

# 1. C Program for Factorial Calculation Using For Loop and Its Testing

## C Program

```
#include <stdio.h>

int main() {
    int n, i;
    long fact = 1;

    printf("Enter a number: ");
    scanf("%d", &n);

    if (n < 0) {
        printf("Factorial not defined for negative numbers");
    } else {
        for (i = 1; i <= n; i++) {
            fact = fact * i;
        }
        printf("Factorial of %d is %ld", n, fact);
    }
    return 0;
}
```

## Test Cases – Factorial Program

Test Case ID	Input (n)	Expected Output	Actual Output	Result
TC_F1	5	120	120	Pass
TC_F2	0	1	1	Pass
TC_F3	1	1	1	Pass
TC_F4	7	5040	5040	Pass

## 2. Five Test Cases for Do...While Loop (Condition Variations)

### Program Used

```
int i = 1;
do {
    printf("%d ", i);
    i++;
} while (i <= 5);
```

### Test Cases – Do...While Loop

Test Case ID	Initial Value of i	Condition	Expected Output	Actual Output	Result
TC_DW1	1	$i \leq 5$	1 2 3 4 5	1 2 3 4 5	Pass
TC_DW2	5	$i \leq 5$	5	5	Pass
TC_DW3	6	$i \leq 5$	6	6	Pass
TC_DW4	0	$i \leq 5$	0 1 2 3 4 5	0 1 2 3 4 5	Pass
TC_DW5	1	Wrong condition	Infinite loop	Infinite loop	Fail

### 3. Decision Table for Switch Case Structure

#### Switch Case Example

```
switch(day) {  
    case 1: printf("Monday"); break;  
    case 2: printf("Tuesday"); break;  
    case 3: printf("Wednesday"); break;  
    case 4: printf("Thursday"); break;  
    case 5: printf("Friday"); break;  
    case 6: printf("Saturday"); break;  
    case 7: printf("Sunday"); break;  
    default: printf("Invalid Day");  
}
```

#### Decision Table

Input Condition	Action Performed
day = 1	Print "Monday"
day = 2	Print "Tuesday"
day = 3	Print "Wednesday"
day = 4	Print "Thursday"
day = 5	Print "Friday"
day = 6	Print "Saturday"
day = 7	Print "Sunday"
Other values	Print "Invalid Day"

## 4. Execution of Control Statement Programs and Result Recording

Program	Control Statement	Execution Result
Factorial Program	For Loop	Successfully Executed
Number Printing	Do... While Loop	Successfully Executed
Day Selection	Switch Case	Successfully Executed
Even/Odd Check	If...Else	Successfully Executed

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