**Assignment 5**

**Function Type 1**

#include <stdio.h>

#include <math.h>

#include <stdlib.h> // for exit()

// Function declarations

// Function declarations

// Assignment 1

void assignment\_1();

void fahrenheit\_to\_celsius();

void find\_area\_and\_perimeter();

void input\_three\_digit\_number();

void check\_even\_or\_odd();

void calculate\_total\_salary();

void check\_marriage\_eligibility();

// Assignment 2

void assignment\_2();

void item\_price\_with\_discount();

void find\_greatest\_of\_three();

void calculator\_with\_operator();

void display\_menu();

void check\_student\_discount();

// Assignment 3

void assignment\_3();

void print\_1\_to\_10();

void print\_table\_for\_number();

void sum\_in\_range();

void check\_prime\_number();

void check\_armstrong\_number();

void check\_perfect\_number();

void factorial\_of\_number();

void check\_strong\_number();

void check\_palindrome\_number();

void add\_first\_and\_last\_digits();

// Assignment 4

void assignment\_4();

void prime\_numbers\_in\_range();

void armstrong\_numbers\_in\_range();

void perfect\_numbers\_in\_range();

void strong\_numbers\_in\_range();

void generate\_fibonacci\_series();

int main()

{

    int choice;

    while (1)

    {

        printf("\n================ MAIN MENU ================\n");

        printf("1) Assignment 1\n2) Assignment 2\n3) Assignment 3\n4) Assignment 4\n0) Exit\n");

        printf("Enter Your Assignment No: ");

        scanf("%d", &choice);

        switch (choice)

        {

        case 1:

            assignment\_1();

            break;

        case 2:

            assignment\_2();

            break;

        case 3:

            assignment\_3();

            break;

        case 4:

            assignment\_4();

            break;

        case 0:

            exit(0);

        default:

            printf("Invalid Choice. Try again.\n");

        }

    }

    return 0;

}

// Type 1: Without return type, no parameters

// ====================================================================== Type 1: Without return type, no parameters  ======================================================================

// ================= Assignment 1 =================

void assignment\_1()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 1 ----------------\n");

        printf("1) Celsius to Fahrenheit\n");

        printf("2) Area and Perimeter\n");

        printf("3) Input 3-digit number\n");

        printf("4) Even or Odd\n");

        printf("5) Total Salary Calculation\n");

        printf("6) Marriage Eligibility\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        switch (ch)

        {

        case 1:

            fahrenheit\_to\_celsius();

            break;

        case 2:

            find\_area\_and\_perimeter();

            break;

        case 3:

            input\_three\_digit\_number();

            break;

        case 4:

            check\_even\_or\_odd();

            break;

        case 5:

            calculate\_total\_salary();

            break;

        case 6:

            check\_marriage\_eligibility();

            break;

        case 0:

            return;

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

    printf("\n-------------- End of Assignment 1 ------------\n");

}

void fahrenheit\_to\_celsius()

{

    int celsius, fahrenheit;

    printf("\n1. Convert Celsius to Fahrenheit\n");

    printf("Enter temperature in Celsius: ");

    scanf("%d", &celsius);

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

    printf("Temperature in Fahrenheit: %d°F\n", fahrenheit);

}

void find\_area\_and\_perimeter()

{

    int choice, length, width, radius;

    float area, perimeter;

    const float pi = 3.14f;

    printf("\n2. Area and Perimeter Calculation\n");

    printf("1) Rectangle\n2) Circle\n");

    printf("Enter choice: ");

    scanf("%d", &choice);

    if (choice == 1)

    {

        printf("Enter length: ");

        scanf("%d", &length);

        printf("Enter width: ");

        scanf("%d", &width);

        area = length \* width;

        perimeter = 2 \* (length + width);

        printf("Rectangle Area: %.2f\nRectangle Perimeter: %.2f\n", area, perimeter);

    }

    else if (choice == 2)

    {

        printf("Enter radius: ");

        scanf("%d", &radius);

        area = pi \* radius \* radius;

        perimeter = 2 \* pi \* radius;

        printf("Circle Area: %.2f\nCircle Perimeter: %.2f\n", area, perimeter);

    }

    else

    {

        printf("Invalid choice.\n");

    }

}

void input\_three\_digit\_number()

{

    int no, n1, n2, n3, sum;

    printf("\n3. Sum and Reverse of a 3-digit Number\n");

    printf("Enter a 3-digit number: ");

    scanf("%d", &no);

    if (no >= 100 && no <= 999)

    {

        n1 = no / 100;

        n2 = (no / 10) % 10;

        n3 = no % 10;

        sum = n1 + n2 + n3;

        printf("Digits: %d, %d, %d\n", n1, n2, n3);

        printf("Sum of digits: %d\n", sum);

        printf("Reverse of number: %d%d%d\n", n3, n2, n1);

    }

    else

    {

        printf("Invalid input. Not a 3-digit number.\n");

    }

}

void check\_even\_or\_odd()

{

    int no;

    printf("\n4. Even or Odd\n");

    printf("Enter a number: ");

    scanf("%d", &no);

    if (no % 2 == 0)

        printf("%d is Even\n", no);

    else

        printf("%d is Odd\n", no);

}

void calculate\_total\_salary()

{

    double basic, da, ta, hra, totalSalary;

    printf("\n5. Total Salary Calculation\n");

    printf("Enter Basic Salary: ");

    scanf("%lf", &basic);

    if (basic <= 5000)

    {

        da = basic \* 0.10;

        ta = basic \* 0.20;

        hra = basic \* 0.25;

    }

    else

    {

        da = basic \* 0.15;

        ta = basic \* 0.25;

        hra = basic \* 0.30;

    }

    totalSalary = basic + da + ta + hra;

    printf("Total Salary = %.2lf\n", totalSalary);

}

void check\_marriage\_eligibility()

{

    int male\_age, female\_age;

    printf("\n6. Marriage Eligibility Check\n");

    printf("Enter Male Age: ");

    scanf("%d", &male\_age);

    printf("Enter Female Age: ");

    scanf("%d", &female\_age);

    if (male\_age >= 21)

        printf("Male is eligible for marriage.\n");

    else

        printf("Male is NOT eligible for marriage.\n");

    if (female\_age >= 18)

        printf("Female is eligible for marriage.\n");

    else

        printf("Female is NOT eligible for marriage.\n");

}

// ================= Assignment 2 =================

void assignment\_2()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 2 ----------------\n");

        printf("1) Item Price with Discount\n");

        printf("2) Greatest of Three Numbers\n");

        printf("3) Calculator with Operator\n");

        printf("4) Display Menu\n");

        printf("5) Check Student Discount\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        switch (ch)

        {

        case 1:

            item\_price\_with\_discount();

            break;

        case 2:

            find\_greatest\_of\_three();

            break;

        case 3:

            calculator\_with\_operator();

            break;

        case 4:

            display\_menu();

            break;

        case 5:

            check\_student\_discount();

            break;

        case 0:

            return;

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

}

void item\_price\_with\_discount()

{

    int price, discountRate, discount, finalPrice;

    printf("\nQ1. Price Item Discount\n");

    printf("Enter the price of the item: ");

    scanf("%d", &price);

    if (price <= 1000)

    {

        discountRate = 5;

    }

    else if (price <= 5000)

    {

        discountRate = 10;

    }

    else

    {

        discountRate = 20;

    }

    discount = (price \* discountRate) / 100;

    finalPrice = price - discount;

    printf("Discount: %d\n", discount);

    printf("Final Price after discount: %d\n", finalPrice);

}

void find\_greatest\_of\_three()

{

    int a, b, c;

    printf("\nQ2. Greatest of Three Numbers\n");

    printf("Enter three numbers: ");

    scanf("%d %d %d", &a, &b, &c);

    if (a >= b)

    {

        if (a >= c)

            printf("Greatest number: %d\n", a);

        else

            printf("Greatest number: %d\n", c);

    }

    else

    {

        if (b >= c)

            printf("Greatest number: %d\n", b);

        else

            printf("Greatest number: %d\n", c);

    }

    if (a == b && b == c)

    {

        printf("All numbers are equal.\n");

    }

}

void calculator\_with\_operator()

{

    int num1, num2, result;

    char op;

    printf("\nQ3. Calculator using Operator\n");

    printf("Enter two numbers: ");

    scanf("%d %d", &num1, &num2);

    printf("Enter an operator (+, -, \*, /, %%): ");

    scanf(" %c", &op);

    switch (op)

    {

    case '+':

        result = num1 + num2;

        printf("Result: %d\n", result);

        break;

    case '-':

        result = num1 - num2;

        printf("Result: %d\n", result);

        break;

    case '\*':

        result = num1 \* num2;

        printf("Result: %d\n", result);

        break;

    case '/':

        if (num2 != 0)

        {

            result = num1 / num2;

            printf("Result: %d\n", result);

        }

        else

        {

            printf("Error: Division by zero is not allowed.\n");

        }

        break;

    case '%':

        if (num2 != 0)

        {

            result = num1 % num2;

            printf("Result: %d\n", result);

        }

        else

        {

            printf("Error: Division by zero is not allowed.\n");

        }

        break;

    default:

        printf("Invalid operator!\n");

        break;

    }

}

void display\_menu()

{

    int choice;

    printf("\nQ4. Menu: Even/Odd or Basic Salary\n");

    printf("1. Check Even/Odd\n2. Calculate Basic Salary\n");

    printf("Enter your choice: ");

    scanf("%d", &choice);

    if (choice == 1)

    {

        int number;

        printf("Enter a number: ");

        scanf("%d", &number);

        if (number % 2 == 0)

            printf("%d is Even.\n", number);

        else

            printf("%d is Odd.\n", number);

    }

    else if (choice == 2)

    {

        double basic, hra, da, gross;

        printf("Enter Basic Salary: ");

        scanf("%lf", &basic);

        hra = 0.20 \* basic;

        da = 0.50 \* basic;

        gross = basic + hra + da;

        printf("Gross Salary: %.2lf\n", gross);

    }

    else

    {

        printf("Invalid choice!\n");

    }

}

void check\_student\_discount()

{

    int price, isStudent;

    double discount = 0.0, finalPrice;

    printf("\nQ5. Student Discount\n");

    printf("Enter the total purchase amount: ");

    scanf("%d", &price);

    printf("Are you a student? (1 = Yes, 2 = No): ");

    scanf("%d", &isStudent);

    if (isStudent == 1)

    {

        if (price > 500)

        {

            discount = 0.20 \* price;

            printf("20%% student discount applied.\n");

        }

        else

        {

            discount = 0.10 \* price;

            printf("10%% student discount applied.\n");

        }

    }

    else if (isStudent == 2)

    {

        if (price > 600)

        {

            discount = 0.15 \* price;

            printf("15%% non-student discount applied.\n");

        }

        else

        {

            printf("No discount applicable.\n");

        }

    }

    else

    {

        printf("Invalid input for student status.\n");

        return;

    }

    finalPrice = price - discount;

    printf("Final price after discount: %.2lf\n", finalPrice);

}

// ================= Assignment 3 =================

void assignment\_3()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 3 ----------------\n");

        printf("1) Print 1 to 10\n");

        printf("2) Print Table for Number\n");

        printf("3) Sum in Range\n");

        printf("4) Check Prime Number\n");

        printf("5) Check Armstrong Number\n");

        printf("6) Check Perfect Number\n");

        printf("7) Factorial of Number\n");

        printf("8) Check Strong Number\n");

        printf("9) Check Palindrome Number\n");

        printf("10) Add First and Last Digits\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        switch (ch)

        {

        case 1:

            print\_1\_to\_10();

            break;

        case 2:

            print\_table\_for\_number();

            break;

        case 3:

            sum\_in\_range();

            break;

        case 4:

            check\_prime\_number();

            break;

        case 5:

            check\_armstrong\_number();

            break;

        case 6:

            check\_perfect\_number();

            break;

        case 7:

            factorial\_of\_number();

            break;

        case 8:

            check\_strong\_number();

            break;

        case 9:

            check\_palindrome\_number();

            break;

        case 10:

            add\_first\_and\_last\_digits();

            break;

        case 0:

            return;

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

}

void print\_1\_to\_10()

{

    // Q1. Print numbers from 1 to 10

    printf("\nQ1. Numbers from 1 to 10:\n");

    for (int i = 1; i <= 10; i++)

    {

        printf("%d ", i);

    }

    printf("\n");

}

void print\_table\_for\_number()

{

    // Q2. Print multiplication table for a given number

    int num;

    printf("\nQ2. Enter a number to print its table: ");

    scanf("%d", &num);

    for (int i = 1; i <= 10; i++)

    {

        printf("%d x %d = %d\n", num, i, num \* i);

    }

}

void sum\_in\_range()

{

    // Q3. Calculate sum of numbers in given range

    int start, end, sum = 0;

    printf("\nQ3. Enter start and end range: ");

    scanf("%d %d", &start, &end);

    for (int i = start; i <= end; i++)

    {

        sum += i;

    }

    printf("Sum is: %d\n", sum);

}

void check\_prime\_number()

{

    // Q4. Check number is prime or not

    int num, isPrime = 1;

    printf("\nQ4. Enter a number to check if prime: ");

    scanf("%d", &num);

    if (num <= 1)

    {

        isPrime = 0;

    }

    else

    {

        for (int i = 2; i <= num / 2; i++)

        {

            if (num % i == 0)

            {

                isPrime = 0;

                break;

            }

        }

    }

    if (isPrime)

        printf("%d is a Prime number.\n", num);

    else

        printf("%d is not a Prime number.\n", num);

}

void check\_armstrong\_number()

{

    // Q5. Check number is Armstrong or not

    int num, original, temp, digits = 0, sum = 0;

    printf("\nQ5. Enter a number to check Armstrong: ");

    scanf("%d", &num);

    original = num;

    temp = num;

    while (temp > 0)

    {

        temp /= 10;

        digits++;

    }

    temp = num;

    while (temp > 0)

    {

        int rem = temp % 10, power = 1;

        for (int i = 0; i < digits; i++)

        {

            power \*= rem;

        }

        sum += power;

        temp /= 10;

    }

    if (original == sum)

        printf("%d is an Armstrong number.\n", original);

    else

        printf("%d is not an Armstrong number.\n", original);

}

void check\_perfect\_number()

{

    // Q6. Check number is perfect or not

    int num, sum = 0;

    printf("\nQ6. Enter a number to check Perfect: ");

    scanf("%d", &num);

    for (int i = 1; i <= num / 2; i++)

    {

        if (num % i == 0)

            sum += i;

    }

    if (sum == num)

        printf("%d is a Perfect number.\n", num);

    else

        printf("%d is not a Perfect number.\n", num);

}

void factorial\_of\_number()

{

    // Q7. Find factorial of a number

    int num, factorial = 1;

    printf("\nQ7. Enter a number to find factorial: ");

    scanf("%d", &num);

    for (int i = 1; i <= num; i++)

    {

        factorial \*= i;

    }

    printf("Factorial of %d is %d\n", num, factorial);

}

void check\_strong\_number()

{

    // Q8. Check number is strong or not

    int num, original, sum = 0;

    printf("\nQ8. Enter a number to check Strong: ");

    scanf("%d", &num);

    original = num;

    while (num > 0)

    {

        int digit = num % 10;

        int fact = 1;

        for (int i = 1; i <= digit; i++)

        {

            fact \*= i;

        }

        sum += fact;

        num /= 10;

    }

    if (sum == original)

        printf("%d is a Strong number.\n", original);

    else

        printf("%d is not a Strong number.\n", original);

}

void check\_palindrome\_number()

{

    // Q9. Check number is palindrome or not

    int num, original, reversed = 0;

    printf("\nQ9. Enter a number to check Palindrome: ");

    scanf("%d", &num);

    original = num;

    while (num > 0)

    {

        reversed = reversed \* 10 + (num % 10);

        num /= 10;

    }

    if (original == reversed)

        printf("%d is a Palindrome number.\n", original);

    else

        printf("%d is not a Palindrome number.\n", original);

}

void add\_first\_and\_last\_digits()

{

    // Q10. Add first and last digit of a number

    int num, firstDigit, lastDigit;

    printf("\nQ10. Enter a number to add first and last digit: ");

    scanf("%d", &num);

    lastDigit = num % 10;

    while (num >= 10)

    {

        num /= 10;

    }

    firstDigit = num;

    printf("Sum of first and last digit is: %d + %d = %d\n", firstDigit, lastDigit, firstDigit + lastDigit);

}

// ================= Assignment 4 =================

void assignment\_4()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 4 ----------------\n");

        printf("1) Prime Numbers in Range\n");

        printf("2) Armstrong Numbers in Range\n");

        printf("3) Perfect Numbers in Range\n");

        printf("4) Strong Numbers in Range\n");

        printf("5) Generate Fibonacci Series\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        switch (ch)

        {

        case 1:

            prime\_numbers\_in\_range();

            break;

        case 2:

            armstrong\_numbers\_in\_range();

            break;

        case 3:

            perfect\_numbers\_in\_range();

            break;

        case 4:

            strong\_numbers\_in\_range();

            break;

        case 5:

            generate\_fibonacci\_series();

            break;

        case 0:

            return;

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

}

void prime\_numbers\_in\_range()

{

    // Q1. Print prime numbers in range

    int start = 1, end = 1000;

    printf("\nQ1. Prime numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        if (num < 2)

            continue;

        int is\_prime = 1;

        for (int i = 2; i \* i <= num; i++)

        {

            if (num % i == 0)

            {

                is\_prime = 0;

                break;

            }

        }

        if (is\_prime)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

void armstrong\_numbers\_in\_range()

{

    // Q2. Print Armstrong numbers in range

    int start = 1, end = 1000;

    printf("\nQ2. Armstrong numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        int original = num, sum = 0, digits = 0, temp = num;

        while (temp > 0)

        {

            temp /= 10;

            digits++;

        }

        temp = num;

        while (temp > 0)

        {

            int digit = temp % 10;

            sum += pow(digit, digits);

            temp /= 10;

        }

        if (sum == original)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

void perfect\_numbers\_in\_range()

{

    // Q3. Print Perfect numbers in range

    int start = 1, end = 1000;

    printf("\nQ3. Perfect numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        int sum = 0;

        for (int i = 1; i <= num / 2; i++)

        {

            if (num % i == 0)

            {

                sum += i;

            }

        }

        if (sum == num)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

void strong\_numbers\_in\_range()

{

    // Q4. Print Strong numbers in range

    int start = 1, end = 1000;

    printf("\nQ4. Strong numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        int original = num, sum = 0, temp = num;

        while (temp > 0)

        {

            int digit = temp % 10;

            int factorial = 1;

            for (int i = 1; i <= digit; i++)

            {

                factorial \*= i;

            }

            sum += factorial;

            temp /= 10;

        }

        if (sum == original)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

void generate\_fibonacci\_series()

{

    // Q5. Print Fibonacci series (optional)

    int n = 10;

    int first = 0, second = 1;

    printf("\nQ5. First %d terms of Fibonacci Series:\n", n);

    for (int i = 0; i < n; i++)

    {

        printf("%d ", first);

        int next = first + second;

        first = second;

        second = next;

    }

    printf("\n--------------------------------\n");

}

**Function Type 2**

#include <stdio.h>

#include <math.h>

#include <stdlib.h> // for exit()

#include <string.h>

// Function declarations

// Assignment 1

void assignment\_1();

int fahrenheit\_to\_celsius();

int find\_area\_and\_perimeter();

int input\_three\_digit\_number();

int check\_even\_or\_odd();

double calculate\_total\_salary();

int check\_marriage\_eligibility();

// Assignment 2

int assignment\_2();

int item\_price\_with\_discount();

int find\_greatest\_of\_three();

int calculator\_with\_operator();

int display\_menu();

double check\_student\_discount();

// Assignment 3

void assignment\_3();

void print\_1\_to\_10();

void print\_table\_for\_number();

int sum\_in\_range();

int check\_prime\_number();

int check\_armstrong\_number();

int check\_perfect\_number();

int factorial\_of\_number();

int check\_strong\_number();

int check\_palindrome\_number();

int add\_first\_and\_last\_digits();

// Assignment 4

void assignment\_4();

void prime\_numbers\_in\_range();

void armstrong\_numbers\_in\_range();

void perfect\_numbers\_in\_range();

void strong\_numbers\_in\_range();

void generate\_fibonacci\_series();

int main()

{

    int choice;

    while (1)

    {

        printf("\n================ MAIN MENU ================\n");

        printf("1) Assignment 1\n2) Assignment 2\n3) Assignment 3\n4) Assignment 4\n0) Exit\n");

        printf("Enter Your Assignment No: ");

        scanf("%d", &choice);

        switch (choice)

        {

        case 1:

            assignment\_1();

            break;

            case 2:

            assignment\_2();

            break;

            case 3:

            assignment\_3();

            break;

            case 4:

            assignment\_4();

            break;

            case 0:

            exit(0);

            default:

            printf("Invalid Choice. Try again.\n");

        }

    }

    return 0;

}

// Type 1: Without return type, no parameters

// ====================================================================== Type 2: With return type, no parameters  ======================================================================

// ================= Assignment 1 =================

void assignment\_1()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 1 ----------------\n");

        printf("1) Celsius to Fahrenheit\n");

        printf("2) Area and Perimeter\n");

        printf("3) Input 3-digit number\n");

        printf("4) Even or Odd\n");

        printf("5) Total Salary Calculation\n");

        printf("6) Marriage Eligibility\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        switch (ch)

        {

            case 1:

            fahrenheit\_to\_celsius();

            break;

            case 2:

            find\_area\_and\_perimeter();

            break;

            case 3:

            input\_three\_digit\_number();

            break;

            case 4:

            check\_even\_or\_odd();

            break;

            case 5:

            calculate\_total\_salary();

            break;

            case 6:

            check\_marriage\_eligibility();

            break;

            case 0:

            return;

            default:

            printf("Invalid choice. Try again.\n");

        }

    }

    printf("\n-------------- End of Assignment 1 ------------\n");

}

int fahrenheit\_to\_celsius()

{

    int celsius, fahrenheit;

    printf("\n1. Convert Celsius to Fahrenheit\n");

    printf("Enter temperature in Celsius: ");

    scanf("%d", &celsius);

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

    printf("Temperature in Fahrenheit: %d°F\n", fahrenheit);

    return fahrenheit;

}

int find\_area\_and\_perimeter()

{

    int choice, length, width, radius;

    float area, perimeter;

    const float pi = 3.14f;

    printf("\n2. Area and Perimeter Calculation\n");

    printf("1) Rectangle\n2) Circle\n");

    printf("Enter choice: ");

    scanf("%d", &choice);

    if (choice == 1)

    {

        printf("Enter length: ");

        scanf("%d", &length);

        printf("Enter width: ");

        scanf("%d", &width);

        area = length \* width;

        perimeter = 2 \* (length + width);

        printf("Rectangle Area: %.2f\nRectangle Perimeter: %.2f\n", area, perimeter);

    }

    else if (choice == 2)

    {

        printf("Enter radius: ");

        scanf("%d", &radius);

        area = pi \* radius \* radius;

        perimeter = 2 \* pi \* radius;

        printf("Circle Area: %.2f\nCircle Perimeter: %.2f\n", area, perimeter);

    }

    else

    {

        printf("Invalid choice.\n");

        return 0;

    }

    return 1;

}

int input\_three\_digit\_number()

{

    int no, n1, n2, n3, sum;

    printf("\n3. Sum and Reverse of a 3-digit Number\n");

    printf("Enter a 3-digit number: ");

    scanf("%d", &no);

    if (no >= 100 && no <= 999)

    {

        n1 = no / 100;

        n2 = (no / 10) % 10;

        n3 = no % 10;

        sum = n1 + n2 + n3;

        printf("Digits: %d, %d, %d\n", n1, n2, n3);

        printf("Sum of digits: %d\n", sum);

        printf("Reverse of number: %d%d%d\n", n3, n2, n1);

        return sum;

    }

    else

    {

        printf("Invalid input. Not a 3-digit number.\n");

        return -1;

    }

}

int check\_even\_or\_odd()

{

    int no;

    printf("\n4. Even or Odd\n");

    printf("Enter a number: ");

    scanf("%d", &no);

    if (no % 2 == 0)

    {

        printf("%d is Even\n", no);

        return 1;

    }

    else

    {

        printf("%d is Odd\n", no);

        return 0;

    }

}

double calculate\_total\_salary()

{

    double basic, da, ta, hra, totalSalary;

    printf("\n5. Total Salary Calculation\n");

    printf("Enter Basic Salary: ");

    scanf("%lf", &basic);

    if (basic <= 5000)

    {

        da = basic \* 0.10;

        ta = basic \* 0.20;

        hra = basic \* 0.25;

    }

    else

    {

        da = basic \* 0.15;

        ta = basic \* 0.25;

        hra = basic \* 0.30;

    }

    totalSalary = basic + da + ta + hra;

    printf("Total Salary = %.2lf\n", totalSalary);

    return totalSalary;

}

int check\_marriage\_eligibility()

{

    int male\_age, female\_age;

    printf("\n6. Marriage Eligibility Check\n");

    printf("Enter Male Age: ");

    scanf("%d", &male\_age);

    printf("Enter Female Age: ");

    scanf("%d", &female\_age);

    int eligible = 1;

    if (male\_age < 21)

    {

        printf("Male is NOT eligible for marriage.\n");

        eligible = 0;

    }

    else

    {

        printf("Male is eligible for marriage.\n");

    }

    if (female\_age < 18)

    {

        printf("Female is NOT eligible for marriage.\n");

        eligible = 0;

    }

    else

    {

        printf("Female is eligible for marriage.\n");

    }

    return eligible;

}

// ================= Assignment 2 =================

int assignment\_2()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 2 ----------------\n");

        printf("1) Item Price with Discount\n");

        printf("2) Greatest of Three Numbers\n");

        printf("3) Calculator with Operator\n");

        printf("4) Display Menu\n");

        printf("5) Check Student Discount\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        switch (ch)

        {

        case 1:

            item\_price\_with\_discount();

            break;

        case 2:

            find\_greatest\_of\_three();

            break;

        case 3:

            calculator\_with\_operator();

            break;

        case 4:

            display\_menu();

            break;

        case 5:

            check\_student\_discount();

            break;

        case 0:

            return 0;

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

    return 0;

}

int item\_price\_with\_discount()

{

    int price, discountRate, discount, finalPrice;

    printf("\nQ1. Price Item Discount\n");

    printf("Enter the price of the item: ");

    scanf("%d", &price);

    if (price <= 1000)

        discountRate = 5;

    else if (price <= 5000)

        discountRate = 10;

    else

        discountRate = 20;

    discount = (price \* discountRate) / 100;

    finalPrice = price - discount;

    printf("Discount: %d\n", discount);

    printf("Final Price after discount: %d\n", finalPrice);

    return finalPrice;

}

int find\_greatest\_of\_three()

{

    int a, b, c, greatest;

    printf("\nQ2. Greatest of Three Numbers\n");

    printf("Enter three numbers: ");

    scanf("%d %d %d", &a, &b, &c);

    if (a >= b && a >= c)

        greatest = a;

    else if (b >= c)

        greatest = b;

    else

        greatest = c;

    printf("Greatest number: %d\n", greatest);

    if (a == b && b == c)

        printf("All numbers are equal.\n");

    return greatest;

}

int calculator\_with\_operator()

{

    int num1, num2, result = 0;

    char op;

    printf("\nQ3. Calculator using Operator\n");

    printf("Enter two numbers: ");

    scanf("%d %d", &num1, &num2);

    printf("Enter an operator (+, -, \*, /, %%): ");

    scanf(" %c", &op);

    switch (op)

    {

    case '+':

        result = num1 + num2;

        printf("Result: %d\n", result);

        break;

    case '-':

        result = num1 - num2;

        printf("Result: %d\n", result);

        break;

    case '\*':

        result = num1 \* num2;

        printf("Result: %d\n", result);

        break;

    case '/':

        if (num2 != 0)

        {

            result = num1 / num2;

            printf("Result: %d\n", result);

        }

        else

        {

            printf("Error: Division by zero is not allowed.\n");

        }

        break;

    case '%':

        if (num2 != 0)

        {

            result = num1 % num2;

            printf("Result: %d\n", result);

        }

        else

        {

            printf("Error: Division by zero is not allowed.\n");

        }

        break;

    default:

        printf("Invalid operator!\n");

        break;

    }

    return result;

}

int display\_menu()

{

    int choice;

    printf("\nQ4. Menu: Even/Odd or Basic Salary\n");

    printf("1. Check Even/Odd\n2. Calculate Basic Salary\n");

    printf("Enter your choice: ");

    scanf("%d", &choice);

    if (choice == 1)

    {

        int number;

        printf("Enter a number: ");

        scanf("%d", &number);

        if (number % 2 == 0)

            printf("%d is Even.\n", number);

        else

            printf("%d is Odd.\n", number);

        return number;

    }

    else if (choice == 2)

    {

        double basic, hra, da, gross;

        printf("Enter Basic Salary: ");

        scanf("%lf", &basic);

        hra = 0.20 \* basic;

        da = 0.50 \* basic;

        gross = basic + hra + da;

        printf("Gross Salary: %.2lf\n", gross);

        return (int)gross;

    }

    else

    {

        printf("Invalid choice!\n");

    }

    return 0;

}

double check\_student\_discount()

{

    int price, isStudent;

    double discount = 0.0, finalPrice;

    printf("\nQ5. Student Discount\n");

    printf("Enter the total purchase amount: ");

    scanf("%d", &price);

    printf("Are you a student? (1 = Yes, 2 = No): ");

    scanf("%d", &isStudent);

    if (isStudent == 1)

    {

        if (price > 500)

        {

            discount = 0.20 \* price;

            printf("20%% student discount applied.\n");

        }

        else

        {

            discount = 0.10 \* price;

            printf("10%% student discount applied.\n");

        }

    }

    else if (isStudent == 2)

    {

        if (price > 600)

        {

            discount = 0.15 \* price;

            printf("15%% non-student discount applied.\n");

        }

        else

        {

            printf("No discount applicable.\n");

        }

    }

    else

    {

        printf("Invalid input for student status.\n");

        return price;

    }

    finalPrice = price - discount;

    printf("Final price after discount: %.2lf\n", finalPrice);

    return finalPrice;

}

// ================= Assignment 3 =================

void assignment\_3()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 3 ----------------\n");

        printf("1) Print 1 to 10\n");

        printf("2) Print Table for Number\n");

        printf("3) Sum in Range\n");

        printf("4) Check Prime Number\n");

        printf("5) Check Armstrong Number\n");

        printf("6) Check Perfect Number\n");

        printf("7) Factorial of Number\n");

        printf("8) Check Strong Number\n");

        printf("9) Check Palindrome Number\n");

        printf("10) Add First and Last Digits\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        switch (ch)

        {

        case 1:

            print\_1\_to\_10();

            break;

        case 2:

            print\_table\_for\_number();

            break;

        case 3:

            printf("Sum in range: %d\n", sum\_in\_range());

            break;

        case 4:

            if (check\_prime\_number())

                printf("It's a Prime Number.\n");

            else

                printf("It's not a Prime Number.\n");

            break;

        case 5:

            if (check\_armstrong\_number())

                printf("It's an Armstrong Number.\n");

            else

                printf("It's not an Armstrong Number.\n");

            break;

        case 6:

            if (check\_perfect\_number())

                printf("It's a Perfect Number.\n");

            else

                printf("It's not a Perfect Number.\n");

            break;

        case 7:

            printf("Factorial: %d\n", factorial\_of\_number());

            break;

        case 8:

            if (check\_strong\_number())

                printf("It's a Strong Number.\n");

            else

                printf("It's not a Strong Number.\n");

            break;

        case 9:

            if (check\_palindrome\_number())

                printf("It's a Palindrome Number.\n");

            else

                printf("It's not a Palindrome Number.\n");

            break;

        case 10:

            printf("Sum of first and last digits: %d\n", add\_first\_and\_last\_digits());

            break;

        case 0:

            return;

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

}

// Q1

void print\_1\_to\_10()

{

    printf("\nQ1. Numbers from 1 to 10:\n");

    for (int i = 1; i <= 10; i++)

    {

        printf("%d ", i);

    }

    printf("\n");

}

// Q2

void print\_table\_for\_number()

{

    int num;

    printf("\nQ2. Enter a number to print its table: ");

    scanf("%d", &num);

    for (int i = 1; i <= 10; i++)

    {

        printf("%d x %d = %d\n", num, i, num \* i);

    }

}

// Q3

int sum\_in\_range()

{

    int start, end, sum = 0;

    printf("\nQ3. Enter start and end range: ");

    scanf("%d %d", &start, &end);

    for (int i = start; i <= end; i++)

    {

        sum += i;

    }

    return sum;

}

// Q4

int check\_prime\_number()

{

    int num, isPrime = 1;

    printf("\nQ4. Enter a number to check if prime: ");

    scanf("%d", &num);

    if (num <= 1)

        return 0;

    for (int i = 2; i <= num / 2; i++)

    {

        if (num % i == 0)

            return 0;

    }

    return 1;

}

// Q5

int check\_armstrong\_number()

{

    int num, original, temp, digits = 0, sum = 0;

    printf("\nQ5. Enter a number to check Armstrong: ");

    scanf("%d", &num);

    original = num;

    temp = num;

    while (temp > 0)

    {

        temp /= 10;

        digits++;

    }

    temp = num;

    while (temp > 0)

    {

        int rem = temp % 10, power = 1;

        for (int i = 0; i < digits; i++)

        {

            power \*= rem;

        }

        sum += power;

        temp /= 10;

    }

    return (original == sum);

}

// Q6

int check\_perfect\_number()

{

    int num, sum = 0;

    printf("\nQ6. Enter a number to check Perfect: ");

    scanf("%d", &num);

    for (int i = 1; i <= num / 2; i++)

    {

        if (num % i == 0)

            sum += i;

    }

    return (sum == num);

}

// Q7

int factorial\_of\_number()

{

    int num, factorial = 1;

    printf("\nQ7. Enter a number to find factorial: ");

    scanf("%d", &num);

    for (int i = 1; i <= num; i++)

    {

        factorial \*= i;

    }

    return factorial;

}

// Q8

int check\_strong\_number()

{

    int num, original, sum = 0;

    printf("\nQ8. Enter a number to check Strong: ");

    scanf("%d", &num);

    original = num;

    while (num > 0)

    {

        int digit = num % 10, fact = 1;

        for (int i = 1; i <= digit; i++)

        {

            fact \*= i;

        }

        sum += fact;

        num /= 10;

    }

    return (sum == original);

}

// Q9

int check\_palindrome\_number()

{

    int num, original, reversed = 0;

    printf("\nQ9. Enter a number to check Palindrome: ");

    scanf("%d", &num);

    original = num;

    while (num > 0)

    {

        reversed = reversed \* 10 + (num % 10);

        num /= 10;

    }

    return (original == reversed);

}

// Q10

int add\_first\_and\_last\_digits()

{

    int num, firstDigit, lastDigit;

    printf("\nQ10. Enter a number to add first and last digit: ");

    scanf("%d", &num);

    lastDigit = num % 10;

    while (num >= 10)

    {

        num /= 10;

    }

    firstDigit = num;

    return firstDigit + lastDigit;

}

// ================= Assignment 4 =================

void assignment\_4()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 4 ----------------\n");

        printf("1) Prime Numbers in Range\n");

        printf("2) Armstrong Numbers in Range\n");

        printf("3) Perfect Numbers in Range\n");

        printf("4) Strong Numbers in Range\n");

        printf("5) Generate Fibonacci Series\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        switch (ch)

        {

        case 1:

            prime\_numbers\_in\_range();

            break;

        case 2:

            armstrong\_numbers\_in\_range();

            break;

        case 3:

            perfect\_numbers\_in\_range();

            break;

        case 4:

            strong\_numbers\_in\_range();

            break;

        case 5:

            generate\_fibonacci\_series();

            break;

        case 0:

            return;

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

}

// 1. Prime Numbers in Range

void prime\_numbers\_in\_range()

{

    int start = 1, end = 1000;

    printf("\nQ1. Prime numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        if (num < 2) continue;

        int is\_prime = 1;

        for (int i = 2; i \* i <= num; i++)

        {

            if (num % i == 0)

            {

                is\_prime = 0;

                break;

            }

        }

        if (is\_prime)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

// 2. Armstrong Numbers in Range

void armstrong\_numbers\_in\_range()

{

    int start = 1, end = 1000;

    printf("\nQ2. Armstrong numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        int original = num, sum = 0, digits = 0, temp = num;

        while (temp > 0)

        {

            temp /= 10;

            digits++;

        }

        temp = num;

        while (temp > 0)

        {

            int digit = temp % 10;

            sum += pow(digit, digits);

            temp /= 10;

        }

        if (sum == original)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

// 3. Perfect Numbers in Range

void perfect\_numbers\_in\_range()

{

    int start = 1, end = 1000;

    printf("\nQ3. Perfect numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        int sum = 0;

        for (int i = 1; i <= num / 2; i++)

        {

            if (num % i == 0)

            {

                sum += i;

            }

        }

        if (sum == num)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

// 4. Strong Numbers in Range

void strong\_numbers\_in\_range()

{

    int start = 1, end = 1000;

    printf("\nQ4. Strong numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        int original = num, sum = 0, temp = num;

        while (temp > 0)

        {

            int digit = temp % 10;

            int factorial = 1;

            for (int i = 1; i <= digit; i++)

            {

                factorial \*= i;

            }

            sum += factorial;

            temp /= 10;

        }

        if (sum == original)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

// 5. Fibonacci Series

void generate\_fibonacci\_series()

{

    int n = 10;

    int first = 0, second = 1;

    printf("\nQ5. First %d terms of Fibonacci Series:\n", n);

    for (int i = 0; i < n; i++)

    {

        printf("%d ", first);

        int next = first + second;

        first = second;

        second = next;

    }

    printf("\n--------------------------------\n");

}

**Function Type 3**

#include <stdio.h>

#include <stdlib.h>

#include <math.h>

// Assignment 1

void assignment\_1();

void fahrenheit\_to\_celsius(int celsius);

void find\_area\_and\_perimeter(int choice, int length, int width, int radius);

void input\_three\_digit\_number(int no);

void check\_even\_or\_odd(int no);

void calculate\_total\_salary(double basic);

void check\_marriage\_eligibility(int male\_age, int female\_age);

// Assignment 2

void assignment\_2();

void item\_price\_with\_discount(int price);

void find\_greatest\_of\_three(int a, int b, int c);

void calculator\_with\_operator(int num1, int num2, char op);

void display\_menu(int choice, int number, double basic);

void check\_student\_discount(int price, int isStudent);

// Assignment 3

void assignment\_3();

void print\_1\_to\_10();

void print\_table\_for\_number(int num);

void sum\_in\_range(int start, int end);

void check\_prime\_number(int num);

void check\_armstrong\_number(int num);

void check\_perfect\_number(int num);

void factorial\_of\_number(int num);

void check\_strong\_number(int num);

void check\_palindrome\_number(int num);

void add\_first\_and\_last\_digits(int num);

// Assignment 4

void assignment\_4();

void prime\_numbers\_in\_range(int start, int end);

void armstrong\_numbers\_in\_range(int start, int end);

void perfect\_numbers\_in\_range(int start, int end);

void strong\_numbers\_in\_range(int start, int end);

void generate\_fibonacci\_series(int n);

int main()

{

    int choice;

    while (1)

    {

        printf("\n================ MAIN MENU ================\n");

        printf("1) Assignment 1\n2) Assignment 2\n3) Assignment 3\n4) Assignment 4\n0) Exit\n");

        printf("Enter Your Assignment No: ");

        scanf("%d", &choice);

        switch (choice)

        {

        case 1:

            assignment\_1();

            break;

        case 2:

            assignment\_2();

            break;

        case 3:

            assignment\_3();

            break;

        case 4:

            assignment\_4();

            break;

        case 0:

            exit(0);

        default:

            printf("Invalid Choice. Try again.\n");

        }

    }

    return 0;

}

void assignment\_1()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 1 ----------------\n");

        printf("1) Celsius to Fahrenheit\n");

        printf("2) Area and Perimeter\n");

        printf("3) Input 3-digit number\n");

        printf("4) Even or Odd\n");

        printf("5) Total Salary Calculation\n");

        printf("6) Marriage Eligibility\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        int num, choice, length, width, radius;

        double basic;

        int male\_age, female\_age;

        switch (ch)

        {

        case 1:

            printf("Enter temperature in Celsius: ");

            scanf("%d", &num);

            fahrenheit\_to\_celsius(num);

            break;

        case 2:

            printf("1) Rectangle\n2) Circle\nEnter choice: ");

            scanf("%d", &choice);

            if (choice == 1)

            {

                printf("Enter length: ");

                scanf("%d", &length);

                printf("Enter width: ");

                scanf("%d", &width);

            }

            else if (choice == 2)

            {

                printf("Enter radius: ");

                scanf("%d", &radius);

            }

            find\_area\_and\_perimeter(choice, length, width, radius);

            break;

        case 3:

            printf("Enter a 3-digit number: ");

            scanf("%d", &num);

            input\_three\_digit\_number(num);

            break;

        case 4:

            printf("Enter a number: ");

            scanf("%d", &num);

            check\_even\_or\_odd(num);

            break;

        case 5:

            printf("Enter Basic Salary: ");

            scanf("%lf", &basic);

            calculate\_total\_salary(basic);

            break;

        case 6:

            printf("Enter Male Age: ");

            scanf("%d", &male\_age);

            printf("Enter Female Age: ");

            scanf("%d", &female\_age);

            check\_marriage\_eligibility(male\_age, female\_age);

            break;

        case 0:

            return;

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

}

// ================= Assignment 1 =================

void fahrenheit\_to\_celsius(int celsius)

{

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

    printf("Temperature in Fahrenheit: %d°F\n", fahrenheit);

}

void find\_area\_and\_perimeter(int choice, int length, int width, int radius)

{

    float area, perimeter;

    const float pi = 3.14f;

    if (choice == 1)

    {

        area = length \* width;

        perimeter = 2 \* (length + width);

        printf("Rectangle Area: %.2f\nRectangle Perimeter: %.2f\n", area, perimeter);

    }

    else if (choice == 2)

    {

        area = pi \* radius \* radius;

        perimeter = 2 \* pi \* radius;

        printf("Circle Area: %.2f\nCircle Perimeter: %.2f\n", area, perimeter);

    }

    else

    {

        printf("Invalid shape choice.\n");

    }

}

void input\_three\_digit\_number(int no)

{

    if (no >= 100 && no <= 999)

    {

        int n1 = no / 100;

        int n2 = (no / 10) % 10;

        int n3 = no % 10;

        int sum = n1 + n2 + n3;

        printf("Digits: %d, %d, %d\n", n1, n2, n3);

        printf("Sum of digits: %d\n", sum);

        printf("Reverse of number: %d%d%d\n", n3, n2, n1);

    }

    else

    {

        printf("Invalid input. Not a 3-digit number.\n");

    }

}

void check\_even\_or\_odd(int no)

{

    if (no % 2 == 0)

        printf("%d is Even\n", no);

    else

        printf("%d is Odd\n", no);

}

void calculate\_total\_salary(double basic)

{

    double da, ta, hra, totalSalary;

    if (basic <= 5000)

    {

        da = basic \* 0.10;

        ta = basic \* 0.20;

        hra = basic \* 0.25;

    }

    else

    {

        da = basic \* 0.15;

        ta = basic \* 0.25;

        hra = basic \* 0.30;

    }

    totalSalary = basic + da + ta + hra;

    printf("Total Salary = %.2lf\n", totalSalary);

}

void check\_marriage\_eligibility(int male\_age, int female\_age)

{

    if (male\_age >= 21)

        printf("Male is eligible for marriage.\n");

    else

        printf("Male is NOT eligible for marriage.\n");

    if (female\_age >= 18)

        printf("Female is eligible for marriage.\n");

    else

        printf("Female is NOT eligible for marriage.\n");

}

// ================= Assignment 2 =================

void assignment\_2()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 2 ----------------\n");

        printf("1) Item Price with Discount\n");

        printf("2) Greatest of Three Numbers\n");

        printf("3) Calculator with Operator\n");

        printf("4) Display Menu\n");

        printf("5) Check Student Discount\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        if (ch == 0)

            return;

        switch (ch)

        {

        case 1:

        {

            int price;

            printf("Enter the price of the item: ");

            scanf("%d", &price);

            item\_price\_with\_discount(price);

            break;

        }

        case 2:

        {

            int a, b, c;

            printf("Enter three numbers: ");

            scanf("%d %d %d", &a, &b, &c);

            find\_greatest\_of\_three(a, b, c);

            break;

        }

        case 3:

        {

            int num1, num2;

            char op;

            printf("Enter two numbers: ");

            scanf("%d %d", &num1, &num2);

            printf("Enter an operator (+, -, \*, /, %%): ");

            scanf(" %c", &op);

            calculator\_with\_operator(num1, num2, op);

            break;

        }

        case 4:

        {

            int choice, number = 0;

            double basic = 0;

            printf("1. Check Even/Odd\n2. Calculate Basic Salary\nEnter your choice: ");

            scanf("%d", &choice);

            if (choice == 1)

            {

                printf("Enter a number: ");

                scanf("%d", &number);

            }

            else if (choice == 2)

            {

                printf("Enter Basic Salary: ");

                scanf("%lf", &basic);

            }

            display\_menu(choice, number, basic);

            break;

        }

        case 5:

        {

            int price, isStudent;

            printf("Enter the total purchase amount: ");

            scanf("%d", &price);

            printf("Are you a student? (1 = Yes, 2 = No): ");

            scanf("%d", &isStudent);

            check\_student\_discount(price, isStudent);

            break;

        }

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

}

void item\_price\_with\_discount(int price)

{

    int discountRate, discount, finalPrice;

    if (price <= 1000)

        discountRate = 5;

    else if (price <= 5000)

        discountRate = 10;

    else

        discountRate = 20;

    discount = (price \* discountRate) / 100;

    finalPrice = price - discount;

    printf("Discount: %d\n", discount);

    printf("Final Price after discount: %d\n", finalPrice);

}

void find\_greatest\_of\_three(int a, int b, int c)

{

    if (a == b && b == c)

    {

        printf("All numbers are equal.\n");

        return;

    }

    if (a >= b && a >= c)

        printf("Greatest number: %d\n", a);

    else if (b >= c)

        printf("Greatest number: %d\n", b);

    else

        printf("Greatest number: %d\n", c);

}

void calculator\_with\_operator(int num1, int num2, char op)

{

    int result;

    switch (op)

    {

    case '+':

        result = num1 + num2;

        printf("Result: %d\n", result);

        break;

    case '-':

        result = num1 - num2;

        printf("Result: %d\n", result);

        break;

    case '\*':

        result = num1 \* num2;

        printf("Result: %d\n", result);

        break;

    case '/':

        if (num2 != 0)

            printf("Result: %d\n", num1 / num2);

        else

            printf("Error: Division by zero is not allowed.\n");

        break;

    case '%':

        if (num2 != 0)

            printf("Result: %d\n", num1 % num2);

        else

            printf("Error: Division by zero is not allowed.\n");

        break;

    default:

        printf("Invalid operator!\n");

    }

}

void display\_menu(int choice, int number, double basic)

{

    if (choice == 1)

    {

        if (number % 2 == 0)

            printf("%d is Even.\n", number);

        else

            printf("%d is Odd.\n", number);

    }

    else if (choice == 2)

    {

        double hra = 0.20 \* basic;

        double da = 0.50 \* basic;

        double gross = basic + hra + da;

        printf("Gross Salary: %.2lf\n", gross);

    }

    else

    {

        printf("Invalid choice!\n");

    }

}

void check\_student\_discount(int price, int isStudent)

{

    double discount = 0.0;

    if (isStudent == 1)

    {

        if (price > 500)

        {

            discount = 0.20 \* price;

            printf("20%% student discount applied.\n");

        }

        else

        {

            discount = 0.10 \* price;

            printf("10%% student discount applied.\n");

        }

    }

    else if (isStudent == 2)

    {

        if (price > 600)

        {

            discount = 0.15 \* price;

            printf("15%% non-student discount applied.\n");

        }

        else

        {

            printf("No discount applicable.\n");

        }

    }

    else

    {

        printf("Invalid input for student status.\n");

        return;

    }

    double finalPrice = price - discount;

    printf("Final price after discount: %.2lf\n", finalPrice);

}

// ================= Assignment 3 =================

void assignment\_3()

{

    int ch, num, start, end;

    while (1)

    {

        printf("\n---------------- Assignment 3 ----------------\n");

        printf("1) Print 1 to 10\n");

        printf("2) Print Table for Number\n");

        printf("3) Sum in Range\n");

        printf("4) Check Prime Number\n");

        printf("5) Check Armstrong Number\n");

        printf("6) Check Perfect Number\n");

        printf("7) Factorial of Number\n");

        printf("8) Check Strong Number\n");

        printf("9) Check Palindrome Number\n");

        printf("10) Add First and Last Digits\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        switch (ch)

        {

        case 1:

            print\_1\_to\_10(); // No input required

            break;

        case 2:

            printf("Enter a number: ");

            scanf("%d", &num);

            print\_table\_for\_number(num);

            break;

        case 3:

            printf("Enter start and end range: ");

            scanf("%d %d", &start, &end);

            sum\_in\_range(start, end);

            break;

        case 4:

            printf("Enter a number: ");

            scanf("%d", &num);

            check\_prime\_number(num);

            break;

        case 5:

            printf("Enter a number: ");

            scanf("%d", &num);

            check\_armstrong\_number(num);

            break;

        case 6:

            printf("Enter a number: ");

            scanf("%d", &num);

            check\_perfect\_number(num);

            break;

        case 7:

            printf("Enter a number: ");

            scanf("%d", &num);

            factorial\_of\_number(num);

            break;

        case 8:

            printf("Enter a number: ");

            scanf("%d", &num);

            check\_strong\_number(num);

            break;

        case 9:

            printf("Enter a number: ");

            scanf("%d", &num);

            check\_palindrome\_number(num);

            break;

        case 10:

            printf("Enter a number: ");

            scanf("%d", &num);

            add\_first\_and\_last\_digits(num);

            break;

        case 0:

            return;

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

}

void print\_1\_to\_10()

{

    printf("\nQ1. Numbers from 1 to 10:\n");

    for (int i = 1; i <= 10; i++)

    {

        printf("%d ", i);

    }

    printf("\n");

}

void print\_table\_for\_number(int num)

{

    printf("\nQ2. Table of %d:\n", num);

    for (int i = 1; i <= 10; i++)

    {

        printf("%d x %d = %d\n", num, i, num \* i);

    }

}

void sum\_in\_range(int start, int end)

{

    int sum = 0;

    for (int i = start; i <= end; i++)

    {

        sum += i;

    }

    printf("Sum from %d to %d is: %d\n", start, end, sum);

}

void check\_prime\_number(int num)

{

    int isPrime = 1;

    if (num <= 1)

    {

        isPrime = 0;

    }

    else

    {

        for (int i = 2; i <= num / 2; i++)

        {

            if (num % i == 0)

            {

                isPrime = 0;

                break;

            }

        }

    }

    if (isPrime)

        printf("%d is a Prime number.\n", num);

    else

        printf("%d is not a Prime number.\n", num);

}

void check\_armstrong\_number(int num)

{

    int original = num, temp = num, digits = 0, sum = 0;

    while (temp > 0)

    {

        temp /= 10;

        digits++;

    }

    temp = num;

    while (temp > 0)

    {

        int rem = temp % 10, power = 1;

        for (int i = 0; i < digits; i++)

        {

            power \*= rem;

        }

        sum += power;

        temp /= 10;

    }

    if (original == sum)

        printf("%d is an Armstrong number.\n", original);

    else

        printf("%d is not an Armstrong number.\n", original);

}

void check\_perfect\_number(int num)

{

    int sum = 0;

    for (int i = 1; i <= num / 2; i++)

    {

        if (num % i == 0)

            sum += i;

    }

    if (sum == num)

        printf("%d is a Perfect number.\n", num);

    else

        printf("%d is not a Perfect number.\n", num);

}

void factorial\_of\_number(int num)

{

    int factorial = 1;

    for (int i = 1; i <= num; i++)

    {

        factorial \*= i;

    }

    printf("Factorial of %d is %d\n", num, factorial);

}

void check\_strong\_number(int num)

{

    int original = num, sum = 0;

    while (num > 0)

    {

        int digit = num % 10, fact = 1;

        for (int i = 1; i <= digit; i++)

        {

            fact \*= i;

        }

        sum += fact;

        num /= 10;

    }

    if (sum == original)

        printf("%d is a Strong number.\n", original);

    else

        printf("%d is not a Strong number.\n", original);

}

void check\_palindrome\_number(int num)

{

    int original = num, reversed = 0;

    while (num > 0)

    {

        reversed = reversed \* 10 + (num % 10);

        num /= 10;

    }

    if (original == reversed)

        printf("%d is a Palindrome number.\n", original);

    else

        printf("%d is not a Palindrome number.\n", original);

}

void add\_first\_and\_last\_digits(int num)

{

    int lastDigit = num % 10, firstDigit = num;

    while (firstDigit >= 10)

    {

        firstDigit /= 10;

    }

    printf("Sum of first and last digit: %d + %d = %d\n", firstDigit, lastDigit, firstDigit + lastDigit);

}

// ================= Assignment 4 =================

void assignment\_4()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 4 ----------------\n");

        printf("1) Prime Numbers in Range\n");

        printf("2) Armstrong Numbers in Range\n");

        printf("3) Perfect Numbers in Range\n");

        printf("4) Strong Numbers in Range\n");

        printf("5) Generate Fibonacci Series\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        switch (ch)

        {

        case 1:

            prime\_numbers\_in\_range(1, 1000);

            break;

        case 2:

            armstrong\_numbers\_in\_range(1, 1000);

            break;

        case 3:

            perfect\_numbers\_in\_range(1, 1000);

            break;

        case 4:

            strong\_numbers\_in\_range(1, 1000);

            break;

        case 5:

            generate\_fibonacci\_series(10);

            break;

        case 0:

            return;

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

}

void prime\_numbers\_in\_range(int start, int end)

{

    printf("\nQ1. Prime numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        if (num < 2)

            continue;

        int is\_prime = 1;

        for (int i = 2; i \* i <= num; i++)

        {

            if (num % i == 0)

            {

                is\_prime = 0;

                break;

            }

        }

        if (is\_prime)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

void armstrong\_numbers\_in\_range(int start, int end)

{

    printf("\nQ2. Armstrong numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        int original = num, sum = 0, digits = 0, temp = num;

        while (temp > 0)

        {

            temp /= 10;

            digits++;

        }

        temp = num;

        while (temp > 0)

        {

            int digit = temp % 10;

            sum += pow(digit, digits);

            temp /= 10;

        }

        if (sum == original)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

void perfect\_numbers\_in\_range(int start, int end)

{

    printf("\nQ3. Perfect numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        int sum = 0;

        for (int i = 1; i <= num / 2; i++)

        {

            if (num % i == 0)

            {

                sum += i;

            }

        }

        if (sum == num)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

void strong\_numbers\_in\_range(int start, int end)

{

    printf("\nQ4. Strong numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        int original = num, sum = 0, temp = num;

        while (temp > 0)

        {

            int digit = temp % 10;

            int factorial = 1;

            for (int i = 1; i <= digit; i++)

            {

                factorial \*= i;

            }

            sum += factorial;

            temp /= 10;

        }

        if (sum == original)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

void generate\_fibonacci\_series(int n)

{

    int first = 0, second = 1;

    printf("\nQ5. First %d terms of Fibonacci Series:\n", n);

    for (int i = 0; i < n; i++)

    {

        printf("%d ", first);

        int next = first + second;

        first = second;

        second = next;

    }

    printf("\n--------------------------------\n");

}

**Function Type 4**

#include <stdio.h>

#include <stdlib.h>

// Assignment 1

void assignment\_1();

int fahrenheit\_to\_celsius(int celsius);

int find\_area\_and\_perimeter(int choice, int a, int b);

int input\_three\_digit\_number(int no);

int check\_even\_or\_odd(int no);

double calculate\_total\_salary(double basic);

int check\_marriage\_eligibility(int male\_age, int female\_age);

// Assignment 2

int assignment\_2();

void item\_price\_with\_discount(int price);

void find\_greatest\_of\_three(int a, int b, int c);

void calculator\_with\_operator(int num1, int num2, char op);

void display\_menu(int choice, int number, double basic);

void check\_student\_discount(int price, int isStudent);

// Assignment 3

void assignment\_3();

void print\_1\_to\_10();

void print\_table\_for\_number(int num);

void sum\_in\_range(int start, int end);

void check\_prime\_number(int num);

void check\_armstrong\_number(int num);

void check\_perfect\_number(int num);

void factorial\_of\_number(int num);

void check\_strong\_number(int num);

void check\_palindrome\_number(int num);

void add\_first\_and\_last\_digits(int num);

// Assignment 4

void assignment\_4();

void prime\_numbers\_in\_range(int start, int end);

void armstrong\_numbers\_in\_range(int start, int end);

void perfect\_numbers\_in\_range(int start, int end);

void strong\_numbers\_in\_range(int start, int end);

void generate\_fibonacci\_series(int n);

int main()

{

    int choice;

    while (1)

    {

        printf("\n================ MAIN MENU ================\n");

        printf("1) Assignment 1\n2) Assignment 2\n3) Assignment 3\n4) Assignment 4\n0) Exit\n");

        printf("Enter Your Assignment No: ");

        scanf("%d", &choice);

        switch (choice)

        {

        case 1:

            assignment\_1();

            break;

        case 2:

            assignment\_2();

            break;

        case 3:

            assignment\_3();

            break;

        case 4:

            assignment\_4();

            break;

        case 0:

            exit(0);

        default:

            printf("Invalid Choice. Try again.\n");

        }

    }

    return 0;

}

// Assignment 1

void assignment\_1()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 1 ----------------\n");

        printf("1) Celsius to Fahrenheit\n");

        printf("2) Area and Perimeter\n");

        printf("3) Input 3-digit number\n");

        printf("4) Even or Odd\n");

        printf("5) Total Salary Calculation\n");

        printf("6) Marriage Eligibility\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        int val1, val2, result;

        double basic, total;

        switch (ch)

        {

            case 1:

                printf("Enter temperature in Celsius: ");

                scanf("%d", &val1);

                result = fahrenheit\_to\_celsius(val1);

                printf("Temperature in Fahrenheit: %d°F\n", result);

                break;

            case 2:

                printf("1) Rectangle\n2) Circle\nEnter choice: ");

                scanf("%d", &val1);

                if (val1 == 1)

                {

                    printf("Enter length and width: ");

                    scanf("%d %d", &val2, &result);

                }

                else if (val1 == 2)

                {

                    printf("Enter radius: ");

                    scanf("%d", &val2);

                    result = 0;

                }

                else

                {

                    printf("Invalid shape choice.\n");

                    break;

                }

                find\_area\_and\_perimeter(val1, val2, result);

                break;

            case 3:

                printf("Enter a 3-digit number: ");

                scanf("%d", &val1);

                input\_three\_digit\_number(val1);

                break;

            case 4:

                printf("Enter a number: ");

                scanf("%d", &val1);

                check\_even\_or\_odd(val1);

                break;

            case 5:

                printf("Enter Basic Salary: ");

                scanf("%lf", &basic);

                total = calculate\_total\_salary(basic);

                printf("Total Salary = %.2lf\n", total);

                break;

            case 6:

                printf("Enter Male Age: ");

                scanf("%d", &val1);

                printf("Enter Female Age: ");

                scanf("%d", &val2);

                check\_marriage\_eligibility(val1, val2);

                break;

            case 0:

                return;

            default:

                printf("Invalid choice. Try again.\n");

        }

    }

    printf("\n-------------- End of Assignment 1 ------------\n");

}

int fahrenheit\_to\_celsius(int celsius)

{

    return (celsius \* 9 / 5) + 32;

}

int find\_area\_and\_perimeter(int choice, int a, int b)

{

    float area, perimeter;

    const float pi = 3.14f;

    if (choice == 1)

    {

        area = a \* b;

        perimeter = 2 \* (a + b);

        printf("Rectangle Area: %.2f\nRectangle Perimeter: %.2f\n", area, perimeter);

    }

    else if (choice == 2)

    {

        area = pi \* a \* a;

        perimeter = 2 \* pi \* a;

        printf("Circle Area: %.2f\nCircle Perimeter: %.2f\n", area, perimeter);

    }

    else

    {

        printf("Invalid choice.\n");

        return 0;

    }

    return 1;

}

int input\_three\_digit\_number(int no)

{

    int n1, n2, n3, sum;

    if (no >= 100 && no <= 999)

    {

        n1 = no / 100;

        n2 = (no / 10) % 10;

        n3 = no % 10;

        sum = n1 + n2 + n3;

        printf("Digits: %d, %d, %d\n", n1, n2, n3);

        printf("Sum of digits: %d\n", sum);

        printf("Reverse of number: %d%d%d\n", n3, n2, n1);

        return sum;

    }

    else

    {

        printf("Invalid input. Not a 3-digit number.\n");

        return -1;

    }

}

int check\_even\_or\_odd(int no)

{

    if (no % 2 == 0)

    {

        printf("%d is Even\n", no);

        return 1;

    }

    else

    {

        printf("%d is Odd\n", no);

        return 0;

    }

}

double calculate\_total\_salary(double basic)

{

    double da, ta, hra;

    if (basic <= 5000)

    {

        da = basic \* 0.10;

        ta = basic \* 0.20;

        hra = basic \* 0.25;

    }

    else

    {

        da = basic \* 0.15;

        ta = basic \* 0.25;

        hra = basic \* 0.30;

    }

    return basic + da + ta + hra;

}

int check\_marriage\_eligibility(int male\_age, int female\_age)

{

    int eligible = 1;

    if (male\_age < 21)

    {

        printf("Male is NOT eligible for marriage.\n");

        eligible = 0;

    }

    else

    {

        printf("Male is eligible for marriage.\n");

    }

    if (female\_age < 18)

    {

        printf("Female is NOT eligible for marriage.\n");

        eligible = 0;

    }

    else

    {

        printf("Female is eligible for marriage.\n");

    }

    return eligible;

}

// Assignment 2

int assignment\_2()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 2 ----------------\n");

        printf("1) Item Price with Discount\n");

        printf("2) Greatest of Three Numbers\n");

        printf("3) Calculator with Operator\n");

        printf("4) Display Menu\n");

        printf("5) Check Student Discount\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        if (ch == 0) break;

        switch (ch)

        {

        case 1: {

            int price;

            printf("Enter the price of the item: ");

            scanf("%d", &price);

            item\_price\_with\_discount(price);

            break;

        }

        case 2: {

            int a, b, c;

            printf("Enter three numbers: ");

            scanf("%d %d %d", &a, &b, &c);

            find\_greatest\_of\_three(a, b, c);

            break;

        }

        case 3: {

            int num1, num2;

            char op;

            printf("Enter two numbers: ");

            scanf("%d %d", &num1, &num2);

            printf("Enter an operator (+, -, \*, /, %%): ");

            scanf(" %c", &op);

            calculator\_with\_operator(num1, num2, op);

            break;

        }

        case 4: {

            int choice, number = 0;

            double basic = 0;

            printf("1. Check Even/Odd\n2. Calculate Basic Salary\n");

            printf("Enter your choice: ");

            scanf("%d", &choice);

            if (choice == 1) {

                printf("Enter a number: ");

                scanf("%d", &number);

            } else if (choice == 2) {

                printf("Enter Basic Salary: ");

                scanf("%lf", &basic);

            }

            display\_menu(choice, number, basic);

            break;

        }

        case 5: {

            int price, isStudent;

            printf("Enter the total purchase amount: ");

            scanf("%d", &price);

            printf("Are you a student? (1 = Yes, 2 = No): ");

            scanf("%d", &isStudent);

            check\_student\_discount(price, isStudent);

            break;

        }

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

    return 0;

}

void item\_price\_with\_discount(int price)

{

    int discountRate, discount, finalPrice;

    printf("\nQ1. Price Item Discount\n");

    if (price <= 1000)

        discountRate = 5;

    else if (price <= 5000)

        discountRate = 10;

    else

        discountRate = 20;

    discount = (price \* discountRate) / 100;

    finalPrice = price - discount;

    printf("Discount: %d\n", discount);

    printf("Final Price after discount: %d\n", finalPrice);

}

void find\_greatest\_of\_three(int a, int b, int c)

{

    int greatest;

    printf("\nQ2. Greatest of Three Numbers\n");

    if (a >= b && a >= c)

        greatest = a;

    else if (b >= c)

        greatest = b;

    else

        greatest = c;

    printf("Greatest number: %d\n", greatest);

    if (a == b && b == c)

        printf("All numbers are equal.\n");

}

void calculator\_with\_operator(int num1, int num2, char op)

{

    int result;

    printf("\nQ3. Calculator using Operator\n");

    switch (op)

    {

    case '+':

        result = num1 + num2;

        printf("Result: %d\n", result);

        break;

    case '-':

        result = num1 - num2;

        printf("Result: %d\n", result);

        break;

    case '\*':

        result = num1 \* num2;

        printf("Result: %d\n", result);

        break;

    case '/':

        if (num2 != 0)

            printf("Result: %d\n", num1 / num2);

        else

            printf("Error: Division by zero is not allowed.\n");

        break;

    case '%':

        if (num2 != 0)

            printf("Result: %d\n", num1 % num2);

        else

            printf("Error: Division by zero is not allowed.\n");

        break;

    default:

        printf("Invalid operator!\n");

    }

}

void display\_menu(int choice, int number, double basic)

{

    printf("\nQ4. Menu: Even/Odd or Basic Salary\n");

    if (choice == 1)

    {

        if (number % 2 == 0)

            printf("%d is Even.\n", number);

        else

            printf("%d is Odd.\n", number);

    }

    else if (choice == 2)

    {

        double hra = 0.20 \* basic;

        double da = 0.50 \* basic;

        double gross = basic + hra + da;

        printf("Gross Salary: %.2lf\n", gross);

    }

    else

    {

        printf("Invalid choice!\n");

    }

}

void check\_student\_discount(int price, int isStudent)

{

    double discount = 0.0, finalPrice;

    printf("\nQ5. Student Discount\n");

    if (isStudent == 1)

    {

        if (price > 500)

        {

            discount = 0.20 \* price;

            printf("20%% student discount applied.\n");

        }

        else

        {

            discount = 0.10 \* price;

            printf("10%% student discount applied.\n");

        }

    }

    else if (isStudent == 2)

    {

        if (price > 600)

        {

            discount = 0.15 \* price;

            printf("15%% non-student discount applied.\n");

        }

        else

        {

            printf("No discount applicable.\n");

        }

    }

    else

    {

        printf("Invalid input for student status.\n");

        return;

    }

    finalPrice = price - discount;

    printf("Final price after discount: %.2lf\n", finalPrice);

}

// Assignment 3

void assignment\_3()

{

    int ch, num, start, end;

    while (1)

    {

        printf("\n---------------- Assignment 3 ----------------\n");

        printf("1) Print 1 to 10\n");

        printf("2) Print Table for Number\n");

        printf("3) Sum in Range\n");

        printf("4) Check Prime Number\n");

        printf("5) Check Armstrong Number\n");

        printf("6) Check Perfect Number\n");

        printf("7) Factorial of Number\n");

        printf("8) Check Strong Number\n");

        printf("9) Check Palindrome Number\n");

        printf("10) Add First and Last Digits\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        switch (ch)

        {

        case 1:

            print\_1\_to\_10();

            break;

        case 2:

            printf("Enter a number: ");

            scanf("%d", &num);

            print\_table\_for\_number(num);

            break;

        case 3:

            printf("Enter start and end range: ");

            scanf("%d %d", &start, &end);

            sum\_in\_range(start, end);

            break;

        case 4:

            printf("Enter a number: ");

            scanf("%d", &num);

            check\_prime\_number(num);

            break;

        case 5:

            printf("Enter a number: ");

            scanf("%d", &num);

            check\_armstrong\_number(num);

            break;

        case 6:

            printf("Enter a number: ");

            scanf("%d", &num);

            check\_perfect\_number(num);

            break;

        case 7:

            printf("Enter a number: ");

            scanf("%d", &num);

            factorial\_of\_number(num);

            break;

        case 8:

            printf("Enter a number: ");

            scanf("%d", &num);

            check\_strong\_number(num);

            break;

        case 9:

            printf("Enter a number: ");

            scanf("%d", &num);

            check\_palindrome\_number(num);

            break;

        case 10:

            printf("Enter a number: ");

            scanf("%d", &num);

            add\_first\_and\_last\_digits(num);

            break;

        case 0:

            return;

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

}

// Q1

void print\_1\_to\_10()

{

    printf("\nQ1. Numbers from 1 to 10:\n");

    for (int i = 1; i <= 10; i++)

    {

        printf("%d ", i);

    }

    printf("\n");

}

// Q2

void print\_table\_for\_number(int num)

{

    printf("\nQ2. Table for %d:\n", num);

    for (int i = 1; i <= 10; i++)

    {

        printf("%d x %d = %d\n", num, i, num \* i);

    }

}

// Q3

void sum\_in\_range(int start, int end)

{

    int sum = 0;

    for (int i = start; i <= end; i++)

    {

        sum += i;

    }

    printf("\nQ3. Sum from %d to %d = %d\n", start, end, sum);

}

// Q4

void check\_prime\_number(int num)

{

    if (num <= 1)

    {

        printf("Q4. Not a Prime Number.\n");

        return;

    }

    for (int i = 2; i <= num / 2; i++)

    {

        if (num % i == 0)

        {

            printf("Q4. Not a Prime Number.\n");

            return;

        }

    }

    printf("Q4. It's a Prime Number.\n");

}

// Q5

void check\_armstrong\_number(int num)

{

    int original = num, temp = num, digits = 0, sum = 0;

    while (temp > 0)

    {

        digits++;

        temp /= 10;

    }

    temp = num;

    while (temp > 0)

    {

        int rem = temp % 10, power = 1;

        for (int i = 0; i < digits; i++)

        {

            power \*= rem;

        }

        sum += power;

        temp /= 10;

    }

    if (sum == original)

        printf("Q5. It's an Armstrong Number.\n");

    else

        printf("Q5. It's not an Armstrong Number.\n");

}

// Q6

void check\_perfect\_number(int num)

{

    int sum = 0;

    for (int i = 1; i <= num / 2; i++)

    {

        if (num % i == 0)

            sum += i;

    }

    if (sum == num)

        printf("Q6. It's a Perfect Number.\n");

    else

        printf("Q6. It's not a Perfect Number.\n");

}

// Q7

void factorial\_of\_number(int num)

{

    int factorial = 1;

    for (int i = 1; i <= num; i++)

    {

        factorial \*= i;

    }

    printf("Q7. Factorial of %d = %d\n", num, factorial);

}

// Q8

void check\_strong\_number(int num)

{

    int original = num, sum = 0;

    while (num > 0)

    {

        int digit = num % 10, fact = 1;

        for (int i = 1; i <= digit; i++)

        {

            fact \*= i;

        }

        sum += fact;

        num /= 10;

    }

    if (sum == original)

        printf("Q8. It's a Strong Number.\n");

    else

        printf("Q8. It's not a Strong Number.\n");

}

// Q9

void check\_palindrome\_number(int num)

{

    int original = num, reversed = 0;

    while (num > 0)

    {

        reversed = reversed \* 10 + (num % 10);

        num /= 10;

    }

    if (original == reversed)

        printf("Q9. It's a Palindrome Number.\n");

    else

        printf("Q9. It's not a Palindrome Number.\n");

}

// Q10

void add\_first\_and\_last\_digits(int num)

{

    int lastDigit = num % 10;

    while (num >= 10)

    {

        num /= 10;

    }

    int firstDigit = num;

    printf("Q10. Sum of first and last digits = %d\n", firstDigit + lastDigit);

}

// Assignment 4

void assignment\_4()

{

    int ch;

    while (1)

    {

        printf("\n---------------- Assignment 4 ----------------\n");

        printf("1) Prime Numbers in Range\n");

        printf("2) Armstrong Numbers in Range\n");

        printf("3) Perfect Numbers in Range\n");

        printf("4) Strong Numbers in Range\n");

        printf("5) Generate Fibonacci Series\n");

        printf("0) Back to Main Menu\n");

        printf("Enter your choice: ");

        scanf("%d", &ch);

        switch (ch)

        {

        case 1:

            prime\_numbers\_in\_range(1, 1000);

            break;

        case 2:

            armstrong\_numbers\_in\_range(1, 1000);

            break;

        case 3:

            perfect\_numbers\_in\_range(1, 1000);

            break;

        case 4:

            strong\_numbers\_in\_range(1, 1000);

            break;

        case 5:

            generate\_fibonacci\_series(10);

            break;

        case 0:

            return;

        default:

            printf("Invalid choice. Try again.\n");

        }

    }

}

// Q1. Prime Numbers in Range

void prime\_numbers\_in\_range(int start, int end)

{

    printf("\nQ1. Prime numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        if (num < 2)

            continue;

        int is\_prime = 1;

        for (int i = 2; i \* i <= num; i++)

        {

            if (num % i == 0)

            {

                is\_prime = 0;

                break;

            }

        }

        if (is\_prime)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

// Q2. Armstrong Numbers in Range

void armstrong\_numbers\_in\_range(int start, int end)

{

    printf("\nQ2. Armstrong numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        int original = num, sum = 0, digits = 0, temp = num;

        while (temp > 0)

        {

            temp /= 10;

            digits++;

        }

        temp = num;

        while (temp > 0)

        {

            int digit = temp % 10;

            sum += pow(digit, digits);

            temp /= 10;

        }

        if (sum == original)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

// Q3. Perfect Numbers in Range

void perfect\_numbers\_in\_range(int start, int end)

{

    printf("\nQ3. Perfect numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        int sum = 0;

        for (int i = 1; i <= num / 2; i++)

        {

            if (num % i == 0)

            {

                sum += i;

            }

        }

        if (sum == num)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

// Q4. Strong Numbers in Range

void strong\_numbers\_in\_range(int start, int end)

{

    printf("\nQ4. Strong numbers between %d and %d:\n", start, end);

    for (int num = start; num <= end; num++)

    {

        int original = num, sum = 0, temp = num;

        while (temp > 0)

        {

            int digit = temp % 10;

            int factorial = 1;

            for (int i = 1; i <= digit; i++)

            {

                factorial \*= i;

            }

            sum += factorial;

            temp /= 10;

        }

        if (sum == original)

        {

            printf("%d ", num);

        }

    }

    printf("\n--------------------------------\n");

}

// Q5. Fibonacci Series

void generate\_fibonacci\_series(int n)

{

    int first = 0, second = 1;

    printf("\nQ5. First %d terms of Fibonacci Series:\n", n);

    for (int i = 0; i < n; i++)

    {

        printf("%d ", first);

        int next = first + second;

        first = second;

        second = next;

    }

    printf("\n--------------------------------\n");

}