MORE PROGRAMS IN C AND ASSIGNMENT 1

1.

```c
/*
 * C program to find diameter, circumference and area of a circle using functions
 */

#include <stdio.h>

#include <stdlib.h>

#include <math.h> // Used for constant PI referred as M_PI


/* Function declaration */
double getDiameter(double radius);
double getCircumference(double radius);
double getArea(double radius);


int main()
{
    float radius, dia, circ, area;

    /* Input radius of circle from user */
    printf("Enter radius of circle: ");
    scanf("%f", &radius);

    dia  = getDiameter(radius);       // Call getDiameter function
    circ = getCircumference(radius);  // Call getCircumference function
    area = getArea(radius);           // Call getArea function

    printf("Diameter of the circle = %.2f units\n", dia);
    printf("Circumference of the circle = %.2f units\n", circ);
    printf("Area of the circle = %.2f sq. units", area);

    return 0;
}


/**
 * Calculate diameter of circle whose radius is given
 */
double getDiameter(double radius)
{
    return (2 * radius);
}


/**
 * Calculate circumference of circle whose radius is given
 */
```

```
double getCircumference(double radius)
{
    return (2 * M_PI * radius); // M_PI = PI = 3.14 ...
}


/**
 * Find area of circle whose radius is given
 */
double getArea(double radius)
{
    return (M_PI * radius * radius); // M_PI = PI = 3.14 ...
}
```

2. SAME PROGRAM SOLVED WITHOUT USING USER DEFINED FUNCTIONS

```
/**
 * C program to calculate diameter, circumference and area of circle
 */

#include <stdio.h>
#include <stdlib.h>


int main()
{
    float radius, diameter, circumference, area;//LOCAL VARIABLE

    /*
     * Input radius of circle from user
     */
    printf("Enter radius of circle: ");
    scanf("%f", &radius);

    /*
     * Calculate diameter, circumference and area
     */
    diameter = 2 * radius;
    circumference = 2 * 3.14 * radius;
    area = 3.14 * (radius * radius);

    /*
     * Print all results
     */
    printf("Diameter of circle = %.2f units \n", diameter);
    printf("Circumference of circle = %.2f units \n", circumference);
    printf("Area of circle = %.2f sq. units ", area);

    return 0;
}
```

3.

```c
/**
 * C program to convert temperature from degree fahrenheit to celsius
 */

#include <stdio.h>
#include <stdlib.h>


int main()
{
    float celsius, fahrenheit;

    /* Input temperature in fahrenheit */
    printf("Enter temperature in Fahrenheit: ");
    scanf("%f", &fahrenheit);

    /* Fahrenheit to celsius conversion formula */
    celsius = (fahrenheit - 32) * 5 / 9;

    /* Print the value of celsius */
    printf("%.2f Fahrenheit = %.2f Celsius", fahrenheit, celsius);

    return 0;
}
```

4. Write a C program to input principle, time and rate (P, T, R) from user and find Simple Interest.

Simple interest formula is given by.

$$SI = \frac{P \times T \times R}{100}$$

Where,
`P` is the principle amount
`T` is the time and
`R` is the rate

```c
/**
 * C program to calculate simple interest
```

```
 */

#include <stdio.h>
#include <stdlib.h>


int main()
{
    float principle, time, rate, SI;

    /* Input principle, rate and time */
    printf("Enter principle (amount): ");
    scanf("%f", &principle);

    printf("Enter time: ");
    scanf("%f", &time);

    printf("Enter rate: ");
    scanf("%f", &rate);

    /* Calculate simple interest */
    SI = (principle * time * rate) / 100;

    /* Print the resultant value of SI */
    printf("Simple Interest = %f", SI);

    return 0;
}
```

5. Write a C program to input principle, time and rate (P, T, R) from user and find compound Interest.

compound interest formula is given by.

$$CI = P\left(1 + \frac{R}{100}\right)^{T}$$

Where,
P is principle amount
R is the rate and
T is the time span

```
/**
 * C program to calculate Compound Interest
```

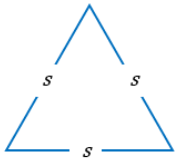
```
 */

#include <stdio.h>
#include <stdlib.h>

#include <math.h>

int main()
{
    float principle, rate, time, CI;

    /* Input principle, time and rate */
    printf("Enter principle (amount): ");
    scanf("%f", &principle);

    printf("Enter time: ");
    scanf("%f", &time);

    printf("Enter rate: ");
    scanf("%f", &rate);

    /* Calculate compound interest */
    CI = principle* (pow((1 + rate / 100), time));   // poW(BASE,EXPONENTIAL)

    /* Print the resultant CI */
    printf("Compound Interest = %f", CI);

    return 0;
}
```

NB: A program can be written using user defined function or without. If instructed to use user-defined functions one should follow that otherwise any method is appropriate

Assignment 1: (To submit in 2 weeks)

1.Write a C program to input marks of five subjects of a student and calculate total, average and percentage of all subjects. The program should make use of user defined functions

2. Write a C program to input side of an equilateral triangle from user and find area of the given triangle. Area of an equilateral triangle is given by:



$$A = \frac{\sqrt{3}}{4} s^2$$

3. Discuss the following concepts as used in computer programming.

1. Algorithms
2. Flowcharts
3. Pseudocodes

Where appropriate give detailed examples and illustrations