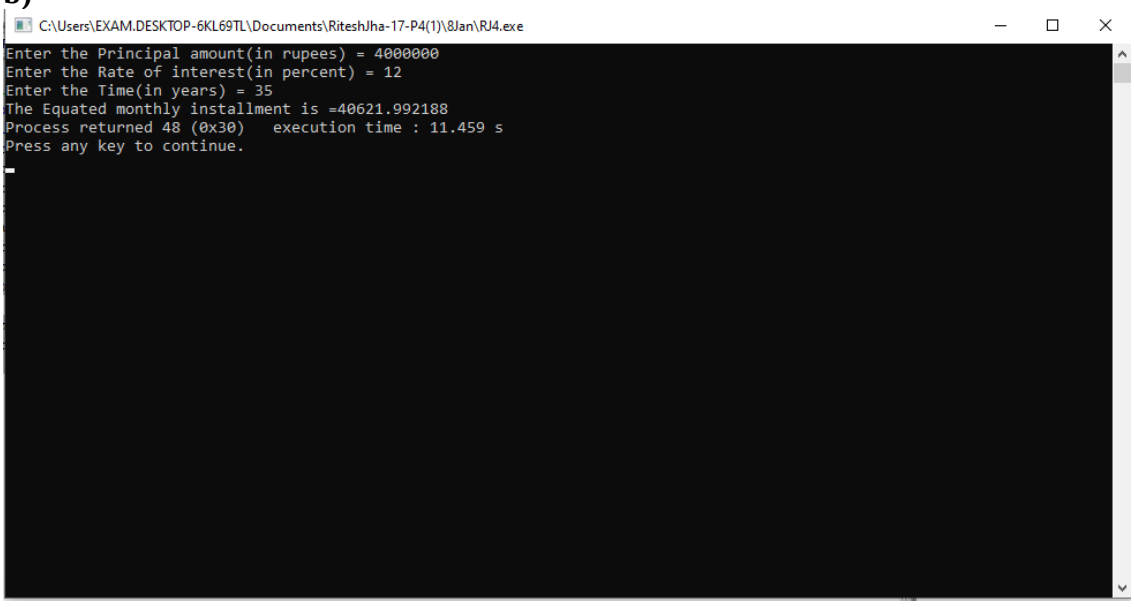
```
//EMI
#include<stdio.h>
void main(){
float pa,years,months,rate,ratenew,emi,ia,oa,i;
printf("Enter the Principal amount(in rupees) = ");
scanf("%f",&pa);
printf("Enter the Rate of interest(in percent) = ");
scanf("%f",&rate);
printf("Enter the Time(in years) = ");
scanf("%f",&years);
ratenew = rate/(12*100);   //Rate in factors
months = years*12; //Time in months

emi =((pa*ratenew*pow(1+ratenew,months))/(pow(1+ratenew,months)-1));
printf("\nThe Equated monthly installment is =%f",emi);

oa = pa;    //outstanding amt equals principal amt for 1st IA & PA
for(i = 1;i<=months;i++){
   ia = oa * ratenew;
   printf("\n\nThe ia is =%f",ia);
   pa = emi - ia;
   printf("\nThe pa is =%f",pa);
   oa -= pa;   //oa = oa - pa
   }
}
```

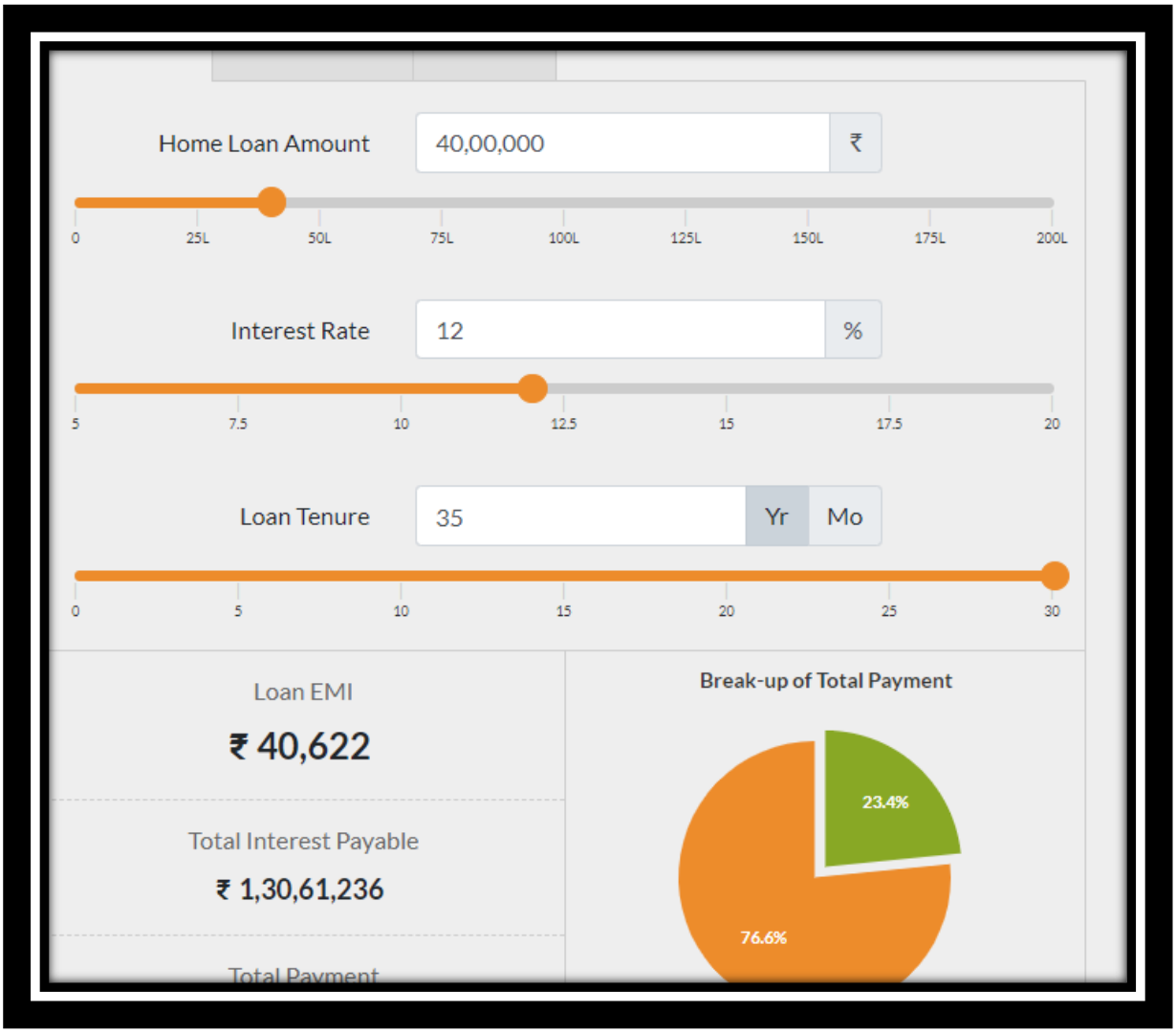
Output(s):

a)


C:\Users\EXAM.DESKTOP-6KL69TL\Documents\RiteshJha-17-P4(1)\8Jan\RJ5.exe
Enter the radius of circle =9
The area of the circle is =254.339996
The circumference of the circle is =56.520000
Enter the length of rectangle =8
Enter the breadth of rectangle =21
The area of the rectangle is =168.000000
The perimeter of the rectangle is =58.000000
Process returned 45 (0x2D)   execution time : 11.926 s
Press any key to continue.

b)


C:\Users\EXAM.DESKTOP-6KL69TL\Documents\RiteshJha-17-P4(1)\8Jan\RJ4.exe
Enter the Principal amount(in rupees) = 4000000
Enter the Rate of interest(in percent) = 12
Enter the Time(in years) = 35
The Equated monthly installment is =40621.992188
Process returned 48 (0x30)   execution time : 11.459 s
Press any key to continue.



#Extra Code OUTPUT

```
Enter the Principal amount(in rupees) = 500000
Enter the Rate of interest(in percent) = 12
Enter the Time(in years) = 10

The Equated monthly installment is =7173.550781

The ia is =5000.000000
The pa is =2173.550781

The ia is =4978.264160
The pa is =2195.286621

The ia is =4956.311523
The pa is =2217.239258

The ia is =4934.139160
The pa is =2239.411621

The ia is =4911.745117
The pa is =2261.805664

The ia is =4889.126953
The pa is =2284.423828

The ia is =4866.282227
The pa is =2307.268555

The ia is =4843.209473
The pa is =2330.341309
```

.
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```
The ia is =614.478333
The pa is =6559.072266

The ia is =548.887634
The pa is =6624.663086

The ia is =482.640991
The pa is =6690.909668

The ia is =415.731903
The pa is =6757.818848

The ia is =348.153717
The pa is =6825.396973

The ia is =279.899750
The pa is =6893.650879

The ia is =210.963242
The pa is =6962.587402

The ia is =141.337357
The pa is =7032.213379

The ia is =71.015228
The pa is =7102.535645
```

Conclusion:
Through calculating the area and circumference of geometric shapes and implementing the EMI formula for loans, I've gained practical experience in user input, variable manipulation and problem-solving.
These exercises underscore the importance of C programming in addressing mathematical and financial computations.

Post Lab Descriptive Questions

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

int: Integer type.
float: Floating-point type (decimal numbers).
char: Character type
double: Double-precision floating-point type (more decimal places).
void: Represents absence of type.

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

Operator	Precedence	Associativity
() [ ] -> . ++ --	**1**	Left to Right
+ - ! ~ ++ -- (type) sizeof	**2**	Right to Left
* / %	**3**	Left to Right
+ -	**4**	Left to Right
<< >>	**5**	Left to Right
< <= > >=	**6**	Left to Right
== !=	**7**	Left to Right
&	**8**	Left to Right
^	**9**	Left to Right
|	**10**	Left to Right

Date: _____ **Signature of faculty in-charge**