

Practical Code from Practical 7 to Practical 14

Practical 7

25. Develop a program to print numbers from 1 to 10.

```
#include <stdio.h>

int main() {
    for (int i = 1; i <= 10; i++) {
        printf("%d\n", i);
    }
    return 0;
}
```

26. Develop a program to print odd numbers from 1 to n.

```
#include <stdio.h>

int main() {
    int n;
    printf("Enter the value of n: ");
    scanf("%d", &n);
    for (int i = 1; i <= n; i++) {
        if (i % 2 != 0) {
            printf("%d\n", i);
        }
    }
    return 0;
}
```

27. Develop a program to calculate the sum of first n natural numbers.

```
#include <stdio.h>

int main() {
    int n, sum = 0;
```

```

printf("Enter the value of n: ");
scanf("%d", &n);
for (int i = 1; i <= n; i++) {
    sum += i;
}
printf("The sum of the first %d natural numbers is: %d\n", n, sum);
return 0;
}

```

28. Develop a program to display the n terms of odd natural number and their sum.

```

#include <stdio.h>

int main() {
    int n, sum = 0;
    printf("Enter the number of terms: ");
    scanf("%d", &n);
    for (int i = 1, count = 0; count < n; i += 2, count++) {
        printf("%d\n", i);
        sum += i;
    }
    printf("The sum of the first %d odd natural numbers is: %d\n", n, sum);
    return 0;
}

```

29. Develop a program to find factors of the given number.

```

#include <stdio.h>

int main() {
    int num;
    printf("Enter a number: ");
    scanf("%d", &num);
    printf("Factors of %d are: ", num);
    for (int i = 1; i <= num; i++) {
        if (num % i == 0) {

```

```

        printf("%d ", i);
    }
}
printf("\n");
return 0;
}

```

Practical 8

30. Develop a program to find the sum of $1 + (1+2) + (1+2+3) + (1+2+3+4) + \dots + (1+2+3+4+\dots+n)$.

```

#include <stdio.h>

int main() {
    int n, sum = 0, termSum = 0;
    printf("Enter the value of n: ");
    scanf("%d", &n);

    for (int i = 1; i <= n; i++) {
        termSum += i; // Sum of numbers from 1 to i
        sum += termSum; // Add the termSum to the total sum
    }
    printf("The total sum is: %d\n", sum);
    return 0;
}

```

31. Develop a program to compute the value of e^x by using the formula $e^x = 1 + x/1! + x^2/2! + x^3/3! + \dots$

```

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

double factorial(int num) {
    double fact = 1;
    for (int i = 1; i <= num; i++) {
        fact *= i;
    }
}

```

```

    }
    return fact;
}

int main() {
    double x, sum = 1.0; // Start with 1 for the first term
    int terms;
    printf("Enter the value of x: ");
    scanf("%lf", &x);
    printf("Enter the number of terms: ");
    scanf("%d", &terms);
    for (int i = 1; i < terms; i++) {
        sum += pow(x, i) / factorial(i); // Add each term to the sum
    }
    printf("The value of e^%.2lf is: %.6lf\n", x, sum);
    return 0;
}

```

32. Develop a program to find out prime numbers between given two numbers.

```

#include <stdio.h>

int isPrime(int num) {
    if (num <= 1) return 0; // Numbers less than or equal to 1 are not prime
    for (int i = 2; i * i <= num; i++) {
        if (num % i == 0) return 0; // If divisible by any number, not prime
    }
    return 1; // Prime number
}

int main() {
    int start, end;

    // Input two numbers
    printf("Enter the start number: ");

```

```

scanf("%d", &start);
printf("Enter the end number: ");
scanf("%d", &end);
printf("Prime numbers between %d and %d are:\n", start, end);
for (int i = start; i <= end; i++) {
    if (isPrime(i)) {
        printf("%d ", i);
    }
}
printf("\n");
return 0;
}

```

Practical 9

33. Develop a program to display following patterns

Question 33: (1) Develop a program to display following patterns.

```

#include<stdio.h>

int main()
{
    int i, j, n, t=1;
    printf("Enter the value of n: \n");
    scanf("%d", &n);
    for(i=1 ; i<=n; i++)
    {
        for(j=1; j<=i; j++)
        {
            printf("%d \t", t);
            t++;
        }
    }
}

```

```

        printf("\n");
    }
    return 0;
}

```

Question 33: (2) Develop a program to display following patterns.

```

#include<stdio.h>

int main(){
    int i, j, n;
    printf("Enter the value of n: \n");
    scanf("%d", &n);
    for(i = 1; i <= n; i++) {
        for(j = 1; j <= i; j++) {
            if((i + j) % 2 == 0) {
                printf("1 ");
            } else {
                printf("0 ");
            }
        }
        printf("\n");
    }
    return 0;
}

```

Question 33: (3) Develop a program to display following patterns.

```

#include<stdio.h>

int main()
{
    int n, i, j, num = 1;
    char ch = 'A';

```

```

        printf("Enter the number of rows: ");
scanf("%d", &n);
for(i = 1; i <= n; i++)
{
    for(j = 1; j <= n - i; j++)
    {
        printf(" ");
    }
    if(i % 2 != 0) // Odd row (numbers)
    {
        for(j = 1; j <= i; j++)
        {
            printf("%d ", num);
            num++;
        }
    }
    else // Even row (letters)
    {
        for(j = 1; j <= i; j++)
        {
            printf("%c ", ch);
            ch++;
        }
    }
    printf("\n");
}
return 0;
}

```

Question 33: (4) Develop a program to display following patterns.

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

```

int main()
{
    int i, j, n;
    printf("Enter the number of rows: ");
    scanf("%d", &n);

    for(i = 1; i <= n; i++)
    {
        for(j = 1; j <= n - i; j++)
        {
            printf(" ");
        }
        for(j = 1; j <= i; j++)
        {
            printf("* ");
        }
        printf("\n");
    }
    return 0;
}

```

Question 33: (5) Develop a program to display following patterns.

```

#include<stdio.h>

int main()
{
    int i, j, k, n;
    printf("Enter the number of rows: ");
    scanf("%d", &n);
    for(i = n; i >= 1; i--)
    {
        for(j = 1; j <= n - i; j++)

```



```

    {
        printf(" ");
    }
    for(k = 1; k <= (2 * i - 1); k++)
    {
        printf("* ");
    }
    printf("\n");
}
return 0;
}

```

34. Develop a program to draw Pascal's triangle.

```

#include<stdio.h>

int main()
{
    int i, n, j, c;
    printf("Enter the number of rows for Pascal's Triangle: \n");
    scanf("%d", &n);
    for(i = 0; i < n; i++)
    {
        for(j = 0; j < n - i - 1; j++)
        {
            printf(" ");
        }
        c = 1;
        for(j = 0; j <= i; j++)
        {
            printf("%d ", c);
            c = c * (i - j) / (j + 1);
        }
    }
}

```

```

        printf("\n");
    }
    return 0;
}

```

Practical 10

35. Develop a program to count number of positive or negative number from an array of n numbers

```

#include <stdio.h>

int main() {
    int n, countPositive = 0, countNegative = 0;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter %d numbers:\n", n);
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
        if (arr[i] > 0) {
            countPositive++;
        } else if (arr[i] < 0) {
            countNegative++;
        }
    }
    printf("Positive numbers: %d\n", countPositive);
    printf("Negative numbers: %d\n", countNegative);
    return 0;
}

```

36. Develop a program to read n numbers in an array and print them in reverse order.

```

#include <stdio.h>

int main() {
    int n;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter %d numbers:\n", n);
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    printf("Array in reverse order:\n");
    for (int i = n - 1; i >= 0; i--) {
        printf("%d ", arr[i]);
    }
    printf("\n");
    return 0;
}

```

37. Develop a program to find Max, Min, Sum, Avg of given numbers from an array

```

#include <stdio.h>

int main() {
    int n;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n], max, min, sum = 0;
    printf("Enter %d numbers:\n", n);
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
        if (i == 0) {
            max = min = arr[i];

```

```

    }
    if (arr[i] > max) {
        max = arr[i];
    }
    if (arr[i] < min) {
        min = arr[i];
    }
    sum += arr[i];
}
double avg = (double)sum / n;
printf("Max: %d\nMin: %d\nSum: %d\nAvg: %.2lf\n", max, min, sum, avg);
return 0;
}

```

38. Develop a program to sort elements of an array in an ascending order

```

#include <stdio.h>

int main() {
    int n;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter %d numbers:\n", n);
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    // Bubble sort
    for (int i = 0; i < n - 1; i++) {
        for (int j = 0; j < n - i - 1; j++) {
            if (arr[j] > arr[j + 1]) {
                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }
}

```

```

        arr[j + 1] = temp;
    }
}
}
printf("Sorted array in ascending order:\n");
for (int i = 0; i < n; i++) {
    printf("%d ", arr[i]);
}
printf("\n");
return 0;
}

```

Practical 11

39. Develop a program to read values in two dimensional array and print them in matrix form.

```

#include <stdio.h>

int main() {
    int rows, cols;
    printf("Enter number of rows: ");
    scanf("%d", &rows);
    printf("Enter number of columns: ");
    scanf("%d", &cols);
    int matrix[rows][cols];
    // Read matrix elements
    printf("Enter elements of the matrix:\n");
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            scanf("%d", &matrix[i][j]);
        }
    }
}

```

```

// Print matrix
printf("Matrix is:\n");
for (int i = 0; i < rows; i++) {
    for (int j = 0; j < cols; j++) {
        printf("%d ", matrix[i][j]);
    }
    printf("\n");
}
return 0;
}

```

40. Develop a program to count number of positive, negative and zero elements from 3x3 matrix.

```

#include <stdio.h>

int main() {
    int matrix[3][3];
    int positive = 0, negative = 0, zero = 0;
    // Read 3x3 matrix elements
    printf("Enter elements of the 3x3 matrix:\n");
    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            scanf("%d", &matrix[i][j]);
        }
    }
    // Count positive, negative, and zero elements
    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            if (matrix[i][j] > 0) {
                positive++;
            } else if (matrix[i][j] < 0) {
                negative++;
            }
        }
    }
}

```

```

        } else {
            zero++;
        }
    }
}

// Display results
printf("Positive numbers: %d\n", positive);
printf("Negative numbers: %d\n", negative);
printf("Zero numbers: %d\n", zero);
return 0;
}

```

41. Develop a program to perform addition of two matrices.

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

```

int main() {
    int rows, cols;
    printf("Enter number of rows: ");
    scanf("%d", &rows);
    printf("Enter number of columns: ");
    scanf("%d", &cols);

    int matrix1[rows][cols], matrix2[rows][cols], result[rows][cols];
    printf("Enter elements of first matrix:\n");
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            scanf("%d", &matrix1[i][j]);
        }
    }

    // Read second matrix
    printf("Enter elements of second matrix:\n");
    for (int i = 0; i < rows; i++) {

```

```

        for (int j = 0; j < cols; j++) {
            scanf("%d", &matrix2[i][j]);
        }
    }

// Add matrices
for (int i = 0; i < rows; i++) {
    for (int j = 0; j < cols; j++) {
        result[i][j] = matrix1[i][j] + matrix2[i][j];
    }
}

// Display result
printf("Resultant matrix after addition:\n");
for (int i = 0; i < rows; i++) {
    for (int j = 0; j < cols; j++) {
        printf("%d ", result[i][j]);
    }
    printf("\n");
}
return 0;
}

```

42. Develop a program to calculate the length of given string using strlen.

```

#include <stdio.h>
#include <string.h>
int main() {
    char str[100];
    // Input string
    printf("Enter a string: ");
    fgets(str, sizeof(str), stdin);
}

```



```

// Calculate length
int length = strlen(str) - 1; // Subtract 1 to exclude the newline character
printf("Length of the string is: %d\n", length);
return 0;
}

```

43. Develop a program to copy string using strcpy.

```

#include <stdio.h>
#include <string.h>
int main() {
    char source[100], destination[100];
    // Input string
    printf("Enter a string: ");
    fgets(source, sizeof(source), stdin);
    // Copy string
    strcpy(destination, source);
    printf("Copied string: %s\n", destination);
    return 0;
}

```

44. Develop a program to compare two strings using strcmp.

```

#include <stdio.h>
#include <string.h>
int main() {
    char str1[100], str2[100];
    // Input strings
    printf("Enter first string: ");
    fgets(str1, sizeof(str1), stdin);
    printf("Enter second string: ");

```

```

fgets(str2, sizeof(str2), stdin);
// Compare strings
int result = strcmp(str1, str2);
if (result == 0) {
    printf("The strings are equal.\n");
} else if (result < 0) {
    printf("The first string is less than the second.\n");
} else {
    printf("The first string is greater than the second.\n");
}
return 0;
}

```

45. Develop a program to concatenate two strings using strcat.

```

#include <stdio.h>
#include <string.h>
int main() {
    char str1[100], str2[100];
    // Input strings
    printf("Enter first string: ");
    fgets(str1, sizeof(str1), stdin);
    printf("Enter second string: ");
    fgets(str2, sizeof(str2), stdin);
    // Remove newline characters added by fgets
    str1[strcspn(str1, "\n")] = 0;
    str2[strcspn(str2, "\n")] = 0;
    // Concatenate strings
    strcat(str1, str2);
    printf("Concatenated string: %s\n", str1);
    return 0;
}

```

46. Develop a program to reverse string using strrev

```
#include <stdio.h>
#include <string.h>
int main() {
    char str[100];
    // Input string
    printf("Enter a string: ");
    fgets(str, sizeof(str), stdin);
    // Remove newline character added by fgets
    str[strcspn(str, "\n")] = 0;
    // Reverse string
    strrev(str);
    printf("Reversed string: %s\n", str);
    return 0;
}
```

Practical 12

47. Develop a program to count simple interest using function.

```
#include <stdio.h>
// Function to calculate simple interest
float calculateSimpleInterest(float principal, float rate, float time) {
    return (principal * rate * time) / 100;
}
int main() {
    float principal, rate, time, interest;
    // Input values
    printf("Enter principal amount: ");
    scanf("%f", &principal);
```

```

printf("Enter rate of interest: ");
scanf("%f", &rate);
printf("Enter time (in years): ");
scanf("%f", &time);
// Calculate interest
interest = calculateSimpleInterest(principal, rate, time);
// Display result
printf("Simple Interest = %.2f\n", interest);
return 0;
}

```

48. Develop a program to generate Fibonacci series of N given number using function name fibbo. (e.g. 1 1 2 3 5 8...).

```

#include <stdio.h>

// Function to generate Fibonacci series
void fibbo(int n) {
    int a = 0, b = 1, next;
    printf("Fibonacci series:\n");
    for (int i = 1; i <= n; i++) {
        printf("%d ", b);
        next = a + b;
        a = b;
        b = next;
    }
    printf("\n");
}

int main() {
    int n;

    // Input number of terms
    printf("Enter the number of terms: ");

```

```

scanf("%d", &n);
// Generate Fibonacci series
fibbo(n);
return 0;
}

```

49. Develop a program to find the factorial of a given number using Recursion.

```

#include <stdio.h>
// Recursive function to find factorial
long long factorial(int n) {
    if (n == 0 || n == 1) {
        return 1;
    }
    return n * factorial(n - 1);
}
int main() {
    int num;
    long long result;
    // Input number
    printf("Enter a number to find its factorial: ");
    scanf("%d", &num);
    if (num < 0) {
        printf("Factorial of a negative number is not defined.\n");
    } else {
        // Calculate factorial
        result = factorial(num);
        // Display result
        printf("Factorial of %d is %lld\n", num, result);
    }
}

```

```
    return 0;
}
```

Practical 13

50. Develop a program to create structure of book with book title, author name, publication, and price. Read data of n books and display them.

```
#include <stdio.h>
#include <string.h>
// Define the structure for a book
struct Book {
    char title[100];
    char author[100];
    char publication[100];
    float price;
};
int main() {
    int n;
    // Input number of books
    printf("Enter the number of books: ");
    scanf("%d", &n);
    struct Book books[n];
    // Input book details
    for (int i = 0; i < n; i++) {
        printf("\nEnter details for book %d:\n", i + 1);
        printf("Enter title: ");
        scanf(" %[^\\n]", books[i].title); // To read string with spaces
        printf("Enter author: ");
        scanf(" %[^\\n]", books[i].author);
        printf("Enter publication: ");
        scanf(" %[^\\n]", books[i].publication);
        printf("Enter price: ");
```

```

        scanf("%f", &books[i].price);
    }
    // Display book details
    printf("\nDetails of books:\n");
    for (int i = 0; i < n; i++) {
        printf("\nBook %d:\n", i + 1);
        printf("Title: %s\n", books[i].title);
        printf("Author: %s\n", books[i].author);
        printf("Publication: %s\n", books[i].publication);
        printf("Price: %.2f\n", books[i].price);
    }
    return 0;
}

```

51. Develop a program to access member of a union using union variable.

```

#include <stdio.h>
// Define a union
union Data {
    int intValue;
    float floatValue;
    char charValue;
};
int main() {
    union Data data;
    // Assign and display integer value
    data.intValue = 10;
    printf("Integer value: %d\n", data.intValue);
    // Assign and display float value
    data.floatValue = 3.14;
    printf("Float value: %.2f\n", data.floatValue);
}

```

```

// Assign and display character value
data.charValue = 'A';
printf("Character value: %c\n", data.charValue);
// Note: Only one member holds a valid value at a time in a union
return 0;
}

```

52. Develop a program to print value and address of a variable.

```

#include <stdio.h>

int main() {
    int num = 42;
    // Print value and address
    printf("Value of num: %d\n", num);
    printf("Address of num: %p\n", (void*)&num);
    return 0;
}

```

53. Develop a program to swap value of two numbers using pointer.

```

#include <stdio.h>

// Function to swap values using pointers
void swap(int *a, int *b) {
    int temp = *a;
    *a = *b;
    *b = temp;
}

int main() {
    int x, y;
    // Input values
    printf("Enter two numbers: ");
    scanf("%d %d", &x, &y);
}

```



```

printf("Before swapping: x = %d, y = %d\n", x, y);
// Call swap function
swap(&x, &y);
printf("After swapping: x = %d, y = %d\n", x, y);
return 0;
}

```

Practical 14

54. Develop a program to display content of a file.

```

#include <stdio.h>

int main() {
    char filename[100];
    FILE *file;
    char ch;
    // Input file name
    printf("Enter the name of the file to display its content: ");
    scanf("%s", filename);
    // Open the file in read mode
    file = fopen(filename, "r");
    if (file == NULL) {
        printf("Could not open file %s\n", filename);
        return 1;
    }
    // Read and display the content of the file
    printf("\nContents of the file %s:\n\n", filename);
    while ((ch = fgetc(file)) != EOF) {
        putchar(ch);
    }
}

```

```
// Close the file
fclose(file);
return 0;
}
```

55. Develop a program to copy source file to destination file.

```
#include <stdio.h>

int main() {
    char sourceFile[100], destinationFile[100];
    FILE *source, *destination;
    char ch;
    // Input source and destination file names
    printf("Enter the name of the source file: ");
    scanf("%s", sourceFile);
    printf("Enter the name of the destination file: ");
    scanf("%s", destinationFile);
    // Open the source file in read mode
    source = fopen(sourceFile, "r");
    if (source == NULL) {
        printf("Could not open source file %s\n", sourceFile);
        return 1;
    }
    // Open the destination file in write mode
    destination = fopen(destinationFile, "w");
    if (destination == NULL) {
        printf("Could not open destination file %s\n", destinationFile);
        fclose(source);
        return 1;
    }
    // Copy content from source to destination
    while ((ch = fgetc(source)) != EOF) {
```

```
        fputc(ch, destination);
    }
    printf("File copied successfully from %s to %s\n", sourceFile, destinationFile);
    // Close the files
    fclose(source);
    fclose(destination);
    return 0;
}
```