A 1 - #include <stdio.h>

```
void HelloWorld();

int main() {

    HelloWorld();
    return 0;
}


void HelloWorld() {
    printf("Hello, World!\n");
}
```

A 2 - #include <stdio.h>

```
void add() {
    int a, b;
    printf("Enter two numbers to add: ");
    scanf("%d %d", &a, &b);
    printf("Result: %d\n", a + b);
}

void sub() {
    int a, b;
    printf("Enter two numbers to subtract: ");
    scanf("%d %d", &a, &b);
    printf("Result: %d\n", a - b);
}

void divi() {
    int a, b;
    printf("Enter two numbers to divide: ");
    scanf("%d %d", &a, &b);
    if (b != 0) {
        printf("Result: %d\n", a / b);
    } else {
        printf("Error: Can't divide by zero.\n");
    }
}
```

```
void mod() {
    int a, b;
    printf("Enter two numbers to find modulus: ");
    scanf("%d %d", &a, &b);
    if (b != 0) {
        printf("Result: %d\n", a % b);
    } else {
        printf("Error: Can't divide by zero.\n");
    }
}

void multi() {
    int a, b;
    printf("Enter two numbers to multiply: ");
    scanf("%d %d", &a, &b);
    printf("Result: %d\n", a * b);
}

int main() {
    int choice;

    while (1) {
        printf("\nChoose an operation:\n");
        printf("1. Add\n");
        printf("2. Subtract\n");
        printf("3. Divide\n");
        printf("4. Modulus\n");
        printf("5. Multiply\n");
        printf("6. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);

        if (choice == 1) {
            add();
        } else if (choice == 2) {
            sub();
        } else if (choice == 3) {
            divi();
        } else if (choice == 4) {
            mod();
        } else if (choice == 5) {
            multi();
```

```
        } else if (choice == 6) {
            printf("Exiting...\n");
            break;
        } else {
            printf("Invalid choice. Try again.\n");
        }
    }

    return 0;
}
```

A 3 -

```
#include <stdio.h>


void swap() {
    int a, b, temp;
    printf("Enter two numbers to swap: ");
    scanf("%d %d", &a, &b);
    temp = a;
    a = b;
    b = temp;
    printf("After swapping: a = %d, b = %d\n", a, b);
}


void even() {
    int num;
    printf("Enter a number to check if it's even: ");
    scanf("%d", &num);
    if (num % 2 == 0) {
        printf("%d is even.\n", num);
    } else {
        printf("%d is odd.\n", num);
    }
}


void marksheet() {
    char name[50];
    int marks[5], total = 0;
    float average;
```

```
    printf("Enter student's name: ");
    scanf("%s", name);
    printf("Enter marks for 5 subjects: ");
    for (int i = 0; i < 5; i++) {
        scanf("%d", &marks[i]);
        total += marks[i];
    }
    average = total / 5.0;

    printf("Marksheet for %s:\n", name);
    printf("Marks: ");
    for (int i = 0; i < 5; i++) {
        printf("%d ", marks[i]);
    }
    printf("\nTotal Marks: %d\n", total);
    printf("Average Marks: %.2f\n", average);
}


void electricity() {
    int units;
    float bill;

    printf("Enter the number of units consumed: ");
    scanf("%d", &units);

    if (units <= 100) {
        bill = units * 1.5;
    } else if (units <= 200) {
        bill = 100 * 1.5 + (units - 100) * 2.0;
    } else {
        bill = 100 * 1.5 + 100 * 2.0 + (units - 200) *
    3.0; }

    printf("Electricity bill: %.2f\n", bill);
}


void week() {
    int day;
    printf("Enter a number (1-7) to get the day of the week: ");
```

```
    scanf("%d", &day);

    if (day == 1) {
        printf("Sunday\n");
    } else if (day == 2) {
        printf("Monday\n");
    } else if (day == 3) {
        printf("Tuesday\n");
    } else if (day == 4) {
        printf("Wednesday\n");
    } else if (day == 5) {
        printf("Thursday\n");
    } else if (day == 6) {
        printf("Friday\n");
    } else if (day == 7) {
        printf("Saturday\n");
    } else {
        printf("Invalid number. Please enter a number between 1 and 7.\n");
    }
}


void month() {
    int month;
    printf("Enter a number (1-12) to get the month: ");
    scanf("%d", &month);

    if (month == 1) {
        printf("January\n");
    } else if (month == 2) {
        printf("February\n");
    } else if (month == 3) {
        printf("March\n");
    } else if (month == 4) {
        printf("April\n");
    } else if (month == 5) {
        printf("May\n");
    } else if (month == 6) {
        printf("June\n");
    } else if (month == 7) {
        printf("July\n");
    } else if (month == 8) {
```

```
        printf("August\n");
    } else if (month == 9) {
        printf("September\n");
    } else if (month == 10) {
        printf("October\n");
    } else if (month == 11) {
        printf("November\n");
    } else if (month == 12) {
        printf("December\n");
    } else {
        printf("Invalid number. Please enter a number between 1 and
    12.\n"); }
}

int main() {
    int choice;

    while (1) {
        printf("\nChoose an operation:\n");
        printf("1. Swap\n");
        printf("2. Even\n");
        printf("3. Marksheet\n");
        printf("4. Electricity\n");
        printf("5. Week\n");
        printf("6. Month\n");
        printf("7. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);

        if (choice == 1) {
            swap();
        } else if (choice == 2) {
            even();
        } else if (choice == 3) {
            marksheet();
        } else if (choice == 4) {
            electricity();
        } else if (choice == 5) {
            week();
        } else if (choice == 6) {
            month();
        } else if (choice == 7) {
```

```
            printf("Exiting...\n");
            break;
        } else {
            printf("Invalid choice. Try again.\n");
        }
    }

    return 0;
}
```

A 4 -

```
#include <stdio.h>


void palindrome() {
    int num, reversed = 0, remainder, original;
    printf("Enter a number to check if it's a palindrome: ");
    scanf("%d", &num);
    original = num;
    while (num != 0) {
        remainder = num % 10;
        reversed = reversed * 10 + remainder;
        num /= 10;
    }
    if (original == reversed) {
        printf("%d is a palindrome.\n", original);
    } else {
        printf("%d is not a palindrome.\n", original);
    }
}


void vowel() {
    char c;
    printf("Enter a character to check if it's a vowel: ");
    scanf(" %c", &c);
    if (c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u' || c
        == 'A' || c == 'E' || c == 'I' || c == 'O' || c == 'U') {
        printf("%c is a vowel.\n", c);
    } else {
        printf("%c is not a vowel.\n", c);
    }
}
```

```
void armstrong() {
    int num, original, remainder, result = 0, n = 0, temp;
    printf("Enter a number to check if it's an Armstrong number: ");
    scanf("%d", &num);
    original = num;
    while (original != 0) {
        original /= 10;
        ++n;
    }
    original = num;
    while (original != 0) {
        remainder = original % 10;
        temp = 1;
        for (int i = 0; i < n; ++i) {
            temp *= remainder;
        }
        result += temp;
        original /= 10;
    }
    if (result == num) {
        printf("%d is an Armstrong number.\n",
    num); } else {
        printf("%d is not an Armstrong number.\n", num);
    }
}


void reverse_number() {
    int num, reversed = 0, remainder;
    printf("Enter a number to reverse: ");
    scanf("%d", &num);
    while (num != 0) {
        remainder = num % 10;
        reversed = reversed * 10 + remainder;
        num /= 10;
    }
    printf("Reversed number: %d\n", reversed);
}
```

```
void sum_of_digits() {
    int num, sum = 0, remainder;
    printf("Enter a number to find the sum of its digits: ");
    scanf("%d", &num);
    while (num != 0) {
        remainder = num % 10;
        sum += remainder;
        num /= 10;
    }
    printf("Sum of digits: %d\n", sum);
}


void count_digits() {
    int num, count = 0;
    printf("Enter a number to count its digits: ");
    scanf("%d", &num);
    while (num != 0) {
        num /= 10;
        ++count;
    }
    printf("Number of digits: %d\n", count);
}


void calculator() {
    char operator;
    double num1, num2;
    printf("Enter an operator (+, -, *, /): ");
    scanf(" %c", &operator);
    printf("Enter two operands: ");
    scanf("%lf %lf", &num1, &num2);
    if (operator == '+') {
        printf("%.2lf + %.2lf = %.2lf\n", num1, num2, num1 + num2);
    } else if (operator == '-') {
        printf("%.2lf - %.2lf = %.2lf\n", num1, num2, num1 -
    num2); } else if (operator == '*') {
        printf("%.2lf * %.2lf = %.2lf\n", num1, num2, num1 * num2);
    } else if (operator == '/') {
        if (num2 != 0.0) {
```

```
            printf("%.2lf / %.2lf = %.2lf\n", num1, num2, num1 / num2);
        } else {
            printf("Error: Division by zero is not allowed.\n");
        }
    } else {
        printf("Invalid operator.\n");
    }
}


void fibonacci() {
    int n, t1 = 0, t2 = 1, nextTerm;
    printf("Enter the number of terms for Fibonacci series: ");
    scanf("%d", &n);
    printf("Fibonacci Series: %d, %d", t1, t2);
    nextTerm = t1 + t2;
    for (int i = 3; i <= n; ++i) {
        printf(", %d", nextTerm);
        t1 = t2;
        t2 = nextTerm;
        nextTerm = t1 + t2;
    }
    printf("\n");
}


void factorial() {
    int num;
    unsigned long long fact = 1;
    printf("Enter a number to find its factorial: ");
    scanf("%d", &num);
    for (int i = 1; i <= num; ++i) {
        fact *= i;
    }
    printf("Factorial of %d = %llu\n", num, fact);
}


void three_number_maximum() {
    int a, b, c;
    printf("Enter three numbers to find the maximum: ");
    scanf("%d %d %d", &a, &b, &c);
```

```
    if (a >= b && a >= c) {
        printf("Maximum: %d\n", a);
    } else if (b >= a && b >= c) {
        printf("Maximum: %d\n", b);
    } else {
        printf("Maximum: %d\n", c);
    }
}

int main() {
    char choice;

    while (1) {
        printf("\nChoose an operation:\n");
        printf("p: Palindrome\n");
        printf("v: Vowel\n");
        printf("a: Armstrong\n");
        printf("r: Reverse Number\n");
        printf("s: Sum of Digits\n");
        printf("c: Count Digits\n");
        printf("l: Calculator\n");
        printf("f: Fibonacci\n");
        printf("i: Factorial\n");
        printf("t: Three Number Maximum\n");
        printf("q: Quit\n");
        printf("Enter your choice: ");
        scanf(" %c", &choice);

        if (choice == 'p') {
            palindrome();
        } else if (choice == 'v') {
            vowel();
        } else if (choice == 'a') {
            armstrong();
        } else if (choice == 'r') {
            reverse_number();
        } else if (choice == 's') {
            sum_of_digits();
        } else if (choice == 'c') {
            count_digits();
        } else if (choice == 'l') {
            calculator();
```

```
        } else if (choice == 'f') {
            fibonacci();
        } else if (choice == 'i') {
            factorial();
        } else if (choice == 't') {
            three_number_maximum();
        } else if (choice == 'q') {
            printf("Exiting...\n");
            break;
        } else {
            printf("Invalid choice. Try
        again.\n"); }
    }

    return 0;
}
```

A 5 -

```
#include <stdio.h>


void add(int a, int b) {
    printf("Result: %d\n", a + b);
}


void sub(int a, int b) {
    printf("Result: %d\n", a - b);
}


void divi(int a, int b) {
    if (b != 0) {
        printf("Result: %d\n", a / b);
    } else {
        printf("Error: Division by zero is not allowed.\n");
    }
}


void mod(int a, int b) {
    if (b != 0) {
        printf("Result: %d\n", a % b);
```

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


void multi(int a, int b) {
    printf("Result: %d\n", a * b);
}

int main() {
    int x = 10, y = 5;

    printf("With Arguments:\n");
    add(x, y);
    sub(x, y);
    divi(x, y);
    mod(x, y);
    multi(x, y);

    return 0;
}
```

A 6 -

```
#include <stdio.h>
void swap(int a, int b) {
    int temp;
    temp = a;
    a = b;
    b = temp;
    printf("After swapping: a = %d, b = %d\n", a, b);
}


void even(int num) {
    if (num % 2 == 0) {
        printf("%d is even.\n", num);
    } else {
        printf("%d is odd.\n", num);
    }
}
```

```
void marksheet(char name[], int marks[], int num_subjects) {
    int total = 0;
    float average;

    for (int i = 0; i < num_subjects; i++) {
        total += marks[i];
    }
    average = total / (float)num_subjects;

    printf("Marksheet for %s:\n", name);
    printf("Marks: ");
    for (int i = 0; i < num_subjects; i++) {
        printf("%d ", marks[i]);
    }
    printf("\nTotal Marks: %d\n", total);
    printf("Average Marks: %.2f\n", average);
}


void electricity(int units) {
    float bill;

    if (units <= 100) {
        bill = units * 1.5;
    } else if (units <= 200) {
        bill = 100 * 1.5 + (units - 100) * 2.0;
    } else {
        bill = 100 * 1.5 + 100 * 2.0 + (units - 200) * 3.0;
    }

    printf("Electricity bill: %.2f\n", bill);
}


void week(int day) {
    if (day == 1) {
        printf("Sunday\n");
    } else if (day == 2) {
        printf("Monday\n");
    } else if (day == 3) {
```

```
        printf("Tuesday\n");
    } else if (day == 4) {
        printf("Wednesday\n");
    } else if (day == 5) {
        printf("Thursday\n");
    } else if (day == 6) {
        printf("Friday\n");
    } else if (day == 7) {
        printf("Saturday\n");
    } else {
        printf("Invalid number. Please enter a number between 1 and 7.\n");
    }
}


void month(int month) {
    if (month == 1) {
        printf("January\n");
    } else if (month == 2) {
        printf("February\n");
    } else if (month == 3) {
        printf("March\n");
    } else if (month == 4) {
        printf("April\n");
    } else if (month == 5) {
        printf("May\n");
    } else if (month == 6) {
        printf("June\n");
    } else if (month == 7) {
        printf("July\n");
    } else if (month == 8) {
        printf("August\n");
    } else if (month == 9) {
        printf("September\n");
    } else if (month == 10) {
        printf("October\n");
    } else if (month == 11) {
        printf("November\n");
    } else if (month == 12) {
        printf("December\n");
    } else {
        printf("Invalid number. Please enter a number between 1 and
```

```
    12.\n"); }
}

int main() {
    int a = 5, b = 10;
    int num = 4;
    char name[] = "Alice";
    int marks[] = {85, 90, 78, 92, 88};
    int units = 250;
    int day = 3;
    int month_num = 5;


    printf("Swap function:\n");
    swap(a, b);

    printf("\nEven function:\n");
    even(num);

    printf("\nMarksheet function:\n");
    marksheet(name, marks, 5);

    printf("\nElectricity function:\n");
    electricity(units);

    printf("\nWeek function:\n");
    week(day);

    printf("\nMonth function:\n");
    month(month_num);
    return 0;
}
```

A 7 -

```
#include <stdio.h>>

void palindrome(int num) {
    int original = num, reversed = 0, remainder;
    while (num != 0) {
        remainder = num % 10;
        reversed = reversed * 10 + remainder;
        num /= 10;
    }
    if (original == reversed) {
```

```
        printf("%d is a palindrome.\n", original);
    } else {
        printf("%d is not a palindrome.\n",
    original); }
}


void vowel(char c) {
    c = tolower(c);
    if (c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u') {
        printf("%c is a vowel.\n", c);
    } else {
        printf("%c is not a vowel.\n", c);
    }
}


void armstrong(int num) {
    int original = num, remainder, result = 0, n = 0, temp;
    while (original != 0) {
        original /= 10;
        n++;
    }
    original = num;
    while (original != 0) {
        remainder = original % 10;
        temp = 1;
        for (int i = 0; i < n; i++) {
            temp *= remainder;
        }
        result += temp;
        original /= 10;
    }
    if (result == num) {
        printf("%d is an Armstrong number.\n",
    num); } else {
        printf("%d is not an Armstrong number.\n", num);
    }
}


void reverse_number(int num) {
```

```
    int reversed = 0, remainder;
    while (num != 0) {
        remainder = num % 10;
        reversed = reversed * 10 + remainder;
        num /= 10;
    }
    printf("Reversed number: %d\n", reversed);
}


void sum_of_digits(int num) {
    int sum = 0, remainder;
    while (num != 0) {
        remainder = num % 10;
        sum += remainder;
        num /= 10;
    }
    printf("Sum of digits: %d\n", sum);
}


void count_digits(int num) {
    int count = 0;
    while (num != 0) {
        num /= 10;
        count++;
    }
    printf("Number of digits: %d\n", count);
}


void calculator(char operator, double num1, double num2) {
    if (operator == '+') {
        printf("%.2lf + %.2lf = %.2lf\n", num1, num2, num1 + num2);
    } else if (operator == '-') {
        printf("%.2lf - %.2lf = %.2lf\n", num1, num2, num1 -
    num2); } else if (operator == '*') {
        printf("%.2lf * %.2lf = %.2lf\n", num1, num2, num1 * num2);
    } else if (operator == '/') {
        if (num2 != 0.0) {
            printf("%.2lf / %.2lf = %.2lf\n", num1, num2, num1 / num2);
        } else {
```

```
            printf("Error: Division by zero is not allowed.\n");
        }
    } else {
        printf("Invalid operator.\n");
    }
}


void fibonacci(int n) {
    int t1 = 0, t2 = 1, nextTerm;
    printf("Fibonacci Series: %d, %d", t1, t2);
    nextTerm = t1 + t2;
    for (int i = 3; i <= n; i++) {
        printf(", %d", nextTerm);
        t1 = t2;
        t2 = nextTerm;
        nextTerm = t1 + t2;
    }
    printf("\n");
}


void factorial(int num) {
    unsigned long long fact = 1;
    for (int i = 1; i <= num; i++) {
        fact *= i;
    }
    printf("Factorial of %d = %llu\n", num, fact);
}


void three_number_maximum(int a, int b, int c) {
    if (a >= b && a >= c) {
        printf("Maximum: %d\n", a);
    } else if (b >= a && b >= c) {
        printf("Maximum: %d\n", b);
    } else {
        printf("Maximum: %d\n", c);
    }
}

int main() {
```

```
    palindrome(121);
    vowel('A');
    armstrong(153);
    reverse_number(1234);
    sum_of_digits(1234);
    count_digits(1234);
    calculator('+', 5.0, 3.0);
    fibonacci(10);
    factorial(5);
    three_number_maximum(10, 20, 30);

    return 0;
}
```