

Tutorial 4

1. Java Does not support default arguments by default. Explain how to use method overloading techniques to create default arguments indirectly. Refer the link : <https://stackoverflow.com/questions/997482/does-java-support-default-parameter-values>
2. Explain the term “[stepwise refinement](#)” using the following scenario.
“When printing a check, it is customary to write the check amount both as a number (“\$274.15”) and as a text string (“two hundred seventy-four dollars and 15 cents”).
Write a program to turn a number into a text string”
3. What does this display?

```
public static void main(String[] args) {  
    int aValue = 3;  
    multiply(aValue, 2);  
}  
private static void multiply(int sum1, int sum2){  
    sum1=sum1*sum2;  
    System.out.println(sum2+" "+sum1);  
}
```

- a. Rewrite it so the method returns the final value to the main program and then displays it.
 - b. Can you make it return a double ex: return (double) sum1;
4. Write a method which will take in a number and give back two times the number given. Write the main body of the program to call the function, and when a value is returned the main body should display it.
 5. Write a program that will take a number and return the result of multiplying all the numbers together from 1 to the number given. (factorial). Write the main body of the program to call the function, and when a value is returned the main body should display it.
 6. What does this display?

```
//swaps parameter names around in function call  
public static void main(String[] args) {  
    int a = 2;  
    int b = 5;  
    int c = 4;  
    mixup(a, b, 3);  
}
```

```
private static void mixup(int b, int c, int a ) {  
    a = b + c - a;  
    System.out.println(a + " " + c);  
}
```

7. What does this display

```
public class Main { // demonstrate scope and functions  
    static int aValue = 5;  
    public static void main(String[] args) {  
        int aValue = 6;  
        int bValue = 4;  
        process(bValue);  
        System.out.println(aValue);  
    }  
    private static void process(int aValue) { //AA  
        aValue = aValue + 4;  
        System.out.println(aValue);  
    }  
}
```

- a. How different is the display if line AA above was:

```
private static void process(int cValue) { //AA
```

- b. Can you turn the procedure into a function that returns an int and then displays it.
c. Can you turn the procedure into a function to return a double?

8. Does this multiply 3*2 or add 3 to 2? Why?

```
public static void main(String[] args) {  
    double Num1 = 3.0;  
    int Num2 = 2;  
    double total;  
    total = processA( Num1, Num2);  
    System.out.println(total);  
}  
private static double processA(double Sum, int Count) {  
    double newAnswer = Sum + (double) Count;  
    return newAnswer;  
} this program continues on next page >  
private static double processA(int Sum, double Count) {  
    double newAnswer = (double) Sum * Count;  
    return newAnswer;  
}
```

- a. How would you make them both return back an 'int'?

9. Write the factorial function in question 5 using recursion.

Note: Factorial of n is the product of all positive descending integers. Factorial of n is denoted by n!.

For example

$$4! = 4 \times 3 \times 2 \times 1 = 24$$

$$5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$$

10. A nonnegative integer is called a palindrome if it reads forward and backward in the same way. For example, the numbers 5, 121, 3443, and 123454321 are palindromes. Write a method that takes as input a nonnegative integer and returns true if the number is a palindrome; otherwise, it returns false. Also write a program to test your method.