**A Micro Project Report**

**on**

**Problem Solving using C Language**

Submitted by

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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**NARASARAOPETA ENGINEERING COLLEGE: NARASARAOPET (AUTONOMOUS)**

**Accredited by NAAC with A+ Grade and NBA under Tier-1**

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**2024-20****25**

**NARASARAOPETA ENGINEERING COLLEGE: NARASARAOPET**

**(AUTONOMOUS)**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**



**CERTIFICATE**

**This is to certify that MALAPATI SOWJANYA Roll No: 23471A05HV, a Second Year Student of the Department of Computer Science and Engineering, has completed the Micro Project Satisfactorily in “Problem Solving using C Language" for the Academic Year 2024-2025.**.

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| **S.No** | **Description** |
|  | Develop a project on addition, subtraction and multiplication polynomial equations |

polynomial equations

**AIM**:

**Write a C program taddition subtraction and multiplication of two polynomial equations**

C Code for Polynomial Operations:

#include <stdio.h>

#include <stdlib.h>

// Function to add two polynomials

void addPolynomials(int \*poly1, int \*poly2, int \*result, int size1, int size2) {

int i;

for (i = 0; i < size1 || i < size2; i++) {

if (i < size1)

result[i] += poly1[i];

if (i < size2)

result[i] += poly2[i];

}

}

// Function to subtract two polynomials

void subtractPolynomials(int \*poly1, int \*poly2, int \*result, int size1, int size2) {

int i;

for (i = 0; i < size1 || i < size2; i++) {

if (i < size1)

result[i] += poly1[i];

if (i < size2)

result[i] -= poly2[i];

}

}

// Function to multiply two polynomials

void multiplyPolynomials(int \*poly1, int \*poly2, int \*result, int size1, int size2) {

int i, j;

for (i = 0; i < size1; i++) {

for (j = 0; j < size2; j++) {

result[i + j] += poly1[i] \* poly2[j];

}

}

}

// Function to display a polynomial

void displayPolynomial(int \*poly, int size) {

int i;

for (i = size - 1; i >= 0; i--) {

if (poly[i] != 0) {

printf("%dx^%d ", poly[i], i);

if (i > 0) printf("+ ");

}

}

printf("\n");

}

int main() {

int degree1, degree2;

// Input the first polynomial

printf("Enter the degree of the first polynomial: ");

scanf("%d", &degree1);

int \*poly1 = (int \*)calloc(degree1 + 1, sizeof(int));

printf("Enter the coefficients of the first polynomial (from lowest to highest degree):\n");

for (int i = 0; i <= degree1; i++) {

printf("Coefficient of x^%d: ", i);

scanf("%d", &poly1[i]);

}

// Input the second polynomial

printf("\nEnter the degree of the second polynomial: ");

scanf("%d", &degree2);

int \*poly2 = (int \*)calloc(degree2 + 1, sizeof(int));

printf("Enter the coefficients of the second polynomial (from lowest to highest degree):\n");

for (int i = 0; i <= degree2; i++) {

printf("Coefficient of x^%d: ", i);

scanf("%d", &poly2[i]);

}

// Calculate the size of the result arrays

int maxDegree = (degree1 > degree2) ? degree1 : degree2;

int \*resultAdd = (int \*)calloc(maxDegree + 1, sizeof(int));

int \*resultSubtract = (int \*)calloc(maxDegree + 1, sizeof(int));

int \*resultMultiply = (int \*)calloc(degree1 + degree2 + 1, sizeof(int));

// Perform operations

addPolynomials(poly1, poly2, resultAdd, degree1 + 1, degree2 + 1);

subtractPolynomials(poly1, poly2, resultSubtract, degree1 + 1, degree2 + 1);

multiplyPolynomials(poly1, poly2, resultMultiply, degree1 + 1, degree2 + 1);

// Display results

printf("\nAddition of polynomials: ");

displayPolynomial(resultAdd, maxDegree + 1);

printf("\nSubtraction of polynomials: ");

displayPolynomial(resultSubtract, maxDegree + 1);

printf("\nMultiplication of polynomials: ");

displayPolynomial(resultMultiply, degree1 + degree2 + 1);

// Free dynamically allocated memory

free(poly1);

free(poly2);

free(resultAdd);

free(resultSubtract);

free(resultMultiply);

return 0;

}

Input

Enter the degree of the first polynomial: 2

Enter the coefficients of the first polynomial (from lowest to highest degree):

Coefficient of x^0: 1

Coefficient of x^1: 2

Coefficient of x^2: 3

Enter the degree of the second polynomial: 1

Enter the coefficients of the second polynomial (from lowest to highest degree):

Coefficient of x^0: 4

Coefficient of x^1: 5

Output :

Addition of polynomials: 5x^2 + 7x^1 + 5x^0

Subtraction of polynomials: -2x^2 - 3x^1 - 3x^0

Multiplication of polynomials: 15x^3 + 25x^2 + 29x^1 + 4x^0