



MUKESH PATEL SCHOOL OF  
TECHNOLOGY MANAGEMENT  
& ENGINEERING <sup>TM</sup>

# Programming for Problem Solving (Exp 8 - 1)

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## Task 1:

1. A function prototype with a return type of integer with the name fun and one input of integer type is declared.
2. The function fun is called with the input parameter as 10 and the returned value is stored in integer i.
3. The body of the integer fun is defined and it returns the value of i++

## Task 2:

### Output:

I am in a  
I am in b  
I am in c  
I am in b  
I am in c  
I am in c

### Explanation:

The function a is called which in turn calls function b which calls function c.

The function b is called which in turn calls function c.

The function c is called.

This leads to abc then bc then c to be printed.

## Task 3:

9  
11

## Task 4:

2612

## Task 5:

Enter two numbers // We enter 5 and 2

Before adding

52

Inside the function 1512

After adding

52

**The addition does not have any effect because pass by value was used and not by reference. The variables inside the function are independent of the main function.**

## Task 6:

```
int factorial(int n)
{
    int ans = 1;
    for (int i = 2; i <= n; i++)
        ans *= i;
    return ans;
}
```

## Homework Questions:

**1:**

A function prototype is required when a function is called before its body has been defined (i.e. The function is defined below the main function) or when the function is used in a class.

**2:**

Formal parameters are the parameters declared during function definition and the Actual parameters are the values passed when the function is called.

**3:**

```
#include <iostream>
```

```
using namespace std;
```

```
void add(int, int, int, int);
```

```
void subtract(int, int, int, int);
```

```
void product(int, int, int, int);
```

```
int main() {
```

```
    int r1, i1, r2, i2, ans_r, ans_i;
```

```
    char input;
```

```
    do {
```

```
        cout << "Enter the first complex number: ";
```

```
        cin >> r1 >> i1;
```

```
        cout << "\nEnter the second complex number: ";
```

```
cin >> r2 >> i2;
int choice;
cout << "\n\nEnter your choice:\n1) Addition \n2) Subtraction\n3)
Multiplication\n";
cin >> choice;
cout << "\n\n";
switch (choice) {
case 1:
    add(r1, r2, i1, i2);
    break;
case 2:
    subtract(r1, r2, i1, i2);
    break;
case 3:
    product(r1, r2, i1, i2);
    break;
default:
    cout << "Invalid Option!!";
    break;
}
cout << "\n\nDo you wish to repeat the program? (Y/n)\n";
cin >> input;
cout << endl;
} while (input == 'y' || input == 'Y');
return 0;
}
```

```
void add(int x1, int x2, int y1, int y2) {
    cout << "Sum: " << x1 + x2 << " + " << y1 + x2 << "i";
}
```

```
void subtract(int x1, int x2, int y1, int y2) {
    cout << "Difference: " << x1 - x2 << " + " << y1 - x2 << "i";
}
```

```
void product(int x1, int x2, int y1, int y2) {
```

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```
cout << "Product: " << x1 * x2 - y1 * y2 << " + " << x1 * y2 + y1 * x2 <<  
"i";  
}
```