Lab 05 – Q1

```c
#include <stdio.h>

int calNum(int n, int r);
float calNCR(int n, int r);
int calfactorial(int n);

int main() {
    int n, r;
    char opr;

    printf("Enter the Letter for dedicated operater (F-factorial, C-NCR, P-NPR) : ");
    scanf(" %c", &opr);  // Use %c to read a character.

    switch (opr) {
        case 'F':
            printf("Enter Value for n: ");
            scanf("%d", &n);
            printf("Factorial of %d: %d\n", n, calfactorial(n));
            break;

        case 'C':
            printf("Enter Value for n and r: ");
            scanf("%d %d", &n, &r);
            printf("NCR(%d, %d): %.2f\n", n, r, calNCR(n, r));
            break;

        case 'P':
            printf("Enter Value for n and r: ");
            scanf("%d %d", &n, &r);
            printf("NPR(%d, %d): %d\n", n, r, calNum(n, r));
            break;

        default:
            printf("Invalid operator!\n");
    }

    return 0;
}

int calNum(int n, int r) {
    int sum = 1;  // Initialize to 1, not 0.
    int x = n - r;
```

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    while (n >= 1) {
        sum *= n;
        n--;
    }

    while (x >= 1) {
        sum /= x;  // Divide instead of multiply.
        x--;
    }

    return sum;
}

float calNCR(int n, int r) {
    float sum3 = 1.0;  // Initialize to 1.0 for floating-point result.
    float sumr = 1.0;
    float x = n - r;

    while (n >= 1) {
        sum3 *= n;
        n--;
    }

    while (r >= 1) {
        sumr *= r;
        r--;
    }

    while (x >= 1) {
        sumr *= x;
        x--;
    }

    return sum3 / (sumr);
}

int calfactorial(int n) {
    int sumf = 1;

    while (n >= 1) {
        sumf *= n;
        n--;
```

```
    while (n >= 1) {
        sumf *= n;
        n--;
    }

    return sumf;
}
```

```
Enter the Letter for dedicated operater (F-factorial, C-NCR, P-NPR) : F
Enter Value for n: 5
Factorial of 5: 120

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Process exited after 10.56 seconds with return value 0
Press any key to continue . . .
```

```
Enter the Letter for dedicated operater (F-factorial, C-NCR, P-NPR) : C
Enter Value for n and r: 4 2
NCR(4, 2): 6.00

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Process exited after 12.19 seconds with return value 0
Press any key to continue . . .
```

```
Enter the Letter for dedicated operater (F-factorial, C-NCR, P-NPR) : P
Enter Value for n and r: 5 3
NPR(5, 3): 60

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Process exited after 10.66 seconds with return value 0
Press any key to continue . . .
```