

WeekNo	PPA	PROGRAM
3	3.1	Sum of first n natural numbers
	3.2	Simple Interest
	3.3	Volume of sphere
	3.4	sum of the first n odd numbers
	3.5	Swap the value of a and b without using a temporary variable
	3.6	EMI Calculation
	3.7	volume of a cylinder

PPA 3 - Program 3.1

AIM : Complete the program to calculate the sum of the first n natural numbers. You are given an integer n . Calculate the sum of the first n natural numbers and store the result in the integer variable *sum*..

PROGRAM :

```
#include <stdio.h>
int main() {
    int n;
    scanf("%d", &n);
    // Write solution code below
    int sum;
    sum=n*(n+1)/2;
    printf("%d",sum);
    return 0;
}
```

OUTPUT:

Sample Input1

5

Output

15

Sample Input2

10

Output

55

Sample Input3

8

Output

36

Sample Input4

20

Output

210

Sample Input4

200

Output

20100

PPA 3- Program 3.2

AIM : You are given *principal*, *rate*, and *time* as double value. Calculate the simple interest and store the result in the double variable *simpleInterest*.

$$\text{simpleInterest} = \frac{\text{principal} * \text{rate} * \text{time}}{100}$$

Complete the program as per the given problem statement.

Sample Input

1000 5 10

Output

500.00

PROGRAM:

```
#include <stdio.h>
#include <math.h>
int main() {
    double principal, rate, time;
    scanf("%lf%lf%lf", &principal,&rate,&time);
    // Write solution code below
    double simpleInterest;
    simpleInterest=(principal*rate*time)/100;
    printf("%.2lf", simpleInterest);
    return 0;
}
```

OUTPUT:

Sample Input

1000 5 10

Output

500.00

Sample Input

1000 7.5 10

Output

750.00

Sample Input

5000 5 5

Output
1250.00

Sample Input
5000 8 1
Output
400.00

Sample Input
10000 6 2
Output
1200.00

PPA 3- Program 3.3

PROGRAM 1

AIM : Complete the program to calculate the volume of a sphere. You are given radius as the double value represents the radius of the sphere. Calculate the volume of a sphere and store the result in the double variable volume.

$$volume = \frac{4}{3} * \pi * radius^3$$

Note:- For consistency in the output, use $\pi = 3.14$.

PROGRAM

```
// Prefix Code
#include <stdio.h>
int main() {
    double radius;
    scanf("%lf", &radius);
    // Write solution code below
    double volume;
    volume=4.0/3.0*3.14*radius*radius*radius;
    printf("%.2lf", volume);
    return 0;
}
```

OUTPUT :

Sample Input
5
Output
523.33

Sample Input

6

Output

904.32

Sample Input

10

Output

4186.67

Sample Input

7

Output

1436.03

Sample Input

5.5

Output

696.56

PPA 3- Program 3.4

PROGRAM 1

AIM : Write a C program to calculate the sum of the first n odd numbers. The program must take an integer input from the user in a variable n, and calculate the sum of the first n odd numbers. The program must also print the integer output as shown below.

PROGRAM :

```
#include<stdio.h>
int main(){
    int n,sum;
    scanf("%d",&n);
    sum=n*n;
    printf("%d",sum);
    return 0;
}
```

OUTPUT :**Sample Input1**

5

Output

25

Sample Input2

10

Output

100

Sample Input3

3

Output

9

Sample Input4

7

Output

49

Sample Input5

8

Output

64

PPA 3- Program 3.5

PROGRAM 1

AIM : Complete the program to swap the value of a and b. You are given two integers a and b. Swap the value of a and b without using a temporary variable.

PROGRAM :

```
#include <stdio.h>
int main() {
    int a,b;
    scanf("%d%d", &a,&b);
    // Write solution code below
```

```
    a=a+b;
    b=a-b;
    a=a-b;
    printf("%d %d",a,b);
    return 0;
}
```

OUTPUT :

Sample Input1

2 3

Output

3 2

Sample Input2

5 10

Output

10 5

Sample Input3

100 5

Output

5 100

Sample Input4

5 5

Output

5 5

Sample Input5

11 22

Output

22 11

PPA 3- Program 3.6

PROGRAM 1

AIM : You are developing a program for a finance company that needs to calculate the monthly payment on a loan. Complete the given C program that takes the principal amount, annual interest rate in percentage, and the number of months to repay the loan as inputs and print the monthly payment(EMI) using the following formula:

$$\text{Monthly Payment} = \frac{P * r(1 + r)^n}{(1 + r)^n - 1}$$

Where:

P is the principal loan amount.

R is the annual interest rate in percentage.

$r = R/(12 * 100)$

n is the number of monthly payments.

Input Format

First line - the principal amount as double value

Second line - annual interest rate in percentage as double value

Third line - number of months to repay the loan as integer value

Output Format

Monthly payment as integer (round off integer value)

Note:- For consistency in the output, use double data type for variable to store decimal value

PROGRAM :

```
//Prefix Code(Visible)
#include <stdio.h>
#include <math.h>
int main()
{
    //Initialization of variables
    double principal, annual Rate, monthlyRate, monthlyPayment;
    int numMonths;

    //Reading Inputs
    scanf("%lf", &principal);
    scanf("%lf", &annual Rate);
    scanf("%d", &numMonths);
    // Write code below to calculate the monthly payment and store the result in
monthlyPayment variable
monthlyRate=annualRate/(12*100);
monthlyPayment=(principal*monthlyRate*pow(1+monthlyRate,numMonths))/(
pow(1+monthlyRate,numMonths)-1);
    //Printing the output
    printf("%.0lf", monthlyPayment);
    return 0;
}
```

OUTPUT :

Sample Input1
100000.00
8.50
36

Output
3157

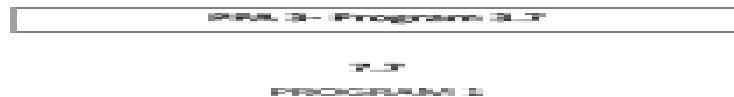
Sample Input2
10000.00
7.00
24

Output
448

Sample Input3
1000.00
8.50
12

Output
87

Sample Input4
500000.00
10.00
24
Output
23072



AIM : You are developing a program for a geometry calculator. Write a C program that calculates the volume of a cylinder based on its radius and height in inches. The program should take the radius and height as inputs and calculate the volume using the formula:

$$\text{Volume} = \pi * \text{Radius}^2 * \text{Height}$$

Note:- For consistency in output, use $\pi=3.14$ in solution code and use double data type for variable to store decimal value.

Input Format

First line - the radius as double value
Second line - the height as double value

Output Format

The volume of a cylinder as double value up to two decimal point.

Sample Input
15.60
72.80

Output
55630.15

Note: Use the following Template code to write solution code and complete the code as per comment.

PROGRAM :

```
#include<stdio.h>
int main()
```

```
{  
    double radius,height,volume;  
    scanf("%lf",&radius);  
    scanf("%lf",&height);  
    volume=3.14*radius*radius*height;  
    printf("%.2lf",volume);  
    return 0;  
}
```

OUTPUT :

Sample Input1

15.60

72.80

Output

55630.15

Sample Input2

10.00

30.00

Output

9420.00

Sample Input3

8.00

25.00

Output

5024.00

Sample Input4

15.53

40.12

Output

30383.20