EXPERIMENT NO. 07

AIM: Write a program to print the table of a number from start to end in increasing or decreasing order using recursion.

SCOPE: Multiplication tables are fundamental in mathematics and help in quick calculations. Recursion is a technique where a function calls itself until a base condition is met. This experiment demonstrates how recursion can be used to print multiplication tables dynamically in both increasing and decreasing order.

FACILITIES: Software Needed: Turbo C / Any C Compiler

THEORY: Multiplication tables are used for arithmetic calculations. Using recursion, we can generate a multiplication table by calling the function repeatedly with an incremented or decremented value.

Working Principle:

1. If the `start` value is less than `end`, the function prints the table in increasing order.
2. If `start` is greater than `end`, the function prints the table in decreasing order.
3. The function calls itself recursively, modifying the `start` value, until it reaches `end`.

IMPLEMENTATION:

```
#include <stdio.h>

// Recursive function to print multiplication table
void printTable(int num, int start, int end) {
    // Print the multiplication result
    printf("%d x %d = %d\n", num, start, num * start);

    // Recursive calls
    if (start > end) // Decreasing order
        printTable(num, start - 1, end);
    else if (start < end) // Increasing order
        printTable(num, start + 1, end);
}

int main() {
    int num, start, end;

    // Taking user input
    printf("Enter a number: ");
    scanf("%d", &num);
    printf("Enter the start of the table: ");
    scanf("%d", &start);
    printf("Enter the end of the table: ");
    scanf("%d", &end);

    // Function call
    printTable(num, start, end);

    return 0;
}
```

OUTPUT:

Case 1: Increasing Order

```
Enter a number: 5
Enter the start of the table: 2
Enter the end of the table: 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
```

Case 2: Decreasing Order

```
Enter a number: 7
Enter the start of the table: 5
Enter the end of the table: 2
7 x 5 = 35
7 x 4 = 28
7 x 3 = 21
7 x 2 = 14
```

RESULT: Thus, we have successfully implemented a program to print the multiplication table of a given number in increasing or decreasing order using recursion.