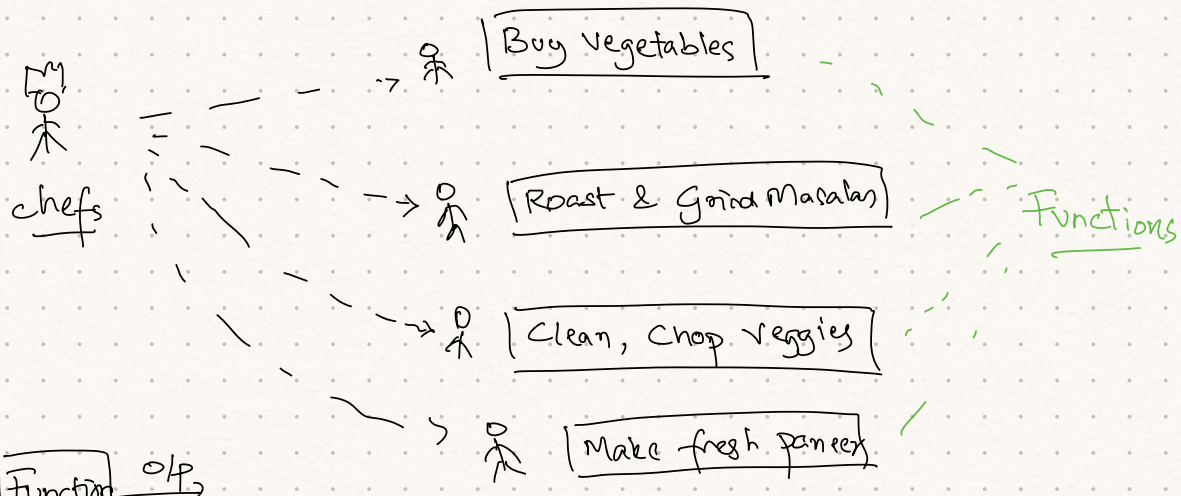
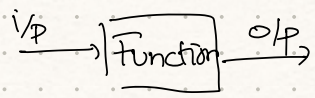
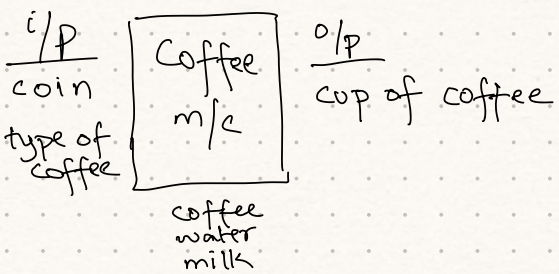
Functions

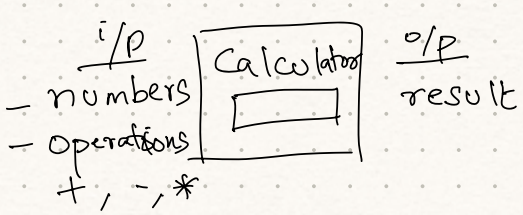
- What are functions ?
- Why useful ?
- Java Syntax.
- Problems !

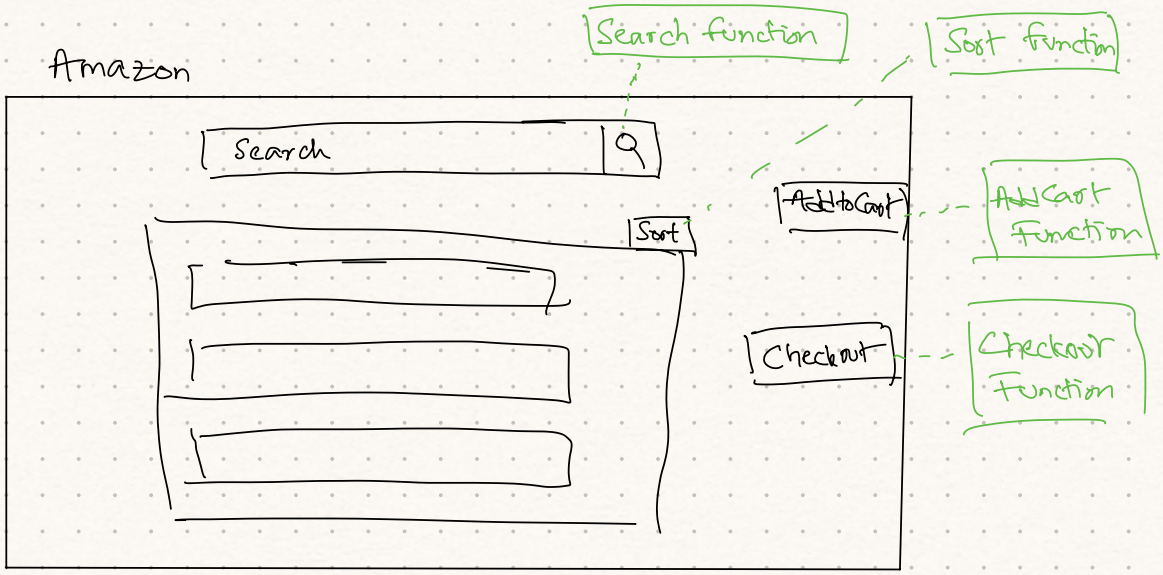




e.g.

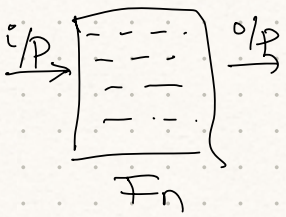






Functions help organise code into manageable blocks

Function ≡ Block of code



```java
public static void main(String[] args) {
  String name = "Masai";
  System.out.println(name, name.length());

  int a = 3;
  int b = 5;
  int sum = a + b;
  System.out.println("Sum is "+sum);

  int x = 4;
  int y = 8;
  int multiply = x*y;
  System.out.println("Product is "+x*y);
}
```

Output:

Masai 5

Sum is 8

Product is 32

Main.java

Camel Case

Function name

```java
class Main {
  public static void printName() {
    String name = "Masai";
    System.out.println(name, name.length());
  }

  public static void sum() {
    int a = 3;
    int b = 5;
    int sum = a + b;
    System.out.println("Sum is "+sum);
  }

  public static void product(){
    int x = 4;
    int y = 8;
    int result = x*y;
    System.out.println("Product is "+result);
  }
}
```

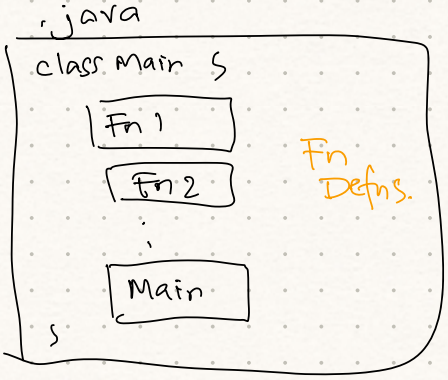
Body of Fn

Function Definitions

```java
public static void main(...){
  product();
  printName(); // Function Call
  sum();
}
```

Need to CALL a function to execute it.

.java

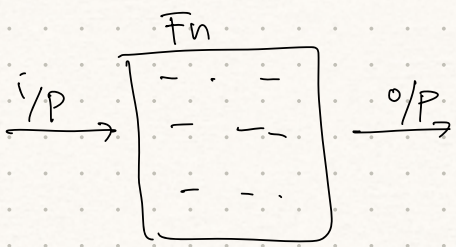


Output:

Product is 32

Masai 5

Sum is 8



Fn printname takes as input a String name.

```
public static void printName(String name) {
  System.out.println(name, name.length());
}

public static void sum(int a, int b) {
  int sum = a + b;
  System.out.println("Sum is "+sum);
}

public static void product(int x, int y){
  int result = x*y;
  System.out.println("Product is "+result);
}

public static void main(String[] args) {
  int a = 6; int b = 2;
  sum(a,b);
  product(a,b);
  String name = "Masai";
  printName(name);
}
```

Parameters (i/p to function)

In Fn Calls we provide actual values to the parameters

```
public static void printName() {
  String name = "Masai";
  System.out.println(name, name.length());
}

public static void sum() {
  int a = 3;
  int b = 5;
  int sum = a + b;
  System.out.println("Sum is "+sum);
}

public static void product(){
  int x = 4;
  int y = 8;
  int result = x*y;
  System.out.println("Product is "+result);
}
```

```
int a = 6; int b = 2;
sum(a, b);   // 8
a++; b++;
sum(a, b);   // 10

int c = 23; int d = 46;
sum(c, d);
```

no return value

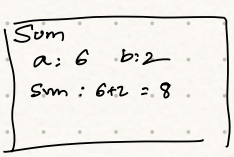
return type (type of output)

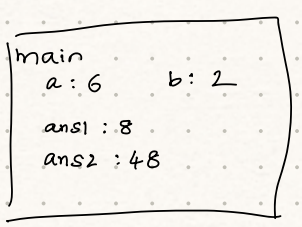
```
public static void printName(String name) {
  System.out.println(name, name.length());
}

public static int sum(int a, int b) {
  int sum = a + b;
  return sum;
}

public static int product(int x, int y){
  int result = x*y;
  return result;
}

public static void main(String[] args) {
  int a = 6; int b = 2;
  int ans1 = sum(a,b);
  int ans2 = product(a,ans1);
  System.out.println(ans2);
  String name = "Masai";
  printName(name);
}
```





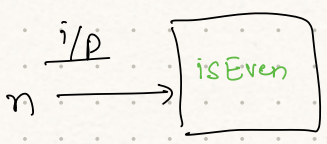
Exercise : Write functions for following:

1. To check if a number n is even or not.
   (return true if even, false otherwise)

2. To find the square of a number n.

3. To find sum of numbers from 1 to n.

1

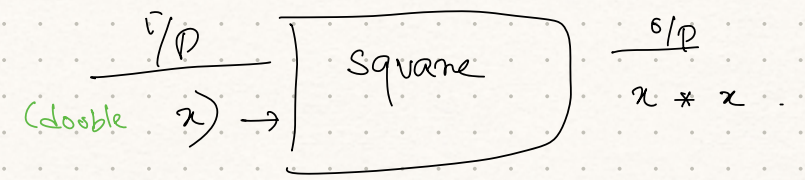



```
public static boolean isEven(int n) {
    if (n % 2 == 0) {
        return true;
    }else {
        return false;
    }
}
```

```
if (n%2 == 0) {
    return true
}
return false;
```

```
main() {
    S.O.P (isEven(12)); // true
    S.O.P (isEven(23)); // false
}
```

2.




```
public static double square (double x ) {
    return x * x ;
}
```