Lab Assignment 1

Fall 2024

Course Title: Structured Programming Lab

Course Code: CSE 1202 (Fall 2024)

Submitted by:

Student Name and ID

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1. Write a C program to enter the radius of a circle and find its circumference and area. Note that Circumference = 2 x π x radius, Area = π x (radius) 2 , and assume π=3.1416

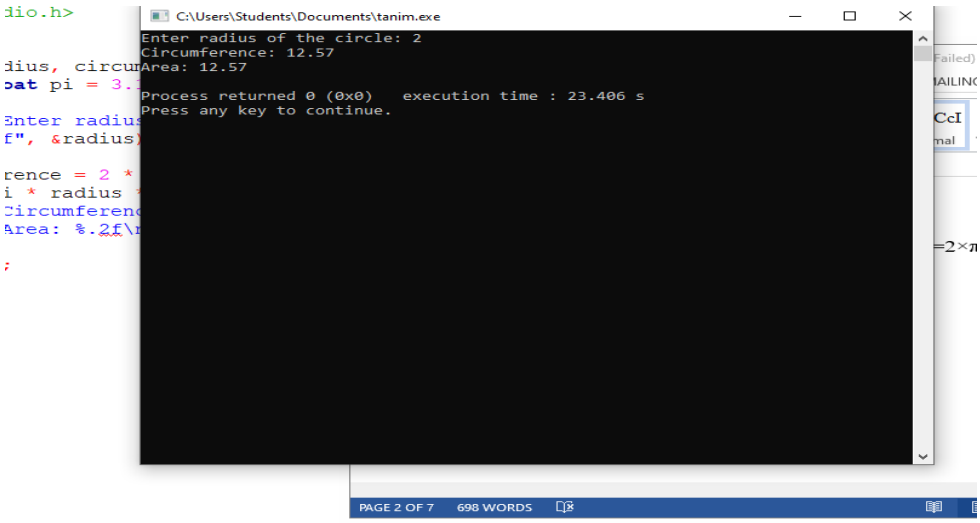
Answer:

Algorithm:

Steps to follow for the solution:
1. Input the radius of the circle.
2.Calculate circumference using the formula Circumference=2×π×radius
3.Calculate area using the formula Area= $\pi \times \text{radius}^2$
4. Display the circumference and area

Code

```
#include <stdio.h>

int main() {
    float radius, circumference, area;
    const float pi = 3.1416;

    printf("Enter radius of the circle: ");
    scanf("%f", &radius);

    circumference = 2 * pi * radius;
    area = pi * radius * radius;
    printf("Circumference: %.2f\n", circumference);
    printf("Area: %.2f\n", area);

    return 0;
}
```



2. Write a C program to calculate and display the total salary of an employee considering that total salary is the sum of basic salary and house rent. The program must ask the user for the basic salary and percentage of basic salary which determines the house rent.

Answer:

Algorithm:

Steps to follow for the solution:

a. Input the basic salary and percentage of basic salary for house rent.

b. Calculate house rent using the formula House Rent

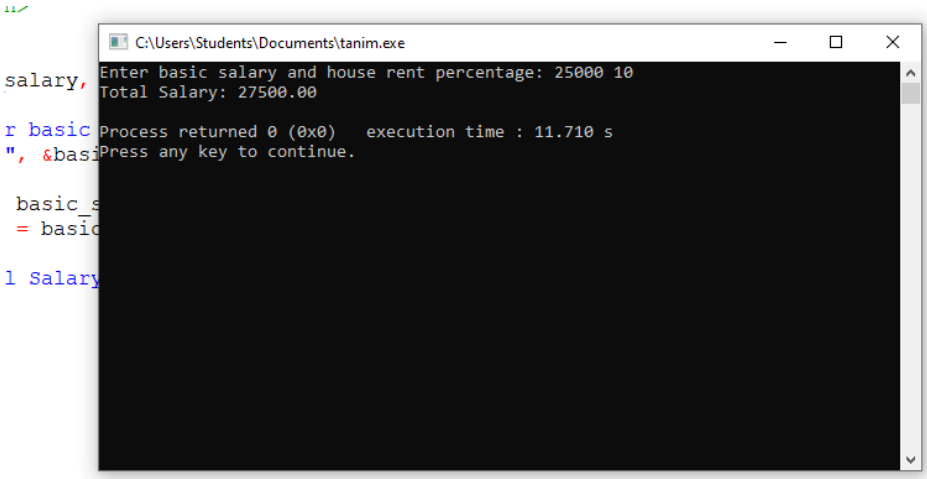
$$= Basic\ Salary \times \frac{percentage}{100}$$

c. Calculate total salary by adding basic salary and house rent.

d. Display the total salary.

Code

```
#include <stdio.h>

int main() {
    float basic_salary, percentage, house_rent, total_salary;

    printf("Enter basic salary and house rent percentage: ");
    scanf("%f %f", &basic_salary, &percentage);

    house_rent = basic_salary * (percentage / 100);
    total_salary = basic_salary + house_rent;

    printf("Total Salary: %.2f\n", total_salary);

    return 0;
}
```



3. Write a C program that takes number of days as input, and then converts it into years and days, and displays the results. Assume that, 1 year = 365 days.

Answer:

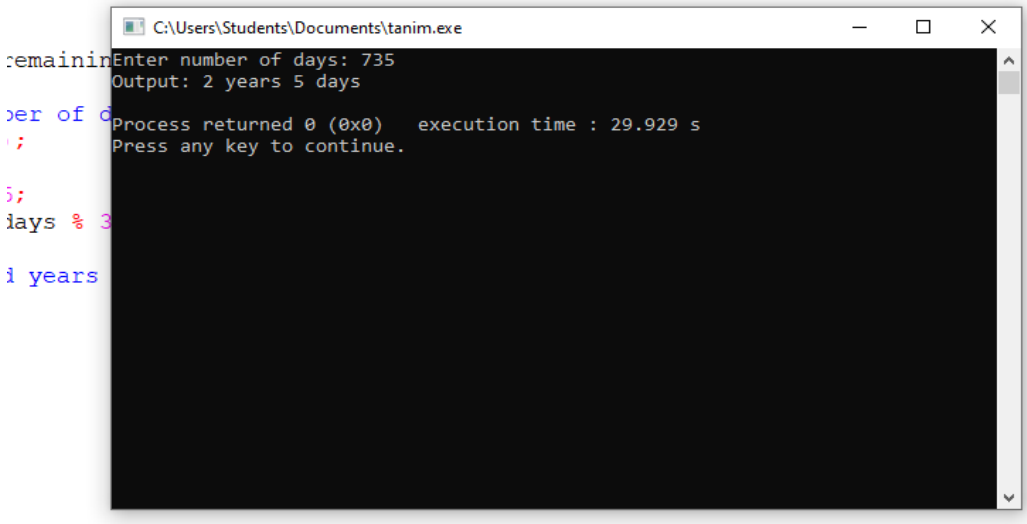
Algorithm:

Steps to follow for the solution:

a. Input the number of days.
b. Calculate years by dividing days by 365.
c. Calculate remaining days by using modulus operation.
d. Display years and remaining days.

Code

```
#include <stdio.h>

int main() {
    int days, years, remaining_days;

    printf("Enter number of days: ");
    scanf("%d", &days);

    years = days / 365;
    remaining_days = days % 365;

    printf("Output: %d years %d days\n", years, remaining_days);

    return 0;
}
```



4. Take two inputs from user and find out sum, subtract multiplication and division.

Answer:

Algorithm:

Steps to follow for the solution:

a. Input two numbers.

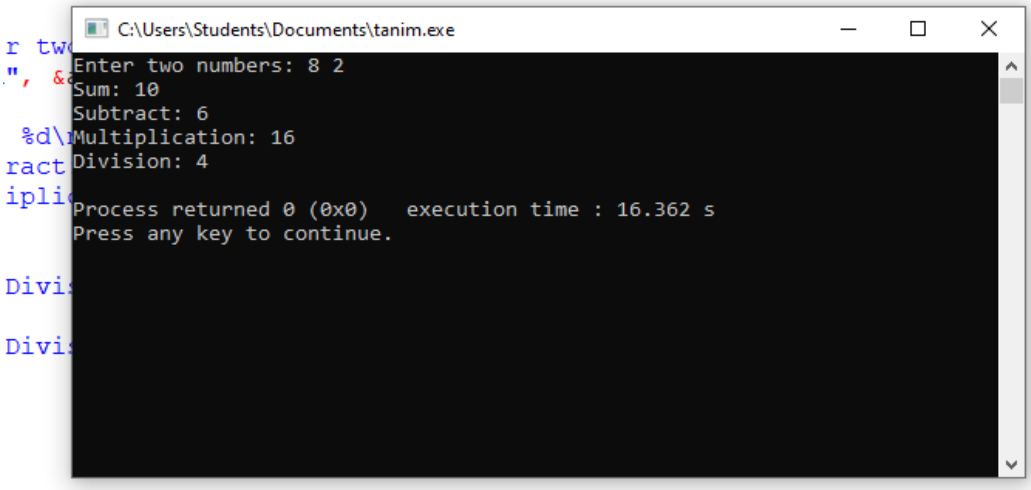
b.Calculate the sum, difference, product, and quotient of the two numbers.

c. If the second number is zero, display a message that division is not possible.

d. Display the results.

Code

```
#include <stdio.h>

int main() {
    int a, b;
    printf("Enter two numbers: ");
    scanf("%d %d", &a, &b);

    printf("Sum: %d\n", a + b);
    printf("Subtract: %d\n", a - b);
    printf("Multiplication: %d\n", a * b);

    if (b != 0)
        printf("Division: %d\n", a / b);
    else
        printf("Division: not possible to divide by 0\n");

    return 0;
}
```



5. Find out average of four numbers

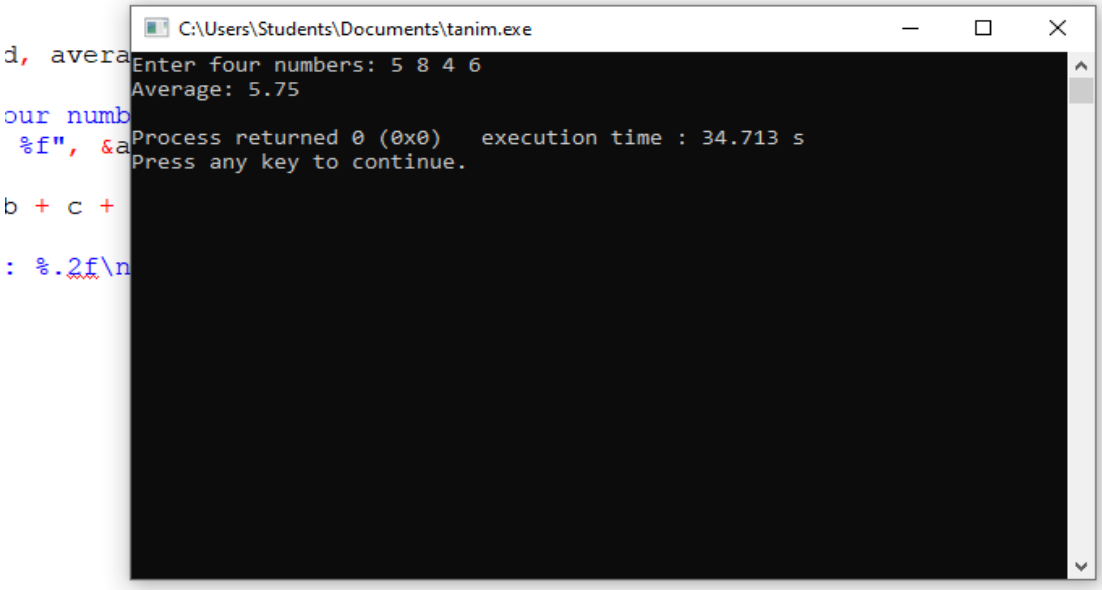
Answer:

Algorithm:

Steps to follow for the solution:
a. Input four numbers.
b. Calculate the sum of the four numbers.
c. Divide the sum by 4 to get the average.
d. Display the average.

Code

```
#include <stdio.h>

int main() {
    float a, b, c, d, average;

    printf("Enter four numbers: ");
    scanf("%f %f %f %f", &a, &b, &c, &d);

    average = (a + b + c + d) / 4;

    printf("Average: %.2f\n", average);

    return 0;
}
```



6. Convert Celsius temperature to Fahrenheit Algorithm:

Answer:
Algorithm:

Steps to follow for the solution:

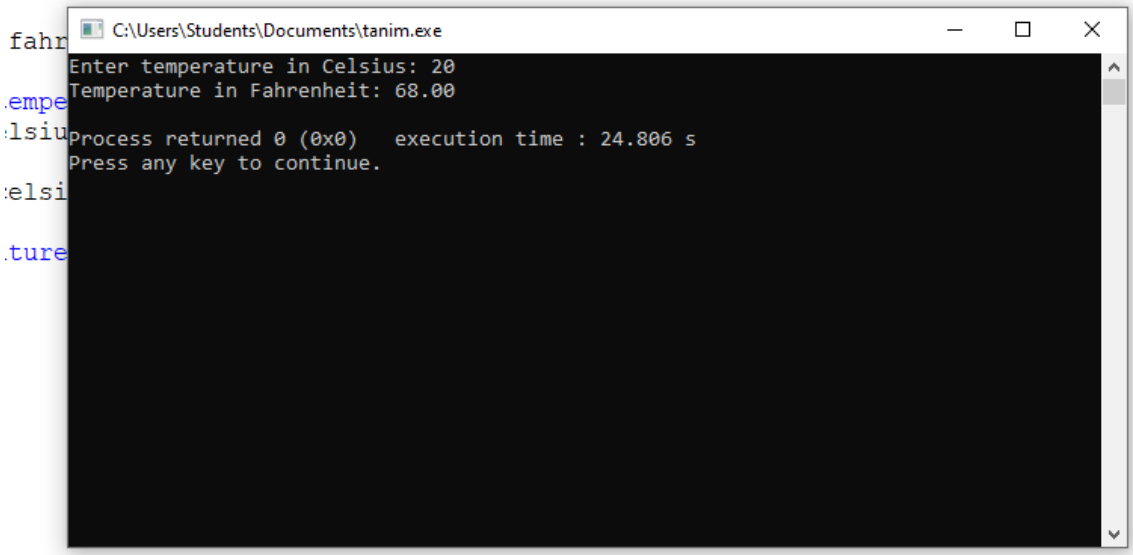
a. Input temperature in Celsius.

b. Convert to Fahrenheit using the formula $F = C \times \frac{9}{5} + 32$

c. Display the temperature in Fahrenheit.

Code

```
#include <stdio.h>

int main() {
    float celsius, fahrenheit;

    printf("Enter temperature in Celsius: ");
    scanf("%f", &celsius);

    fahrenheit = (celsius * 9 / 5) + 32;

    printf("Temperature in Fahrenheit: %.2f\n", fahrenheit);

    return 0;
}
```



Discussion :

The assignment encompasses various Structured programming assignments in C, emphasizing the basic building blocks such as user input, simple arithmetic operations, and condition handling. Geometry and salary computation, specifying constants and percent-based formulas. What stands out from this assignment, other than solving exercises, is the fact that it has concrete problems — for example, asking to convert days to years and days and Celsius to Fahrenheit, which makes it emphasize modularity and transformation using formulae. An example of a simple calculator program that illustrates basic arithmetic operations and even checks for division by zero and a program that calculates the average of several numbers that helps practice getting multiple inputs. These collectively lay a strong groundwork in structured programming, allowing ease into essential problem-solving heuristics for students later.