C Lab assignment (Ex1 & Ex2)

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# Exercise 1

## Question 1­­­­

### Question



### Code

// Anu’s basic salary is the input. Her dearness allowance is 20% of basic salary and house rent is 20% of basic salary. Write a program to calculate her gross salary.

#include <stdio.h>

int main()

{

    printf("Enter Anu's base salary: ");

    double base\_salary;

    scanf("%lf", &base\_salary);

    printf("\n");

    double da = base\_salary \* 0.2, hra = base\_salary \* 0.2; // 20% => 0.2

    printf("Dearness allowance: %lf\n", da);

    printf("House rental allowance: %lf\n", hra);

    double gross\_salary = base\_salary + da + hra;

    printf("Gross salary: %lf\n", gross\_salary);

}

### Output

Graphical user interface, text, Excel

Description automatically generated with medium confidence

## Question 2

### Question



### Code

// The distance between two cities (in km.) is the input. Write a program to convert and print the distance in meters, feet, inches and centimeters.

#include <stdio.h>

int main()

{

    double km;

    printf("Enter km: ");

    scanf("%lf", &km);

    printf("\n");

    printf("In meters: %lf\n", km \* 1000.0);

    printf("In feet: %lf\n", km \* 3280.84);

    printf("In inches: %lf\n", km \* 39370.1);

    printf("In centimeters: %lf\n", km \* 100000.0);

}

### Output

Text

Description automatically generated

## Question 3

### Question



### Code

// Temperature  of  city  in  Fahrenheit  degrees  is  the  input.  Write  a  program  to  convert  the temperature into centigrade degrees.

#include <stdio.h>

int main()

{

    double fahrenheit;

    printf("Enter temperature in fahrenheit: ");

    scanf("%lf", &fahrenheit);

    printf("Temperature in celsius: %lf", ((fahrenheit - 32.0) \* 5.0) / 9.0);

}

### Output

Graphical user interface, application, table, Excel

Description automatically generated

## Question 4

### Question

Text, letter

Description automatically generated

### Code

// The length and breadth of a rectangle and radius of a circle are the inputs. Write a program to calculate the area and perimeter of the rectangle and the area and circumference of the circle.

#include <stdio.h>

int main()

{

    double length, breadth, radius;

    printf("Enter the length and breadth of a rectangle and radius of a circle: \n");

    scanf("%lf", &length);

    scanf("%lf", &breadth);

    scanf("%lf", &radius);

    printf("Area of the rectangle: %lf\n", length \* breadth);

    printf("Area of the circle: %lf\n", radius \* radius \* 3.14159);

    printf("Perimeter of the rectangle: %lf\n", 2 \* length \* breadth);

    printf("Perimeter of the circle: %lf\n", radius \* 2 \* 3.14159);

}

### Output

A screenshot of a computer

Description automatically generated with medium confidence

## Question 5

### Question

Text

Description automatically generated

### Code

// Write a program to receive values of latitude(L1, L2) and longitude (G1, G2) in degrees, of two places on the earth and output the distance (D) between them in miles. The formula for distance in miles is:

// D = 3963 cos-1 (sin L1 sinL2+cos L1 cosL2\*cos(G2-G1))

#include <stdio.h>

#include <math.h>

int main()

{

    double L1, L2, G1, G2;

    printf("Enter L1, L2, G1, G2:\n");

    scanf("%lf%lf%lf%lf", &L1, &L2, &G1, &G2);

    double distance = 3963 \* acos((sin(L1) \* sin(L2)) + (cos(L1) \* cos(L2) \* cos(G2 - G1)));

    printf("Distance between the two points is %lf miles\n", distance);

}

### Output

Graphical user interface, text

Description automatically generated

## Question 6

### Question

Text

Description automatically generated

### Code

// Wind chill factor is the felt air temperature on exposed skin due to wind.  The wind chill temperature  is  always  lower  than  the  air  temperature  and  is  calculated  the  following formula: wcf = 35.74+0.6215t + (0.4275t – 35.75) \* v0.16 Where t is the temperature and v is the wind velocity. Write a program to receive values of t and v and calculate wind chill factor.

// wcf = 35.74+0.6215t + (0.4275t – 35.75) \* v0.16

#include <stdio.h>

#include <math.h>

int main()

{

    double temperature, wind\_velocity;

    printf("Enter temperature: ");

    scanf("%lf", &temperature);

    printf("Enter wind velocity: ");

    scanf("%lf", &wind\_velocity);

    double wind\_chill\_factor = 35.74 + 0.6215 \* temperature + (0.4275 \* temperature - 35.75) \* pow(wind\_velocity, 0.16);

    printf("The wind chill factor is: %lf\n", wind\_chill\_factor);

}

### Output

Graphical user interface, text, Excel

Description automatically generated

# Exercise 2

## Question 1

### Question



### Code

#include <stdio.h>

int main()

{

    int arr[3];

    printf("Enter 3 sides of the triangle:\n");

    scanf("%d%d%d", &arr[0], &arr[1], &arr[2]);

    // Finding the largest side

    int largest = 0;

    for (int i = 0; i < 3; i++)

    {

        if (arr[i] > arr[largest])

        {

            largest = i;

        }

    }

    // Summing the other 2 sides of the triangle

    int sum = 0;

    for (int i = 0; i < 3; i++)

    {

        if (i != largest)

        {

            sum += arr[i];

        }

    }

    // Checking sum vs largest side

    if (sum > arr[largest])

    {

        printf("Triangle is valid\n");

    }

    else

    {

        printf("Triangle is not valid\n");

    }

}

### Output

A screenshot of a computer

Description automatically generated with medium confidence

## Question 2

### Question



### Code

// Write a program to receive value of an angle in degrees and check whether sum of squares of sin and cosine of this angle is equal to 1.

#include <stdio.h>

#include <math.h>

int main()

{

    double degrees;

    printf("Enter angle in degrees");

    scanf("%lf", &degrees);

    // Convert degrees to radians

    double radians = (degrees \* M\_PI) / 180.0;

    double sine\_value = sin(radians) \* sin(radians);

    double cosine\_value = cos(radians) \* cos(radians);

    printf("sine\_value = %lf\n", sine\_value);

    printf("cosine\_value = %lf\n", cosine\_value);

    printf("Total value = %lf\n", sine\_value + cosine\_value);

    if (sine\_value + cosine\_value == 1.0)

    {

        printf("Therefore sin^2 x + cos^2 x = 1 is proven.");

    }

}

### Output

Graphical user interface, text, application

Description automatically generated

## Question 3

### Question

Table

Description automatically generated

### Code

// Write a program that receives weight as input and prints out the boxer’s weight class. In boxing the weight class of a boxer is decided as per the following table.

#include <stdio.h>

int main()

{

    printf("Enter boxer's weight: ");

    double weight;

    scanf("%lf", &weight);

    if (weight < 115)

    {

        printf("Fly weight\n");

    }

    else if (weight <= 121)

    {

        printf("Bantam weight\n");

    }

    else if (weight <= 153)

    {

        printf("Feather weight\n");

    }

    else if (weight <= 189)

    {

        printf("Middle weight\n");

    }

    else

    {

        printf("Heavy weight\n");

    }

}

### Output

A screenshot of a computer

Description automatically generated with medium confidence

## Question 4

### Question

Table

Description automatically generated

### Code

// Write a program that accepts month and date of birth as input and prints the corresponding zodiac sign based on the following table:

#include <stdio.h>

int main()

{

    int date, month;

    printf("Enter month (1-12): ");

    scanf("%d", &month);

    // months with 31 days

    if (month == 1 || month == 3 || month == 5 || month == 7 || month == 8 || month == 10 || month == 12)

    {

        printf("Enter date (1-31):");

    }

    else if (month == 2)

    {

        printf("Enter date (1-29):");

    }

    else

    {

        printf("Enter date (1-30):");

    }

    scanf("%d", &date);

    switch (month)

    {

    case 1:

        if (date <= 19)

        {

            printf("Capricorn");

        }

        else

        {

            printf("Aquarius");

        }

        break;

    case 2:

        if (date <= 17)

        {

            printf("Aquarius");

        }

        else

        {

            printf("Pisces");

        }

        break;

    case 3:

        if (date <= 19)

        {

            printf("Pisces");

        }

        else

        {

            printf("Aries");

        }

        break;

    case 4:

        if (date <= 20)

        {

            printf("Aries");

        }

        else

        {

            printf("Taurus");

        }

        break;

    case 5:

        if (date <= 20)

        {

            printf("Taurus");

        }

        else

        {

            printf("Gemini");

        }

        break;

    case 6:

        if (date <= 20)

        {

            printf("Gemini");

        }

        else

        {

            printf("Cancer");

        }

        break;

    case 7:

        if (date <= 22)

        {

            printf("Cancer");

        }

        else

        {

            printf("Leo");

        }

        break;

    case 8:

        if (date <= 22)

        {

            printf("Leo");

        }

        else

        {

            printf("Virgo");

        }

        break;

    case 9:

        if (date <= 22)

        {

            printf("Virgo");

        }

        else

        {

            printf("Libra");

        }

        break;

    case 10:

        if (date <= 22)

        {

            printf("Libra");

        }

        else

        {

            printf("Scorpio");

        }

        break;

    case 11:

        if (date <= 21)

        {

            printf("Scorpio");

        }

        else

        {

            printf("Saggitarius");

        }

        break;

    case 12:

        if (date <= 21)

        {

            printf("Saggitarius");

        }

        else

        {

            printf("Capricorn");

        }

        break;

    default:

        printf("Invalid month");

    }

    printf("\n");

}

### Output

Background pattern

Description automatically generated

A screenshot of a computer

Description automatically generated

## Question 5

### Question



### Code

// Write a program to read ten numbers and count number of positive, negative and zero.

#include <stdio.h>

int main()

{

    int number;

    int positive = 0, negative = 0, zero = 0;

    for (int i = 0; i < 10; i++)

    {

        scanf("%d", &number);

        if (number < 0)

        {

            negative++;

        }

        else if (number > 0)

        {

            positive++;

        }

        else

        {

            zero++;

        }

    }

    printf("Number of positives: %d\n", positive);

    printf("Number of negatives: %d\n", negative);

    printf("Number of zeroes: %d\n", zero);

}

### Output

A screenshot of a computer

Description automatically generated with medium confidence

## Question 6

### Question

Text

Description automatically generated with low confidence

### Code

#include <stdio.h>

#include <math.h>

int main()

{

    // User input

    int n;

    printf("Enter value of n:");

    scanf("%d", &n);

    // i) 1+3+5+7+...n

    int i, sum = 0;

    for (i = 1; i <= n; i += 2)

    {

        sum += i;

    }

    printf("1+3+5+7+...n: %d\n", sum);

    // 1+4+25+36....n

    sum = 0;

    i = 1;

    while (pow(i, 2) <= n)

    {

        sum += (int)pow(i, 2);

        i++;

        if (pow(i, 2) <= n)

        {

            sum += (int)pow(i, 2);

            i++;

        }

        i += 2;

    }

    printf("1+4+25+36....n: %d\n", sum);

    // x+x^2/2! +x^3/3!+.....+x^n/n!

    double sumd = 0;

    i = 1;

    printf("Enter value of x: ");

    int x;

    scanf("%d", &x);

    while (i <= n)

    {

        int key = i, j = 1;

        double fact = 1.0;

        do

        {

            fact \*= (double)j;

            j++;

        } while (j <= key);

        sumd += pow(x, i) / fact;

        i++;

    }

    printf("x+x^2/2! +x^3/3!+.....+x^n/n!: %lf", sumd);

}

### Output

Graphical user interface, text, Excel

Description automatically generated