Assignment

1.
```
#include <stdio.h>

int main() {
   float originalPrice, taxRate, finalPrice;


   printf("Enter the original price of the product: $");
   scanf("%f", &originalPrice);

   printf("Enter the sales tax rate (in percentage): ");
   scanf("%f", &taxRate);


   finalPrice = originalPrice + (originalPrice * (taxRate / 100));


   printf("The final price of the product after adding %.2f%% sales tax is: $%.2f\n", taxRate,
finalPrice);

   return 0;
}
```

2.
```
#include <stdio.h>

int main() {
   float wagePerHour;
   int hoursWorked;


   printf("Enter the wage per hour: $");
   scanf("%f", &wagePerHour);

   printf("Enter the number of hours worked: ");
   scanf("%d", &hoursWorked);


   float weeklyWages;
   if (hoursWorked <= 30) {
      weeklyWages = wagePerHour * hoursWorked;
   } else {
      int regularHours = 30;
      int extraHours = hoursWorked - 30;
```

```
        weeklyWages = (wagePerHour * regularHours) + (wagePerHour * 2 * extraHours);
    }


    printf("Weekly wages: $%.2f\n", weeklyWages);

    return 0;
}
```

3.
```
#include <stdio.h>

int main() {
    int hourlyWage;
    int hoursWorked;


    printf("Enter the hourly wage: ");
    scanf("%d", &hourlyWage);
    printf("Enter the hours worked: ");
    scanf("%d", &hoursWorked);


    int weeklyWages;
    if (hoursWorked <= 30) {
        weeklyWages = hourlyWage * hoursWorked;
    } else {

        weeklyWages = hourlyWage * 30;


        weeklyWages += (hourlyWage * 2) * (hoursWorked - 30);
    }


    printf("Weekly wages: $%.2d\n", weeklyWages);

    return 0;
}
```

4.
```
#include <stdio.h>

int main() {
    float wages_per_hour, hours_worked, weekly_wages;


    printf("Enter the wages per hour: ");
```

```
    scanf("%f", &wages_per_hour);

    printf("Enter the number of hours worked: ");
    scanf("%f", &hours_worked);


    if (hours_worked <= 30) {
        weekly_wages = wages_per_hour * hours_worked;
    } else {

        weekly_wages = wages_per_hour * 30;


        float extra_hours = hours_worked - 30;
        float extra_wages = 2 * wages_per_hour * extra_hours;


        weekly_wages += extra_wages;
    }


    printf("Weekly wages: $%.2f\n", weekly_wages);

    return 0;
}
```

5.
```
#include <stdio.h>

int main() {
    int integer;
    char character;
    float floatValue;


    printf("Enter an integer: ");
    scanf("%d", &integer);


    printf("Enter a character: ");
    scanf(" %c", &character);


    printf("Enter a float value: ");
    scanf("%f", &floatValue);


    printf("You entered:\n");
```

```
    printf("Integer: %d\n", integer);
    printf("Character: %c\n", character);
    printf("Float Value: %.2f\n", floatValue);

    return 0;
}
```

6.
```
#include <stdio.h>

int main() {

    float cost = 172.53;


    printf("The sales total is: $ %.2f\n", cost);

    return 0;
}
```

7.
```
#include <stdio.h>

int main() {
    int apples_from_each = 6;
    float half_apple = 0.5;


    float total_apples = 3 * (apples_from_each + half_apple);


    printf("Raju has a total of %.1f apples.\n", total_apples);

    return 0;
}
```

8.
```
#include <stdio.h>

int main() {
    double floatValue = 12345.6789;

    printf("Value in exponential format: %.2e\n", floatValue);

    return 0;
}
```

9.
```
#include <stdio.h>
```

```
int main() {
    long long int mobileNumber;


    printf("Please enter your 10-digit mobile number: ");
    scanf("%lld", &mobileNumber);


    if (mobileNumber >= 1000000000LL && mobileNumber <= 9999999999LL) {

        printf("Your mobile number is: %lld\n", mobileNumber);
    } else {

        printf("Invalid input. Please enter a 10-digit mobile number.\n");
    }

    return 0;
}
```

10.
```
#include <stdio.h>

int main() {
    int initialPopulation = 30000;
    float increasePercentageFirstYear = 20.0;
    float increasePercentageSecondYear = 30.0;


    float populationAfterFirstYear = initialPopulation + (initialPopulation *
increasePercentageFirstYear / 100);


    float populationAfterSecondYear = populationAfterFirstYear + (populationAfterFirstYear *
increasePercentageSecondYear / 100);


    printf("Population after two years: %.0f\n", populationAfterSecondYear);

    return 0;
}
```

11.
```
#include <stdio.h>

int main() {
    char character;
```

```
    printf("Enter a character: ");
    scanf("%c", &character);


    int asciiValue = (int)character;


    printf("The ASCII value of '%c' is %d\n", character, asciiValue);

    return 0;
}
```

12.
```
#include <stdio.h>

int main() {
    float basicPay, hra, ta, salary;

    printf("Enter the basic pay: $");
    scanf("%f", &basicPay);

    hra = 0.15 * basicPay;
    ta = 0.20 * basicPay;

    salary = basicPay + hra + ta;

    printf("Basic Pay: $%.2f\n", basicPay);
    printf("HRA: $%.2f\n", hra);
    printf("TA: $%.2f\n", ta);
    printf("Total Salary: $%.2f\n", salary);

    return 0;
}
```

13.
```
#include <stdio.h>

int main() {
    float basicPay, hra, ta, salary;


    printf("Enter the basic pay: $");
    scanf("%f", &basicPay);


    hra = 0.15 * basicPay;
    ta = 0.20 * basicPay;
```

```
    salary = basicPay + hra + ta;


    printf("Basic Pay: $%.2f\n", basicPay);
    printf("HRA: $%.2f\n", hra);
    printf("TA: $%.2f\n", ta);
    printf("Total Salary: $%.2f\n", salary);

    return 0;
}
```

14.
```
#include <stdio.h>

int main() {
    float basicPay, hra, ta, salary;

    printf("Enter the basic pay: $");
    scanf("%f", &basicPay);

    hra = 0.15 * basicPay;
    ta = 0.20 * basicPay;

    salary = basicPay + hra + ta;

    printf("Basic Pay: $%.2f\n", basicPay);
    printf("HRA: $%.2f\n", hra);
    printf("TA: $%.2f\n", ta);
    printf("Total Salary: $%.2f\n", salary);

    return 0;
}
```

15.
```
#include <stdio.h>

int main() {
    double wavelength, speed, frequency;

    printf("Enter the wavelength (λ) of the wave (in meters): ");
    scanf("%lf", &wavelength);

    printf("Enter the speed (c) of the wave (in meters/second): ");
    scanf("%lf", &speed);

    frequency = speed / wavelength;
```

```
    printf("The frequency (f) of the wave is %.2lf Hz\n", frequency);

    return 0;
}
```

16.
```
#include <stdio.h>
#include <math.h>

int main() {
    double u = 30.0;
    double a = 5.0;
    double s = 70.0;

    double v_squared = pow(u, 2) + 2 * a * s;
    double v = sqrt(v_squared);

    printf("The final velocity of the car is %.2lf m/s\n", v);

    return 0;
}
```

17.
```
#include <stdio.h>

int main() {
    // Given values
    float u = 0.0;
    float a = 4.0;
    float t = 3.0;


    float v = u + (a * t);

    float s = (u * t) + (0.5 * a * t * t);

    printf("Final velocity (v): %.2f m/s\n", v);
    printf("Distance traveled (s): %.2f meters\n", s);

    return 0;
}
```

18.
```
#include <stdio.h>

int main() {
    int rollNumber = YOUR_ROLL_NUMBER;

    int lastFourDigits = rollNumber % 10000;
```

```
    int sum = 0;


    while (lastFourDigits > 0) {
        int digit = lastFourDigits % 10;
        sum += digit;
        lastFourDigits /= 10;
    }

    printf("Sum of the last four digits of your roll number: %d\n", sum);

    return 0;
}
```

19.
```
#include <stdio.h>

int main() {

    int height_cm = 175;
    int weight_kg = 70;


    const double CM_TO_FEET = 0.0328084;
    const double KG_TO_POUNDS = 2.20462;


    int height_feet = height_cm * CM_TO_FEET;
    int weight_pounds = weight_kg * KG_TO_POUNDS;

    printf("Height: %d cm is equal to %d feet\n", height_cm, height_feet);
    printf("Weight: %d kg is equal to %d pounds\n", weight_kg, weight_pounds);

    return 0;
}
```

20.

a. char option;

b. int sum = 0;

c. float product = 1.0;

21.
```
#include <stdio.h>

int main() {
    int numbers[9];
```

```
    printf("Enter nine integers:\n");
    for (int i = 0; i < 9; i++) {
        scanf("%d", &numbers[i]);
    }


    printf("Numbers in groups of three:\n");
    for (int i = 0; i < 9; i++) {
        printf("%d", numbers[i]);
        if ((i + 1) % 3 == 0) {
            printf("\n");
        } else {
            printf(", ");
        }
    }

    return 0;
}
```

22. Header files in C programming are files that contain declarations, macros, and inline functions used by other source files. These files typically have a .h extension and are included at the beginning of a C source file using the #include preprocessor directive.

23. 56 70 38
24. GLA UNIVERSITY14
25. Library functions are pre-written functions in a programming language that provide commonly used operations and functionalities.
Type of Library function :-
- Printf
- Scanf
- <math.h>
- <string.h>

26. 29 35 1d

27. printf(“%d”,scanf(“%d%d”,&a,&b));

scanf(“%d%d”, &a,&b) – mean the input taken by the user in which “%d” mean the integer constant, and &a in which the variable we want to store. Printf() mean the data that the user input will be print in the output.

28. "C % FOR % PLACEMENT”

29. #include <stdio.h>

```
int main() {
```

```
    double distance;
    double time;
    double speed;

    printf("Enter the distance between GLA University and Delhi (in kilometers): ");
    scanf("%lf", &distance);

    time = 4.0; // You can modify this value if needed
    speed = distance / time;

    printf("The speed of the bus is %.2lf km/hour.\n", speed);

    return 0;
}
30. #include <stdio.h>

int main() {
    int satyamMarks = 50;
    int sumanMarks = 70;
    int shyamMarks = 80;
    int totalMarks;
    float averageMarks;

    totalMarks = satyamMarks + sumanMarks + shyamMarks;

    averageMarks = (float)totalMarks / 3; // Using (float) to ensure floating-point division
```

```
    printf("The average marks of Satyam, Suman, and Shyam is %.2f\n", averageMarks);

    return 0;
}
```

31.
```
#include <stdio.h>

int main() {
    double sauravMoney, sajalMoney, temp;



    printf("Enter the amount given to Saurav: ");
    scanf("%lf", &sauravMoney);

    printf("Enter the amount given to Sajal: ");
    scanf("%lf", &sajalMoney);



    temp = sauravMoney;
    sauravMoney = sajalMoney;
    sajalMoney = temp;



    printf("After rectifying the mistake:\n");
    printf("Amount given to Saurav: %.2lf\n", sauravMoney);
    printf("Amount given to Sajal: %.2lf\n", sajalMoney);

    return 0;
}
```

32.
```
#include <stdio.h>

int main() {
```

```
    int speed = 4;
    int timeInMinutes = 3;
    int timeInHours;
    int distance;



    timeInHours = timeInMinutes / 60;


    distance = speed * timeInHours;
    printf("The distance traveled is %d kilometers.\n", distance);
    return 0;
}
```

33. Yes, you can combine multiple escape sequences in a single line of program code in languages like C

34. Comments are explanatory notes or remarks added to a computer program's source code.
To insert comments we can use “//” for single line comment and “/* */” for the multiple lines.

35. scanf(“%d”,number);
The problem is that there is no & syntax for the input
Correct command is - scanf(“%d”, %number);

36. Yes

37. the valid variable names are INTEREST and thereisbookinmysoup, and the invalid variable names are gross-salary, salary of emp, and avg..

38.
```
#include <stdio.h>

int main() {
    int tankSize = 175;
    int drainageRate = 25;
    int hours = 0;

    while (tankSize > 0) {
        tankSize -= drainageRate;
```

```
        hours++;
    }

    printf("It will take %d hours to completely clean the tank.\n", hours);

    return 0;
}
```

39.
```
#include <stdio.h>

int main() {
    int batteryPower = 100; // Initial battery power at 100%
    int targetPower = 75; // Target power at 75%
    int hours = 0; // Number of hours

    while (batteryPower > targetPower) {
        batteryPower -= 20;
        hours++;
    }

    printf("It takes %d hours for the battery power to reach 75%%.\n", hours);

    return 0;
}
```

40. Compiler

41. %d

42. %.2e

43. array

44. "hello" 7

45. Garbage, 5

46. basic pay

47. c1

48. a) (101101101.100011)2

b) (705.51)8

c) 1434.1EB8)16

d) (43.31313..)5

e) (2152)7

49. a) 126.111

b)

c) 482.84

d) 18791.7

50. (1101101101010110.110011010100)2, (666536.3304)8, (311321.231100)4

51. (100111001.100010)2

315.75

(9CD.820)16

(22)5

(423.322)5

52. A = (-1 ± √105) / 2

53. -32766

54. Temperature in Fahrenheit is 41.00