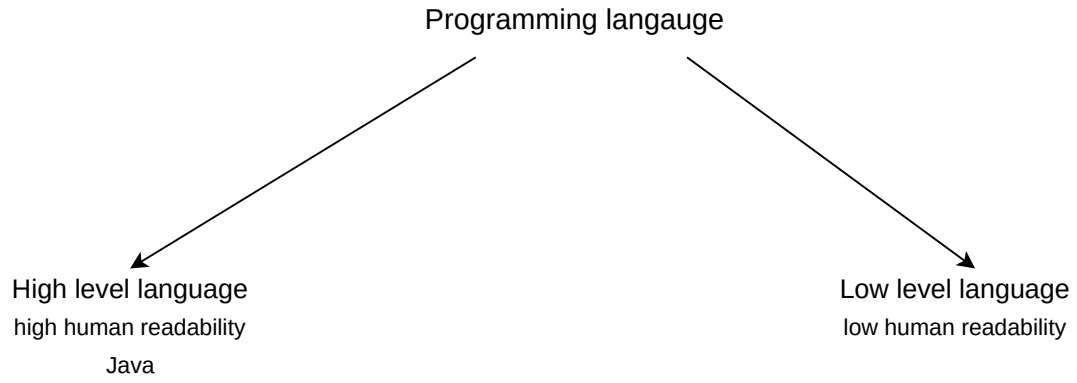
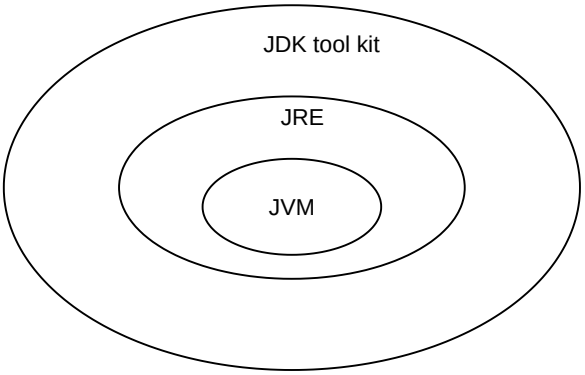
What is a programming language ?

set of instructions for obtaining outout.

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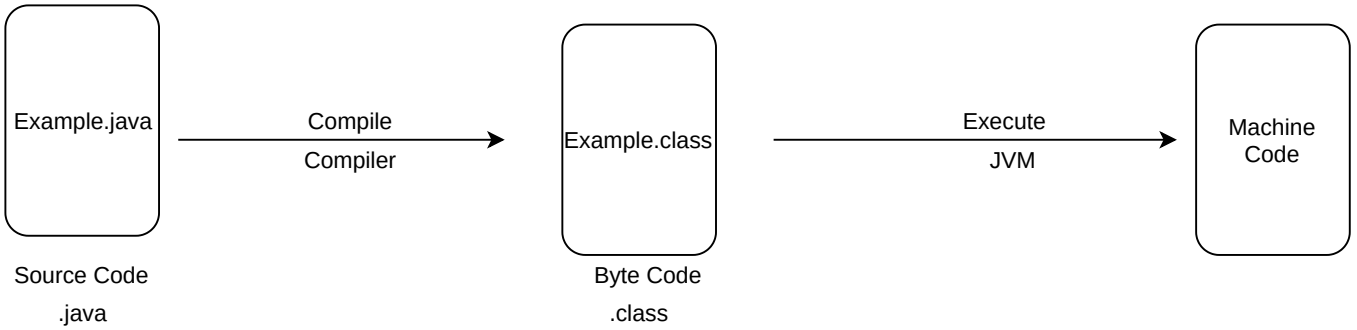
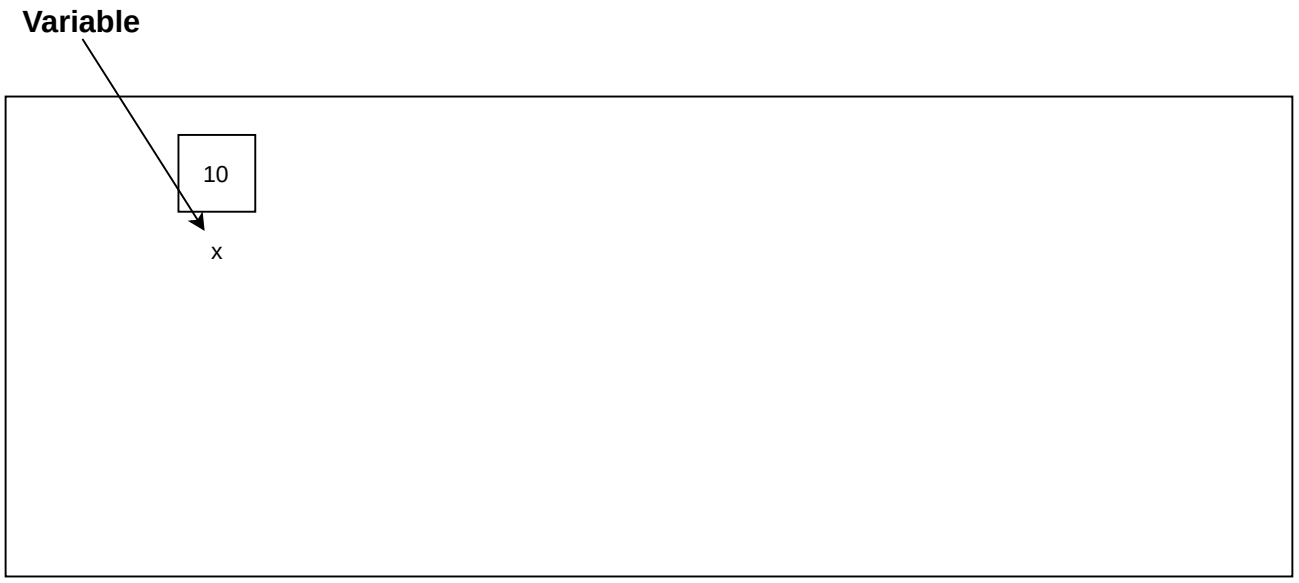
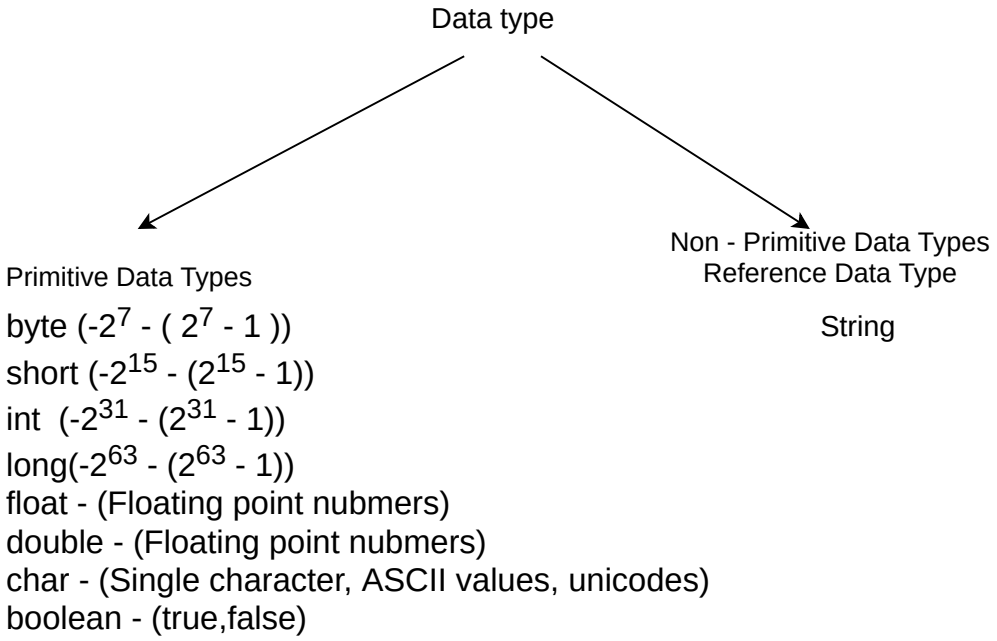


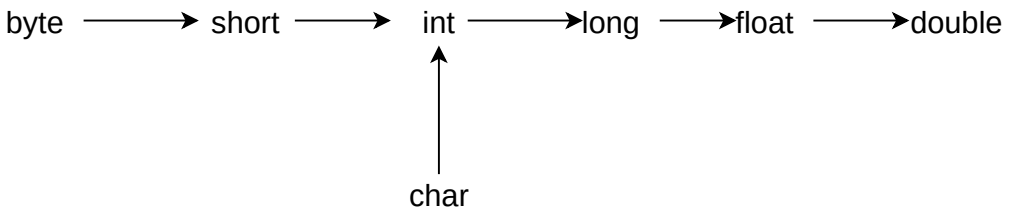



## Data type




byte ($-2^7$ - ( $2^7$ - 1 ))
short ($-2^{15}$ - ($2^{15}$ - 1))
int ($-2^{31}$ - ($2^{31}$ - 1))
long($-2^{63}$ - ($2^{63}$ - 1))
float - (Floating point nubmers)
double - (Floating point nubmers)
char - (Single character, ASCII values, unicodes)
boolean - (true,false)

```
class Example{
	public static void main(String args[]){

		// numbers only
		byte b = 10; // byete variiable
		short s = 10;
		int i = 10;
		long l = 10;

		// floating point numbers
		float f = 10.5F;
		double d = 10.5;

		// Single character
		char c = '\u0051';
		char c1= 'A';
		char c2= 65;

		// (true or false)
		boolean bool = true;
		boolean bool1 = false;

		// text
		String text = "Hello Java";

	}
}
```

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Operators

+ Addition
- Subtraction
* Multiplication
/ Devision
% Modulu
++ Increment
-- Decrement

x++ = postfix
++x = prefix

```
class Example{
	public static void main(String args[]){
		int x = 10;
		int y = 20;

		/*System.out.println(answer);
		System.out.println(answer);
		System.out.println(answer);*/ // --> Block Comment

		// Addition --> Line Comment
		int answer = x + y;
		System.out.println(answer);

		// Subtraction
		answer = y - x;
		System.out.println(answer);

		// Multiplication
		answer = x * y;
		System.out.println(answer);

		// Devision
		answer = y / x;
		System.out.println(answer);

		// Modulu
		int a = 10;
		int b = 3;

		answer = a%b;
		System.out.println(answer);

		// Increment
		answer = ++x;
		System.out.println(answer);

		// Decrement
		answer = --y;
		System.out.println(answer);

		x = 10;

		System.out.println(x); // 10
		System.out.println(x++); // 10 --> postfix
		System.out.println(x); // 11
		System.out.println(++x); // 12 --> prefix


	}
}
```

---

# Scanner

Input Int

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

		System.out.print("Enter Your Number : ");
		int x = input.nextInt();

		System.out.println("Your Number is : " + x);
	}
}
```

Input String

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

		System.out.print("Enter Your Name : ");
		String name = input.next();

		System.out.println("Your Name is : " + name);
	}
}
```

## Exercises :

**Total of Two numbers**

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

		System.out.print("Enter First Number : ");
		int firstNumber = input.nextInt();


		System.out.print("Enter Second Number : ");
		int secondNumber = input.nextInt();

		int total = firstNumber + secondNumber;
		System.out.println("Total is : "+total);
	}
}
```

**Total of Five numbers and Average**

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

		System.out.print("Enter First Number : ");
		int firstNumber = input.nextInt();


		System.out.print("Enter Second Number : ");
		int secondNumber = input.nextInt();

		System.out.print("Enter Third Number : ");
		int thirdNumber = input.nextInt();

		System.out.print("Enter Fourth Number : ");
		int fourthNumber = input.nextInt();

		System.out.print("Enter Fifth Number : ");
		int fifthNumber = input.nextInt();

		int total = firstNumber + secondNumber + thirdNumber +
fourthNumber + fifthNumber;
		System.out.println("Total is : " + total);

		double average = (double)total / 5;

		System.out.println("Average is : " + average);
	}
}
```

**Salary Meater (Scanner, Operaters)**

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

		System.out.print("Enter Salary : ");
		int salary = input.nextInt();

		int notes = salary / 5000;
		salary  = salary % 5000;
		System.out.println("5000 notes : " + notes);

		notes = salary / 2000;
		salary = salary % 2000;
		System.out.println("2000 notes : " + notes);

		notes = salary / 1000;
		salary = salary % 1000;
		System.out.println("1000 notes : " + notes);

		notes = salary / 500;
		salary = salary % 500;
		System.out.println("500 notes : " + notes);

		notes = salary / 100;
		salary = salary % 100;
		System.out.println("100 notes : " + notes);

		notes = salary / 50;
		salary = salary % 50;
		System.out.println("50 notes : " + notes);

		notes = salary / 20;
		salary = salary % 20;
		System.out.println("20 notes : " + notes);

		notes = salary / 10;
		salary = salary % 10;
		System.out.println("10 coins : " + notes);

		notes = salary / 5;
		salary = salary % 5;
		System.out.println("5 coins : " + notes);

		notes = salary / 2;
		salary = salary % 2;
		System.out.println("2 coins : " + notes);

		notes = salary / 1;
		salary = salary % 1;
		System.out.println("1 coins : " + notes);

	}
}
```

# Day 1.

## If Condition

Sometimes we have to make decision. In thos cases if condition can be used.

### If

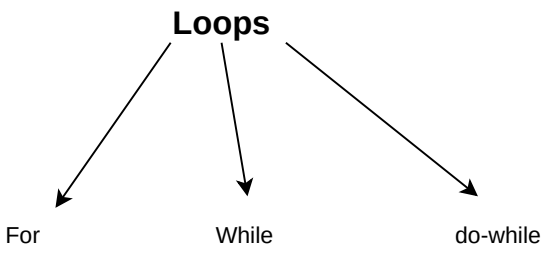
```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

	System.out.print("Enter your age : ");
	int age = input.nextInt();

		if(age >= 18){
	    System.out.println("Elder...");
	}


	}
}
```

### If-else

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

	System.out.print("Enter your age : ");
	int age = input.nextInt();

		if(age >= 18){
	    System.out.println("Elder...");
	}else{
	    System.out.println("Child...");
	}


	}
}
```

### If-elseIf

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

	System.out.print("Enter your age : ");
	int age = input.nextInt();

		if(age < 18){
	    System.out.println("Child...");
	}else if(age < 35){
	    System.out.println("Young...");
	}else{
	    System.out.println("Elder...");
	}


	}
}
```




## For Loop

```
import java.util.*;

class Example{
      public static void main(String args[]){

      for(int i = 0 ;i < 10 ; i++){
          System.out.println("Java");
      }

      }
}
```

Exercise

```
* * * *
* * * *
* * * *
* * * *
```

```
import java.util.*;

class Example{
      public static void main(String args[]){

      for(int i = 0 ; i < 4 ; i++){
          System.out.println("* * * *");
      }

      }
}
```

```
*
* *
* * *
* * * *
```

```
import java.util.*;

class Example{
      public static void main(String args[]){
      for(int i = 1 ; i <= 4 ; i++){

          for(int j = 0 ; j < i ; j++){
              System.out.print("* ");
          }
          System.out.println();

      }
      }
}
```

**Find max value of 5 numbers**

```
import java.util.*;

class Example{
      public static void main(String args[]){
      Scanner input = new Scanner(System.in);

      int number = 0;
      int max = 0;

      for(int i = 1 ; i <= 10 ; i++){
          System.out.print("Enter number "+ i + " :
");
          number = input.nextInt();

          if(max < number){
              max = number;
          }
      }

       System.out.println("Miximum value is : " +
max);
      }
}
```

**Find max value,total,average of 5 numbers**

```
import java.util.*;

class Example{
      public static void main(String args[]){
      Scanner input = new Scanner(System.in);

      int number = 0;
      int max = 0;
      int total = 0;

      for(int i = 1 ; i <= 10 ; i++){
          System.out.print("Enter number "+ i + " : ");
          number = input.nextInt();

          if(max < number){
              max = number;
          }

          total = total + number;
      }
       double average = total/(double)10;

       System.out.println("Miximum value is : " +
max);
       System.out.println("Total is : "+total);
       System.out.println("Average is : "+average);
       }
}
```

Exercise : -

**Find max value of two nubmers**

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

	System.out.print("Enter first number : ");
	int firstNumber = input.nextInt();


	System.out.print("Enter second number : ");
	int secondNumber = input.nextInt();

	if(firstNumber > secondNumber){
	   System.out.println("Max Number is First Number");
	}else{
	   System.out.println("Max Number is Second Number");
	}
	}
}
```

**Find max value of three nubmers**

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

	System.out.print("Enter first number : ");
	int firstNumber = input.nextInt();


	System.out.print("Enter second number : ");
	int secondNumber = input.nextInt();

	System.out.print("Enter third number : ");
	int thirdNumber = input.nextInt();

	int max = firstNumber;

	if(max < secondNumber){
	   max = secondNumber;
	   if(max < thirdNumber){
	      max = thirdNumber;
	   }
	}else if(max < thirdNumber){
	   max = thirdNumber;
	}
	System.out.println("Max value is : " + max);
	}
}
```

**Find Result of Student**

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

	System.out.print("Enter Subject 1 Marks : ");
	int subject1 = input.nextInt();


	System.out.print("Enter Subject 2 Marks : ");
	int subject2 = input.nextInt();

	System.out.print("Enter Subject 3 Marks : ");
	int subject3 = input.nextInt();

	System.out.print("Enter Subject 4 Marks : ");
	int subject4 = input.nextInt();

	System.out.print("Enter Subject 5 Marks : ");
	int subject5 = input.nextInt();

	int total = subject1 + subject2 + subject3 + subject4 + subject5;

	double average = total / (double)5;

	if(average >= 50){
	   System.out.println("Pass...");
	}else{
	   System.out.println("Fail...");
	}

	}
}
```

**Find Student Grade**

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

	System.out.print("Enter Student Marks : ");
	int marks = input.nextInt();

	if(marks >= 75){
	   System.out.println("A");
	}else if(marks >= 65){
	   System.out.println("B");
	}else if(marks >= 55){
	   System.out.println("C");
	}else if(marks >= 35){
	   System.out.println("S");
	}else {
	   System.out.println("F");
	}

	}
}
```

## While Loop

```
import java.util.*;

class Example{
        public static void main(String args[]){

        int i = 1;

        while(i <= 10){
            System.out.println(i);
            i++;
        }

        }
}
```

Excercise

**Find odd numbers between 1-100**

```
import java.util.*;

class Example{
        public static void main(String args[]){

        int i = 1;
        int number = 0;

        while(i <= 100){

            number = i % 2;

            if(number == 0){
                System.out.println(i);
            }
            i++;
        }

        }
}
```

## do-while loop

```
import java.util.*;

class Example{
        public static void main(String args[]){

        int i = 10;
        do{
            System.out.println("working...");
            i++;
        }while(i < 10);

        }
}
```

# Day - 2.

## Switch case

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

		System.out.print("Enter a Letter : ");
		String letter = input.next();

		switch(letter){
			case "A" :
				System.out.println("Apple");
				break;
			case "B" :
				System.out.println("Ball");
				break;
			case "C" :
				System.out.println("Cat");
				break;
			case "D" :
				System.out.println("Doll");
				break;
			default :
				System.out.println("Invalid Entry");
		}
	}
}
```

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

		boolean flag = true;

		while(flag){
			System.out.print("Enter Student Name : ");
			String name = input.next();

			System.out.print("Enter Student Address : ");
			String address = input.next();

			System.out.print("Enter Number Of Subjects : ");
			int number_of_subjects = input.nextInt();

			int marks = 0;
			int max = 0;
			int total = 0;

			for(int i = 1 ; i <= number_of_subjects ; i++){
				System.out.print("Enter Subject "+i+" Marks : ");
				marks = input.nextInt();

				if(max < marks){
					max = marks;
				}

				total = total + marks;
			}

			System.out.println("A. Show Student Details.");
			System.out.println("B. Show Maximum Marks.");
			System.out.println("C. Show Total Marks.");
			System.out.println("D. Show Average of Marks.");
			System.out.println("X. Exit.");

			System.out.print("--> ");
			String letter = input.next();

			switch(letter){
				case "A" :
					System.out.println("Student Name : "+name);
					System.out.println("Student Address :
"+address);
					break;
				case "B" :
					System.out.println("Maximum Mark is : "+max);
					break;
				case "C" :
					System.out.println("Total Marks is : "+total);
					break;
				case "D" :
					double average = total /
(double)number_of_subjects;
					System.out.println("Average is : "+average);
					break;
				case "X" :
					flag = false;
					break;
				default :
					System.out.println("Please Enter Correct
Letter....");

			}

			System.out.println();
		}


	}
}
```

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

		boolean flag = true;

		while(flag){

		System.out.println("Do you want to Enter Student Details.? (Y/N)");
		String ifExit = input.next();

		switch(ifExit){
		   case "Y":
		      System.out.print("Enter Student Name : ");
				String name = input.next();

				System.out.print("Enter Student Address : ");
				String address = input.next();

				System.out.print("Enter Number Of Subjects : ");
				int number_of_subjects = input.nextInt();

				int marks = 0;
				int max = 0;
				int total = 0;

				for(int i = 1 ; i <= number_of_subjects ; i++){
					System.out.print("Enter Subject "+i+" Marks : ");
					marks = input.nextInt();

					if(max < marks){
						max = marks;
					}

					total = total + marks;
				}

				boolean flag2 = true;

				while(flag2){

					System.out.println("A. Show Student Details.");
					System.out.println("B. Show Maximum Marks.");
					System.out.println("C. Show Total Marks.");
					System.out.println("D. Show Average of Marks.");
					System.out.println("X. Exit.");

					System.out.print("--> ");
					String letter = input.next();

					switch(letter){
						case "A" :
							System.out.println("Student Name : "+name);
							System.out.println("Student Address : "+address);
							break;
						case "B" :
							System.out.println("Maximum Mark is : "+max);
							break;
						case "C" :
							System.out.println("Total Marks is : "+total);
							break;
						case "D" :
							double average = total / (double)number_of_subjects;
							System.out.println("Average is : "+average);
							break;
						case "X" :
							flag2 = false;
							break;
						default :
							System.out.println("Please Enter Correct Letter....");

					}

				}
				System.out.println();
		      break;
		   case "N":
		      flag = false;
		      break;
		   default :
		      System.out.println("Invalid Entry....");
		}

		   }


	}
}
```

**Break**

```
for(int i = 1 ; i <= 10 ; i++){

        if(i == 5){
            break;
        }
        System.out.println(i);
    }
```

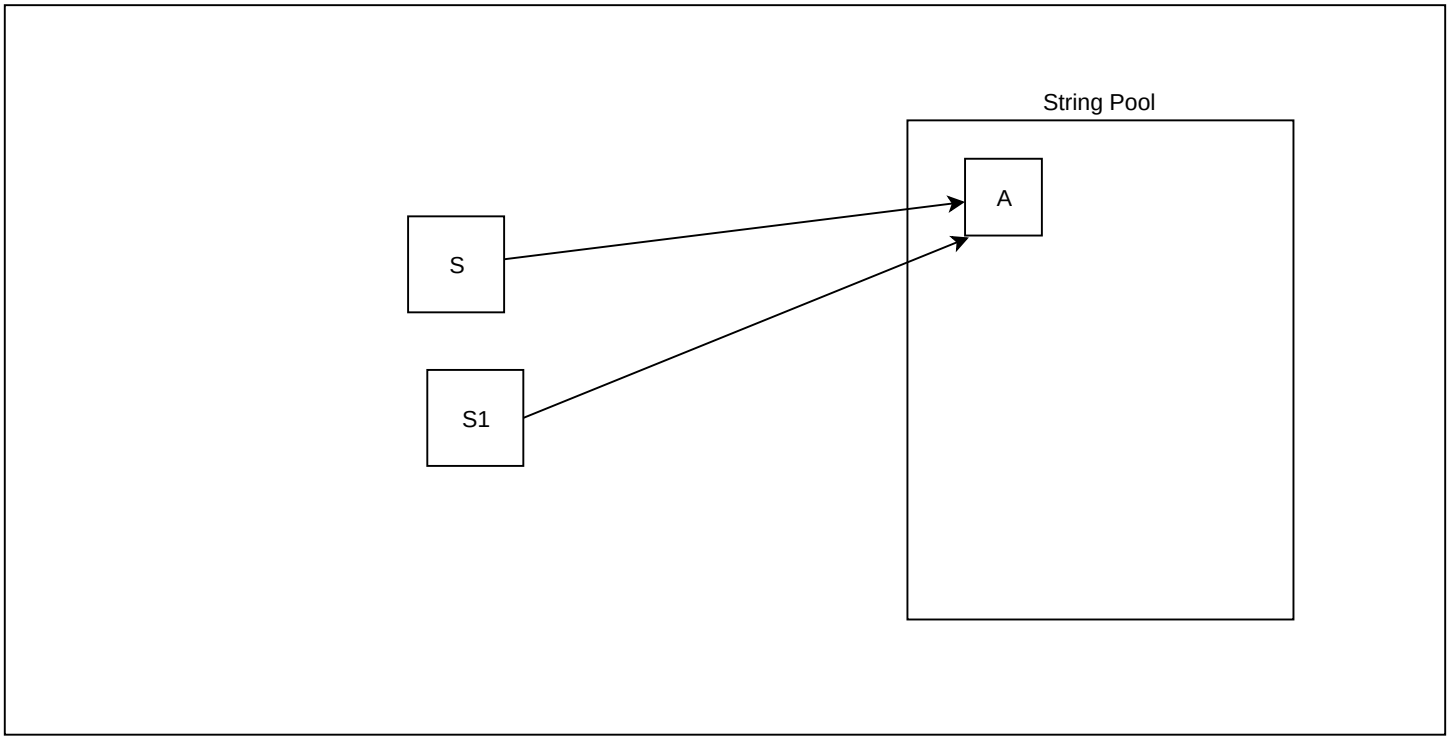
**Continue**

```
import java.util.*;

class Example{
    public static void main(String args[]){

    for(int i = 1 ; i <= 10 ; i++){
        if(i == 5){
            continue;
        }
        System.out.println(i);
    }

    }
}
```

**Return**

```
import java.util.*;

class Example{
    public static void main(String args[]){
    for(int i = 1 ; i <= 10 ; i++){
        if(i == 5){
            return;
        }
        System.out.println(i);
    }

    System.out.println("Java");
    }
}
```

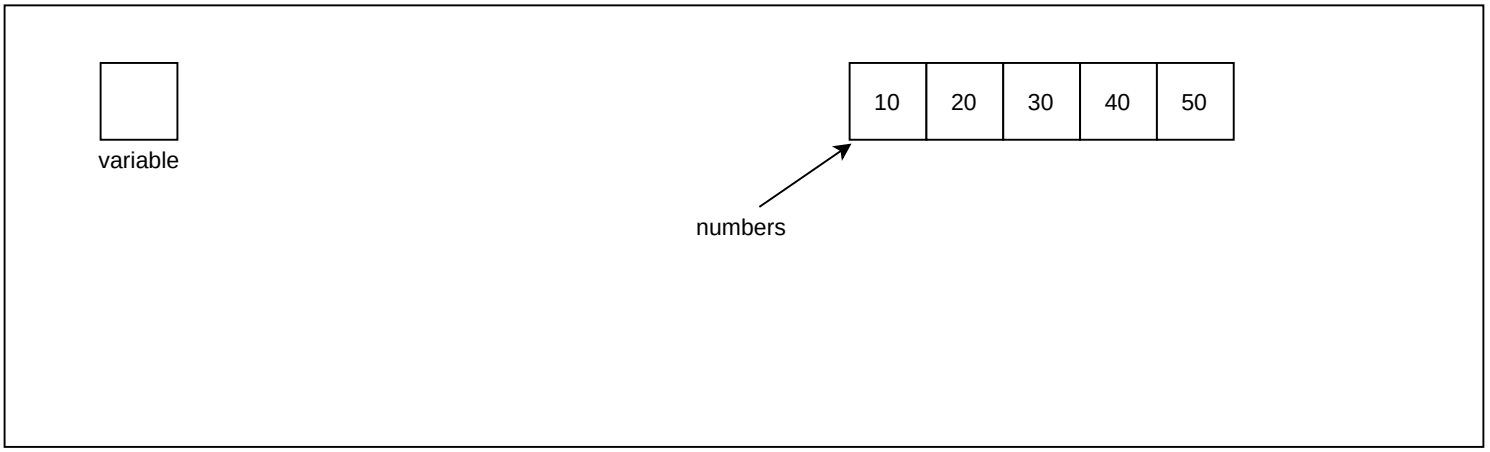
---

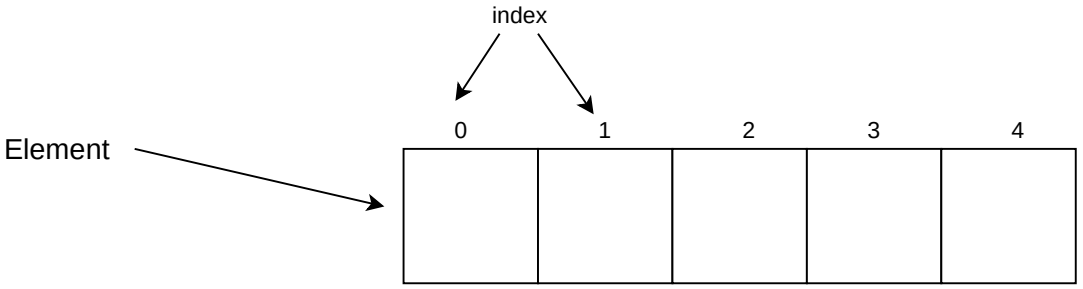


# Day-3

**Arrays**

int[ ] numbers = new int[5];




numbers

```
import java.util.*;

class Example{
	public static void main(String args[]){
		int[] numbers = new int[5];

		// initialize values to array
		numbers[0] = 10;
		numbers[1] = 20;
		numbers[2] = 30;
		numbers[3] = 40;
		numbers[4] = 50;

		// retrive values from array
		System.out.println(numbers[0]);
	}
}
```

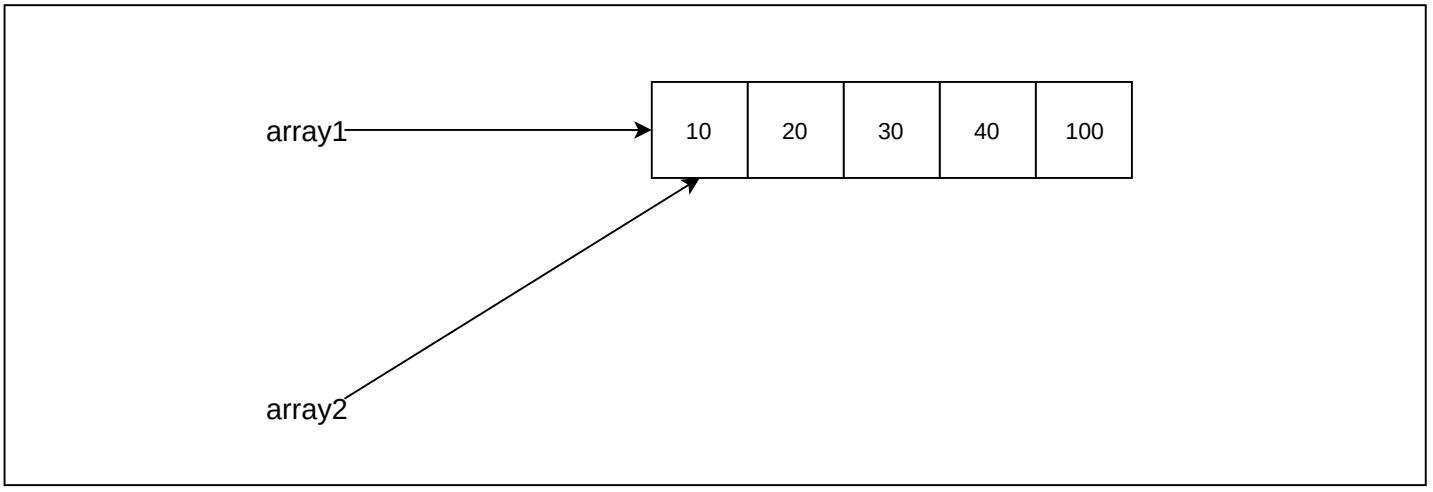
**Retrive Data Using Loop**

```
import java.util.*;

class Example{
	public static void main(String args[]){

		int[] numbers = new int[5];


		numbers[0] = 10;
		numbers[1] = 20;
		numbers[2] = 30;
		numbers[3] = 40;
		numbers[4] = 50;


		for(int i = 0 ; i < numbers.length ; i++){
			System.out.println(numbers[i]);
		}

	}
}
```

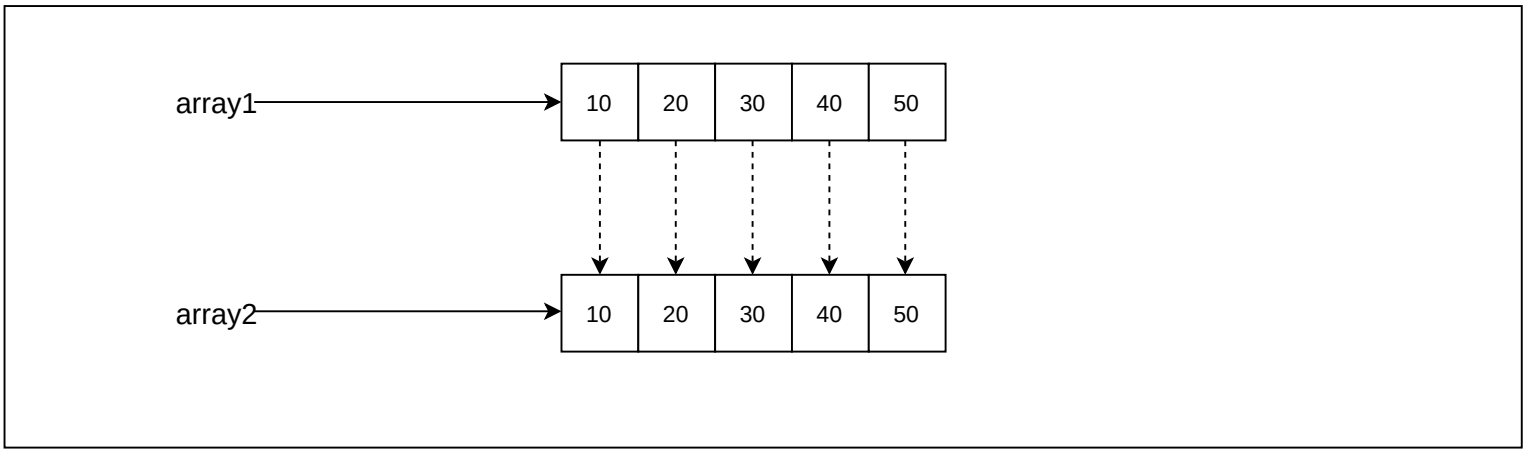
**Exercise : -**

```
import java.util.*;

class Example{
	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

		System.out.print("Enter Student Name : ");
		String name = input.next();

		System.out.print("Enter Student Address : ");
		String address = input.next();

		System.out.print("Enter Number of Subjects : ");
		int number_of_subjects = input.nextInt();

		int[] marks = new int[number_of_subjects];

		for(int i = 1 ; i <= number_of_subjects ; i++){
			System.out.print("Enter Subject "+i+" Marks :
");
			marks[i-1] = input.nextInt();
		}

		System.out.println();
		System.out.println("A. Show Student Details.");
		System.out.println("B. Show Student Marks.");
		System.out.println("C. Show Student Result.");
		System.out.println();
		System.out.print("--> ");
		String letter = input.next();

		switch(letter){
			case "A" :
				System.out.println("Student Name is :
"+name);
				System.out.println("Student Address is :
"+address);
				break;
			case "B" :
				for(int i = 0 ; i < marks.length ; i++){
					System.out.print(marks[i] + " ");
				}
				break;
			case "C" :
				int total = 0;

				for(int i = 0 ; i < marks.length ; i++){
					total = total + marks[i];
				}

				double average = total /
(double)number_of_subjects;

				if(average >= 50){
					System.out.println("Pass...");
				}else{
					System.out.println("Fail...");
				}
				break;
			default :
				System.out.println("Please Enter Valid
Letter....");
		}

	}
}
```

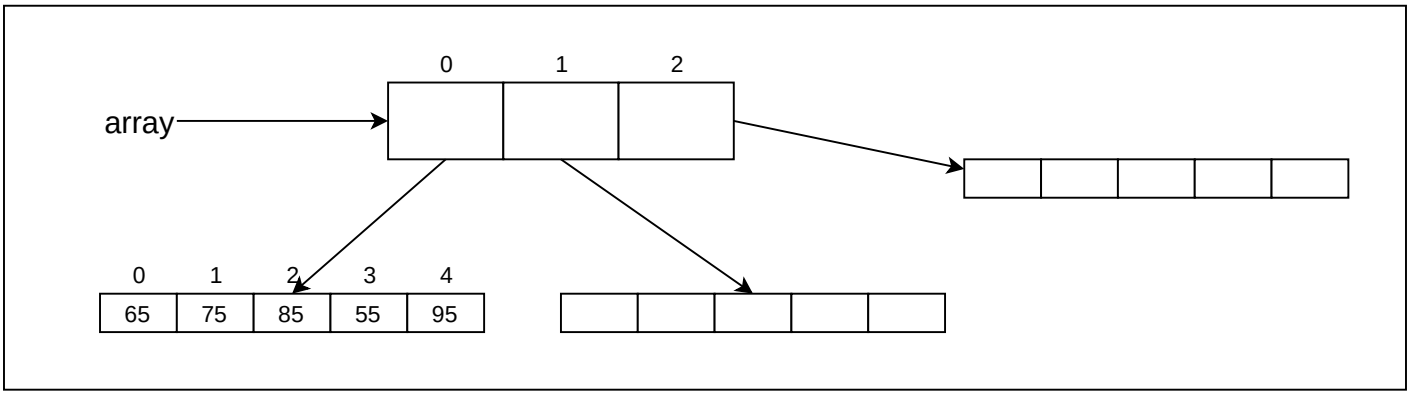
```
import java.util.*;

class Example{
	public static void main(String args[]){
		int[] array1 = {10,20,30,40,50};

		for(int i = 0 ; i < array1.length ; i++){
			System.out.print(array1[i] + " , ");
		}

		System.out.println();
		System.out.println("====================");

		int[] array2 = array1;

		array1[4] = 100;

		for(int i = 0 ; i < array1.length ; i++){
			System.out.print(array1[i] + " , ");
		}

		System.out.println();
		System.out.println("====================");

		for(int i = 0 ; i < array2.length ; i++){
			System.out.print(array2[i] + " , ");
		}

		System.out.println();

		System.out.println(array1);
		System.out.println(array2);

	}
}
```



```
import java.util.*;

class Example{
	public static void main(String args[]){
		int[] array1 = {10,20,30,40,50};

		int[] array2 = new int[array1.length];

		for(int i = 0 ; i < array1.length ; i++){
			array2[i] = array1[i];
		}

		for(int i = 0 ; i < array1.length ; i++){
			System.out.print(array1[i] + " , ");
		}
		System.out.println();

		for(int i = 0 ; i < array2.length ; i++){
			System.out.print(array2[i] + " , ");
		}

		System.out.println();
	}
}
```



# 2D Arrays




```
import java.util.*;

class Example{
	public static void main(String args[]){
		int[][] array = new int[3][5];

		array[0][0] = 65;
		array[0][1] = 75;
		array[0][2] = 85;
		array[0][3] = 55;
		array[0][4] = 95;


		System.out.println(array[0][0]);
	}
}
```

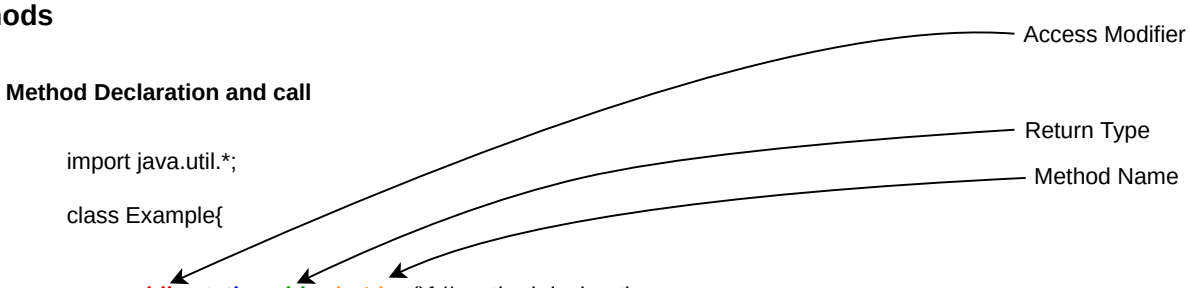
**Retrive Data using loop**

```
import java.util.*;

class Example{
	public static void main(String args[]){
		int[][] array = {{10,20,30},{40,50,60},{70,80,90}};


		// array[0] --> like Array
		// array[0][0] --> like variable

		for(int i = 0 ; i < array.length ; i++){
			for(int j = 0 ; j < array[i].length; j++){
				System.out.print(array[i][j]+ " ");
			}
			System.out.println();
		}

	}
}
```

# Day-4

## Methods

### Method Declaration and call




```
import java.util.*;

class Example{

    public static void printLine(){ // method declaration
        System.out.println("======================");
    }


    public static void main(String args[]){
        System.out.println("1");
        System.out.println("2");

        printLine(); // --> method calling

        System.out.println("3");
        System.out.println("4");

        printLine();

        System.out.println("5");
        System.out.println("6");

        printLine();

    }
}
```

**Exercise:-**

```
import java.util.*;

class Example{

    public static void main(String args[]){
        System.out.println("Start....");
        myMethod();
        System.out.println("End....");
    }

    public static void myMethod(){
        Scanner input = new Scanner(System.in);

        System.out.print("Enter First Number : ");
        int number1 = input.nextInt();

        System.out.print("Enter Second Number : ");
        int number2 = input.nextInt();

        int total = number1 + number2;

        System.out.println("Total is : " + total);
    }


}
```

```
import java.util.*;

class Example{

	public static void main(String args[]){
		System.out.println("Main");
		myMethod();
		System.out.println("End Main");
	}

	public static void myMethod(){
		System.out.println("myMethod()");
		printName();
		System.out.println("End myMethod()");
	}

	public static void printName(){
		System.out.println("printName()");
	}


}
```

## Parameterized Methods

```
import java.util.*;

class Example{

	public static void main(String args[]){

		myMethod(10,20); // arguments

		int x = 23;
		int y = 45;

		myMethod(x,y); // method arguments

	}

	public static void myMethod(int number1,int number2){ // parameters

		System.out.println(number1);

		int total = number1 + number2;

		System.out.println(total);
	}

}
```

---

```
import java.util.*;

class Example{

	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

		System.out.print("Enter First Number : ");
		int number1 = input.nextInt();

		System.out.print("Enter Second Number : ");
		int number2 = input.nextInt();

		calculateTotal(number1,number2);

		calculateMulti(number1,number2);


	}

	public static void calculateTotal(int number1, int number2){
		int total = number1 + number2;

		System.out.println("Total is : "+total);
	}

	public static void calculateMulti(int number1,int number2){
		int multi = number1 * number2;

		System.out.println("Multi is : "+multi);
	}
}
```

**Exercise**

```
import java.util.*;

class Example{

	public static void main(String args[]){
		Scanner input = new Scanner(System.in);

		System.out.print("Enter Fisrt Number : ");
		int number1 = input.nextInt();

		System.out.print("Enter Second Number : ");
		int number2 = input.nextInt();

		System.out.println();
		System.out.println("A. Addition");
		System.out.println("B. Subtraction");
		System.out.println("C. Devision");
		System.out.println("D. Multiply");
		System.out.println();
		System.out.print("--> ");
		String letter = input.next();

		switch(letter){
			case "A" :
				addition(number1,number2);
				break;
			case "B" :
				subtraction(number1,number2);
				break;
			case "C" :
				devision(number1,number2);
				break;
			case "D" :
				multi(number1,number2);
				break;
			default :
				System.out.println("Invalid Letter");
		}

	}

	public static void addition(int number1,int number2){
		int total = number1 + number2;
		System.out.println("Total is : "+total);
	}

	public static void subtraction(int number1,int number2){
		int sub = number1 - number2;
		System.out.println("Subtraction is : "+sub);
	}

	public static void devision(int number1, int number2){
		double div = number1/(double)number2;
		System.out.println("Devision is : "+div);
	}

	public static void multi(int number1,int number2){
		int multi = number1 * number2;
		System.out.println("Multi is : "+multi);
	}
}
```

## Method calling Types

```
import java.util.*;

class Example{

	public static void main(String args[]){

		Scanner input = new Scanner(System.in);

		myMethod1(10);

		myMethod2(10.45);

		myMethod3("Java");

		int[] numbers = {10,20,30,40};

		myMethod4(numbers);

		myMethod5(input);
	}

	public static void myMethod1(int x){
		System.out.println(x);
	}

	public static void myMethod2(double d){
	}

	public static void myMethod3(String s){
	}

	public static void myMethod4(int[] numbers){
	}

	public static void myMethod5(Scanner input){
	}

}
```

## Return type Methods

```
	import java.util.*;

	class Example{

		public static void main(String args[]){

			int total ;

			total = myMethod();

			System.out.println("Total is : " + total);
		}

		public static int myMethod(){
			int x = 10;
			int y = 20;

			return x + y;
		}
	}
```

**Method Overloading**

*** Same Name Differnt Parameters**

```
import java.util.*;

class Example{

	public static void main(String args[]){
		myMethod(10);
		myMethod(10,20);
		myMethod(10,20,30);
		myMethod(10,"Java");
	}

	public static void myMethod(int x){
		System.out.println("myMethod()");
	}

	public static void myMethod(int x,int y){
		System.out.println("myMethod(int,int)");
	}


	public static void myMethod(int x,int y,int z){
		System.out.println("myMethod(int,int,int)");
	}

	public static void myMethod(int x,String s){
		System.out.println("myMethod(int,String)");
	}

}
```

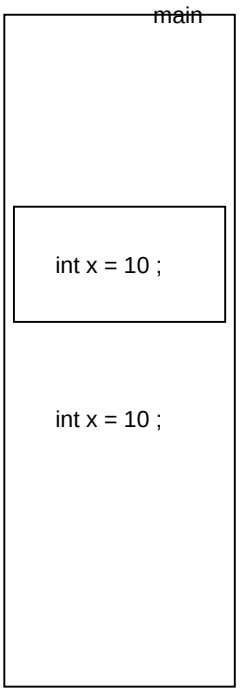
**Searching Algorithms : -** https://www.geeksforgeeks.org/searching-algorithms-in-java/

**Sorting Algorithms : -**

| | |
|---|---|
| Bubble Sort | https://stackabuse.com/sorting-algorithms-in-java/#bubblesort |
| Insertion Sort | https://stackabuse.com/sorting-algorithms-in-java/#insertionsort |
| Selection Sort | https://stackabuse.com/sorting-algorithms-in-java/#selectionsort |

# Day-5

### Variable Scope and lifetime




```
import java.util.*;

class Example{

	public static void main(String args[]){

		{
			int x = 100;
			System.out.println(x); // 100
		}

		int x = 200;

		System.out.println(x); // 200
	}
}
```

## Classes

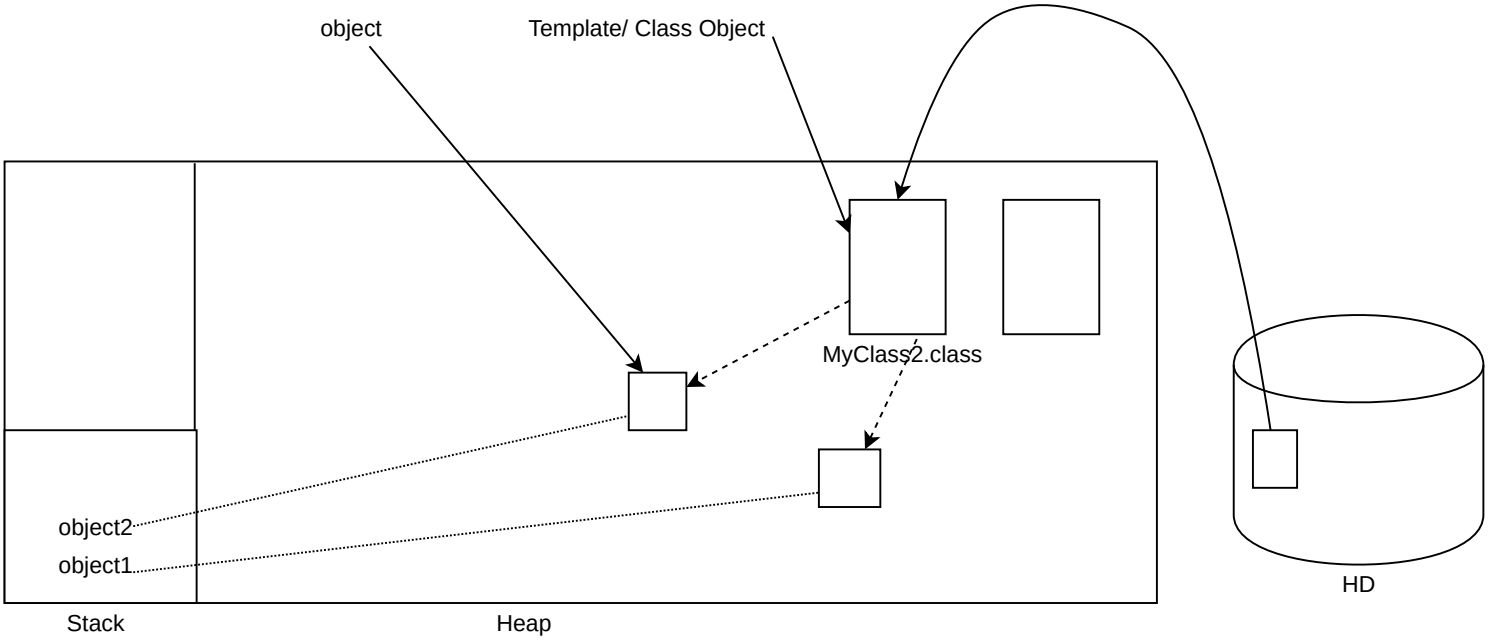
**Blue print of object**

```
public class TestClass {

}
```

## Objects

### Instance of class

```java
public class MyClass {
    public static void main(String[] args) {

        MyClass2 object1 = new MyClass2(); // create myClass2 object

        MyClass2 object2 = new MyClass2();

        object1.myMethod();

        object2.x = 200;

        object2.myMethod();
        object1.myMethod();
    }
}
```




### Constructor

```java
public class MyClass2 {

    public int x = 100;

    MyClass2(){ // constructor
        System.out.println("Java");
    }


    public void myMethod(){
        System.out.println("My Method....");
        System.out.println(x);
    }
}
```

**Constructor Overloading**

```
public class MyClass2 {
    public int x = 100;
    // constructor overloading
    MyClass2() {
        System.out.println("constructor");
    }
    MyClass2(String s) {
        System.out.println("constructor(String)");
    }
    public void myMethod() {
        System.out.println("My Method....");
        System.out.println(x);
    }
}
```

**Instance Block/ Non Static Block**

```
public class MyClass2 {
    public int x = 100;


    MyClass2() {
        System.out.println("constructor");
    }

    { // instance block
        System.out.println("block");
    }


    public void myMethod() {
        System.out.println("My Method....");
        System.out.println(x);
    }
}
```

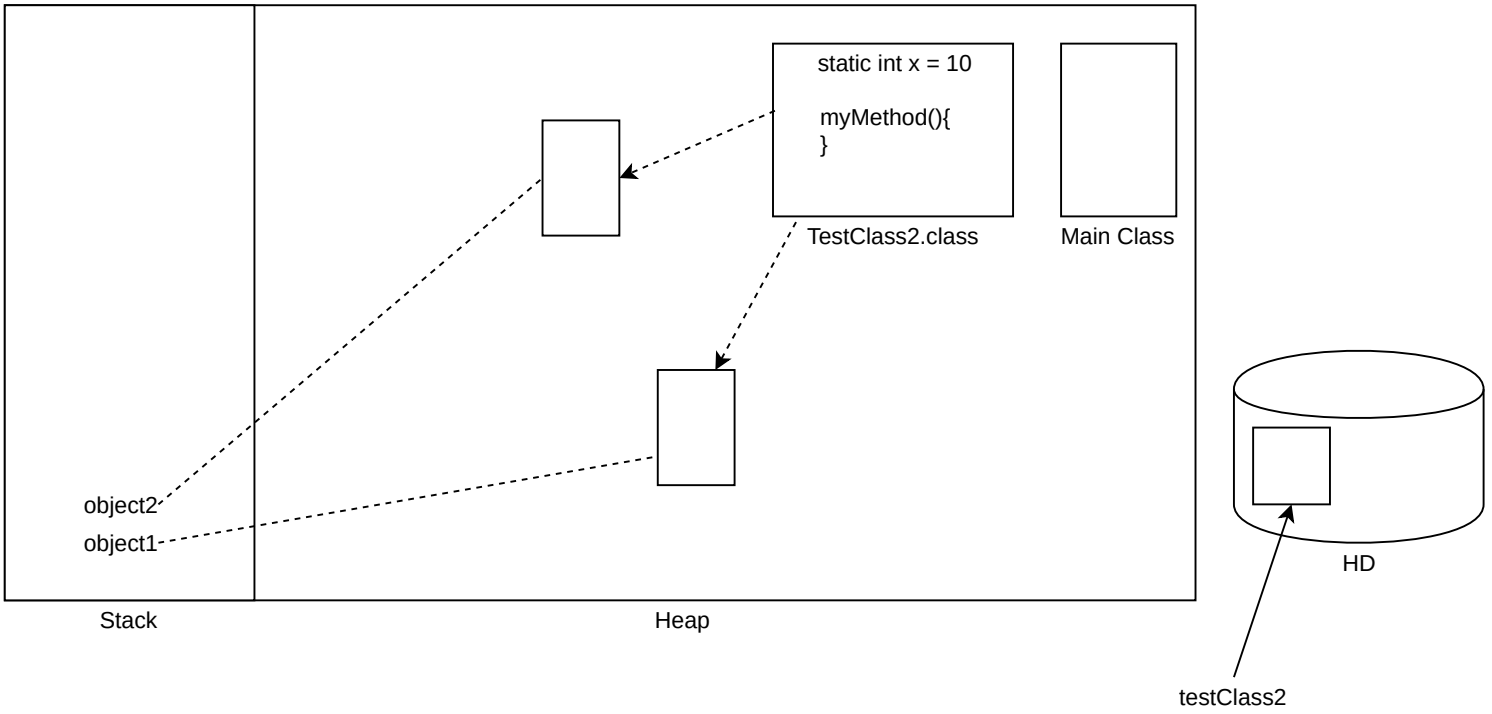
**Static Block**

```
public class MyClass2 {
    public int x = 100;
    MyClass2() {
        System.out.println("constructor");
    }

    {
        System.out.println("block");
    }

   static { // static block
       System.out.println("Static Block");
    }

    public void myMethod() {
        System.out.println("My Method....");
        System.out.println(x);
    }
}
```

**Static Key Word**

```java
public class TestClass2 {

    static int x = 10;

    public void myMethod(){
        System.out.println("My Method");
    }
}
```

```java
public class TestClass {
    public static void main(String[] args) {

        TestClass2 object1 = new TestClass2();

        System.out.println(object1.x);
        System.out.println("===========");

        TestClass2 object2 = new TestClass2();

        object2.x = 20;
        System.out.println(object1.x);
    }
}
```



**Access Modifiers**

```
public int publicVariable = 100; // public -- > every where in program
private int privateVariable = 200; // private --> only own class
protected int protectedVariable = 300; // protected --> same package and subclasses
int defaultVariable = 400; // package default --> same package
```

# Day-6

## OOP - Object Oriented Programing

1. **Encapsulation**
2. **Inheritance**
3. **Abstraction**
4. **Polymorphism**

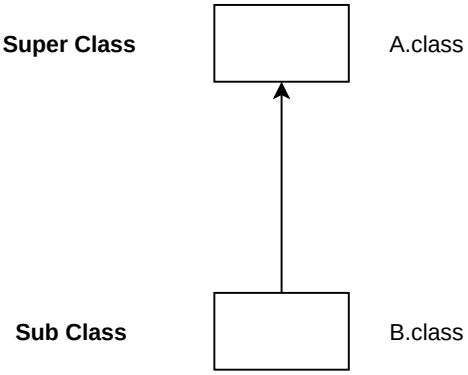
**Encapsulation** - Wrapup Data / Protect Data

How to fully encapsulate class(step by step)

1. Private varibales.
2. Create no arg constuructor and full arg construcor
3. Create setters and getters.

```
public class Student {
    private String id;
    private String name;
    private String address; // --> class variable,instance variable,attributes
    private String contact;
    private String nic;

    Student(){ // default constructor, no arg constructor

    }

    Student(String id,String name,String address,String contact,String nic){ // full arg construct

    }

    public void setId(String id){ // setter
        this.id = id;
    }

    public String getId(){ // getter
        return id;
    }
}
```

**Inheritance** - inhert attributes and method from one class to another class



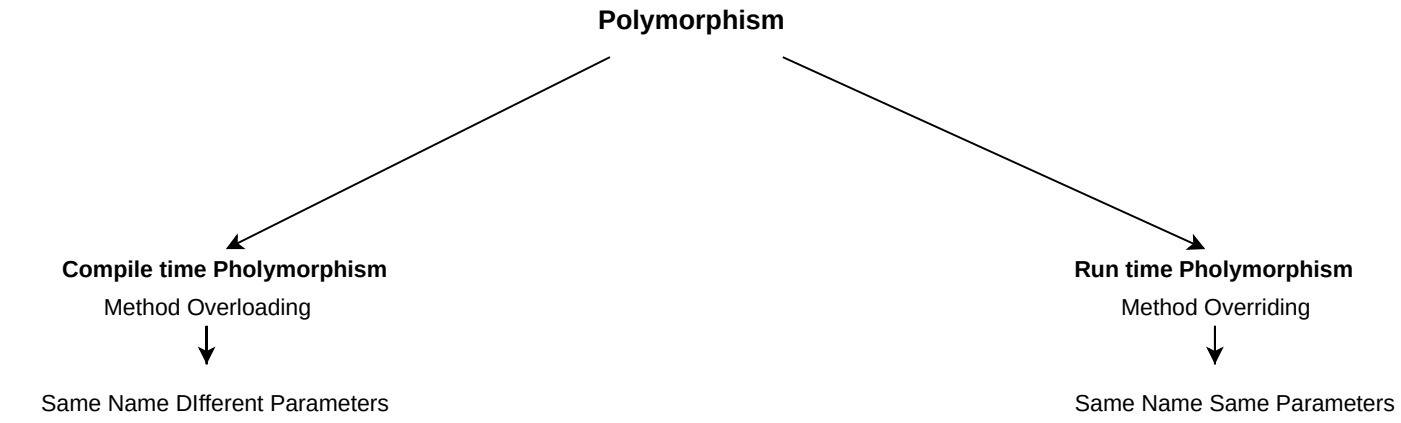

**Super Class**

```java
public class Animal {
    public String eyes = "eye";
    public String legs = "legs";
    public String head = "head";

    public void walk(){
        System.out.println("walk");
    }

    public void eat(){
        System.out.println("Eat");
    }
}
```

**Sub Class**

```java
public class Dog extends Animal{
    public void run(){
        walk();
    }
}
```

**Polymorphism** - SIngle Interface in many forms




```java
public class CompileTimePolymorphism {

    // method over loading
    public void myMethod(){

    }

    public void myMethod(int i){

    }

    public void myMethod(String s){

    }

    public void myMethod(int i,String s){

    }
}
```

Super Class

```java
public class Animal {
    public void move(){
        System.out.println("Move");
    }
    public void talk(){
        System.out.println("Talk");
    }
}
```

Sub Class

```java
public class Dog extends Animal{
    public void move(){ // override
        System.out.println("Run");
    }
    public void talk(){ // override
        System.out.println("Buh..Buh..");
    }
}
```

```java
public class Main {
    public static void main(String[] args) {
        // compile time
        CompileTimePolymorphism object = new CompileTimePolymorphism();
        object.myMethod(10,"Java","Hello");
        // run time
        Animal dog = new Dog();
        dog.move();
        dog.talk();
        System.out.println("======================");
    }
}
```

**Abstraction** - process of hiding details and showing information to the user.

1. Abstract method
2. Abstract Class
3. Fully Abstract Class

1. Abstract Method

```
public abstract void testMethod();
```

2. Abstract Class

```
public abstract class MyClass {
    public void myMethod(){
        System.out.println("My Method");
    }
    public abstract void testMethod();
}
```

3. Fully Abstarct Class

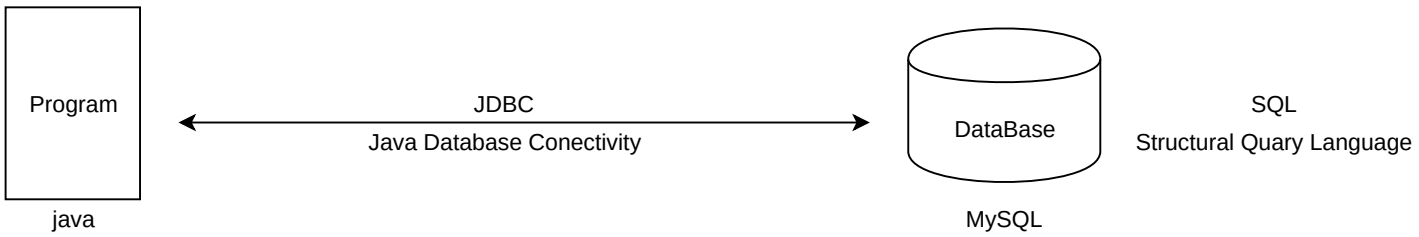
```
public abstract class MyClass {
    public abstract void testMethod();

    public abstract void myMethod();
}
```

## Fully Abstract Class = Interface

**Interface**

```
public interface Test {

    public void myMethod();

    public void tetMethod();
}
```

# Day-7



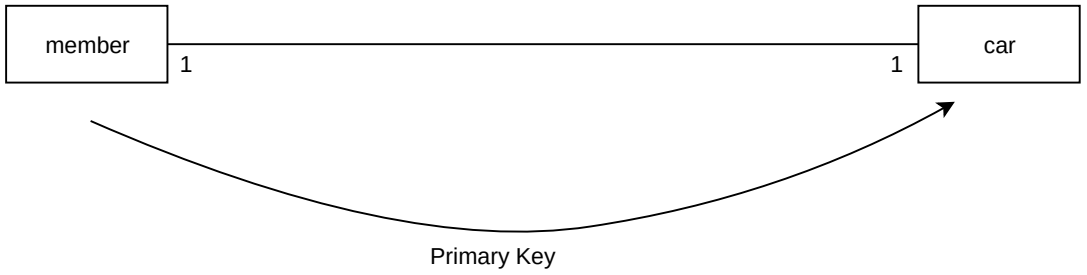

CRUD Operation

C - Create
R - Read/Retrive
U - Update
D - Delete

## Relational Data Base

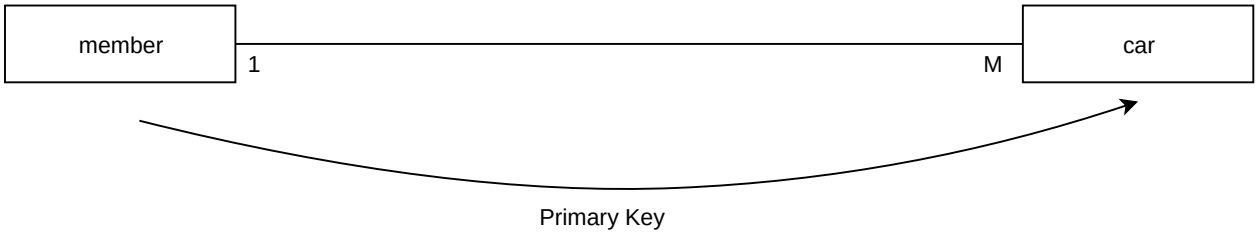
1. One to One
2. One to Many
3. Many to Many

**1. One to One**



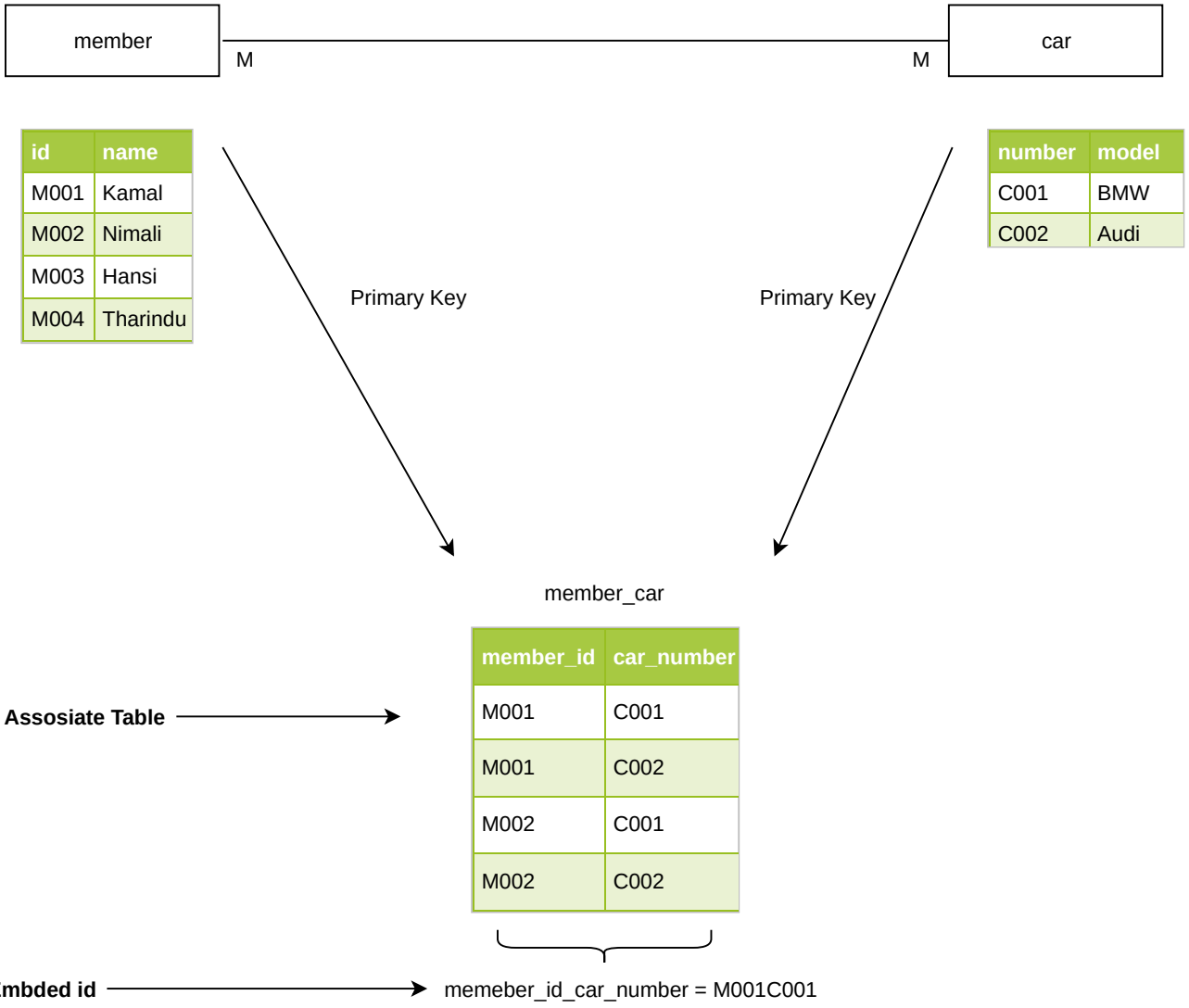
# Day-8

**2. One To Many**




**3. Many To Many**

One to Many + One to Many = Many to Many




| id | name |
|---|---|
| M001 | Kamal |
| M002 | Nimali |
| M003 | Hansi |
| M004 | Tharindu |

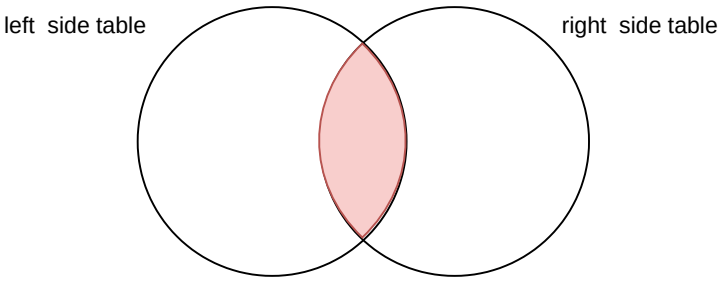
| number | model |
|---|---|
| C001 | BMW |
| C002 | Audi |

| member_id | car_number |
|---|---|
| M001 | C001 |
| M001 | C002 |
| M002 | C001 |
| M002 | C002 |

## Join Queries

1. Inner Join
2. Left Join
3. Right Join
4. Full outer Join

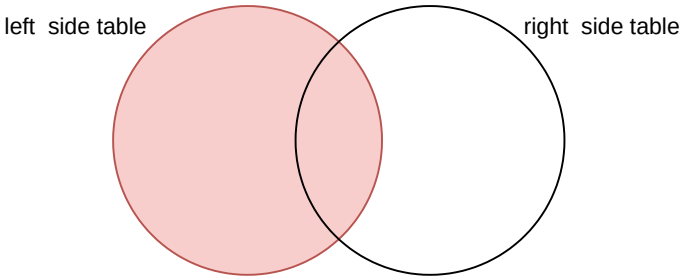
**1. Inner Join**




Return value that have matching value in both tables

---

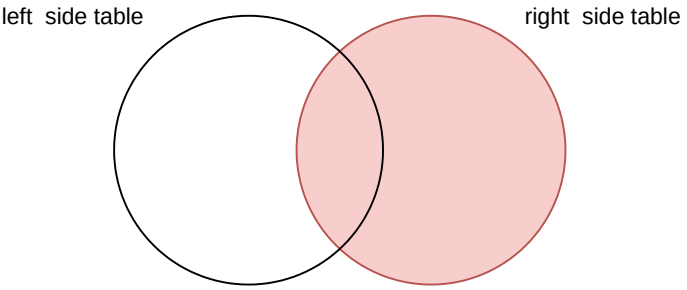
**2. Left Join**




Return all the record in the left table and matched recods in right table

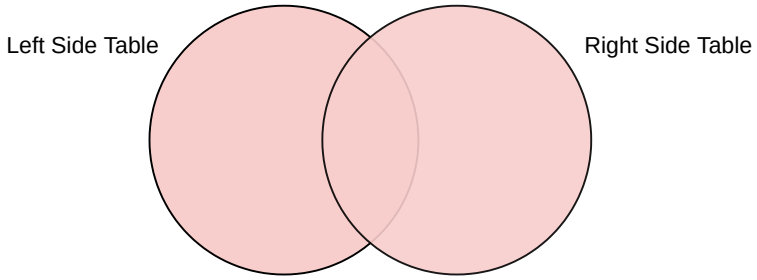
---

**3. Right Join**




Return all the record in the right table and matched recods in left table

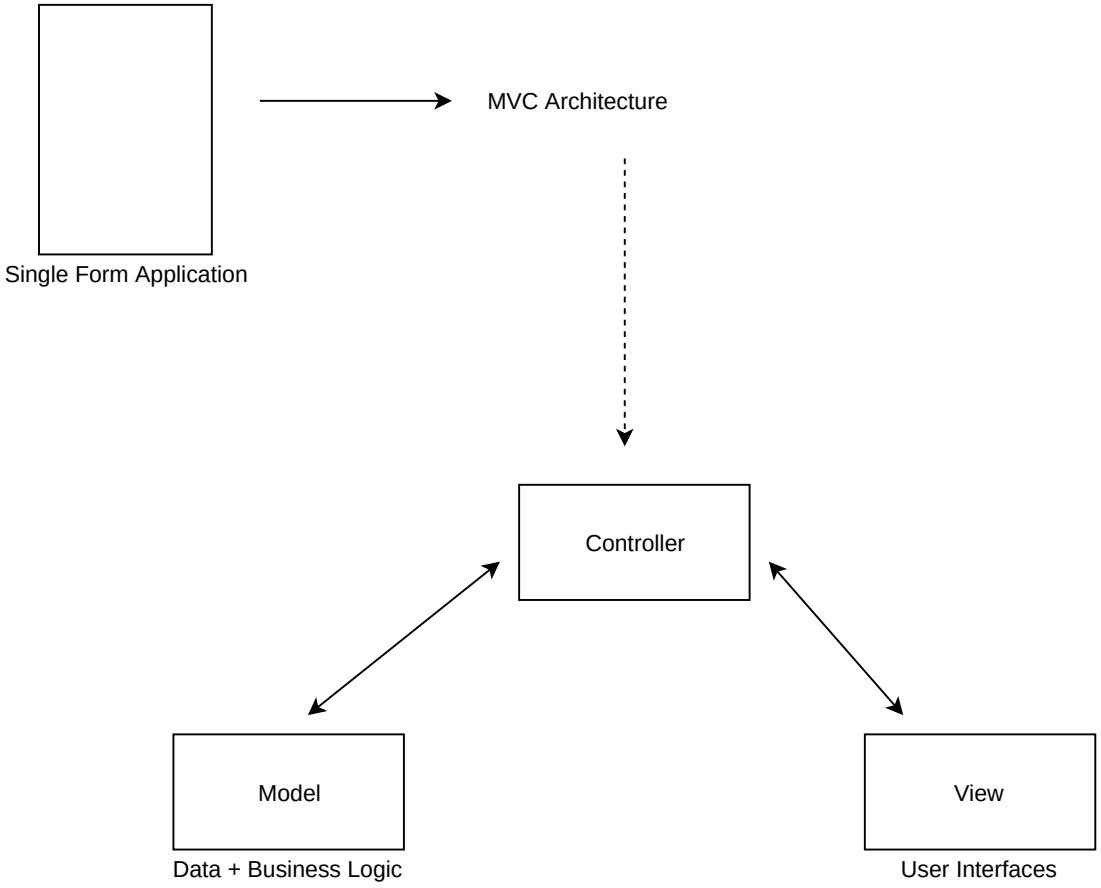
**4. Full Outer Join**



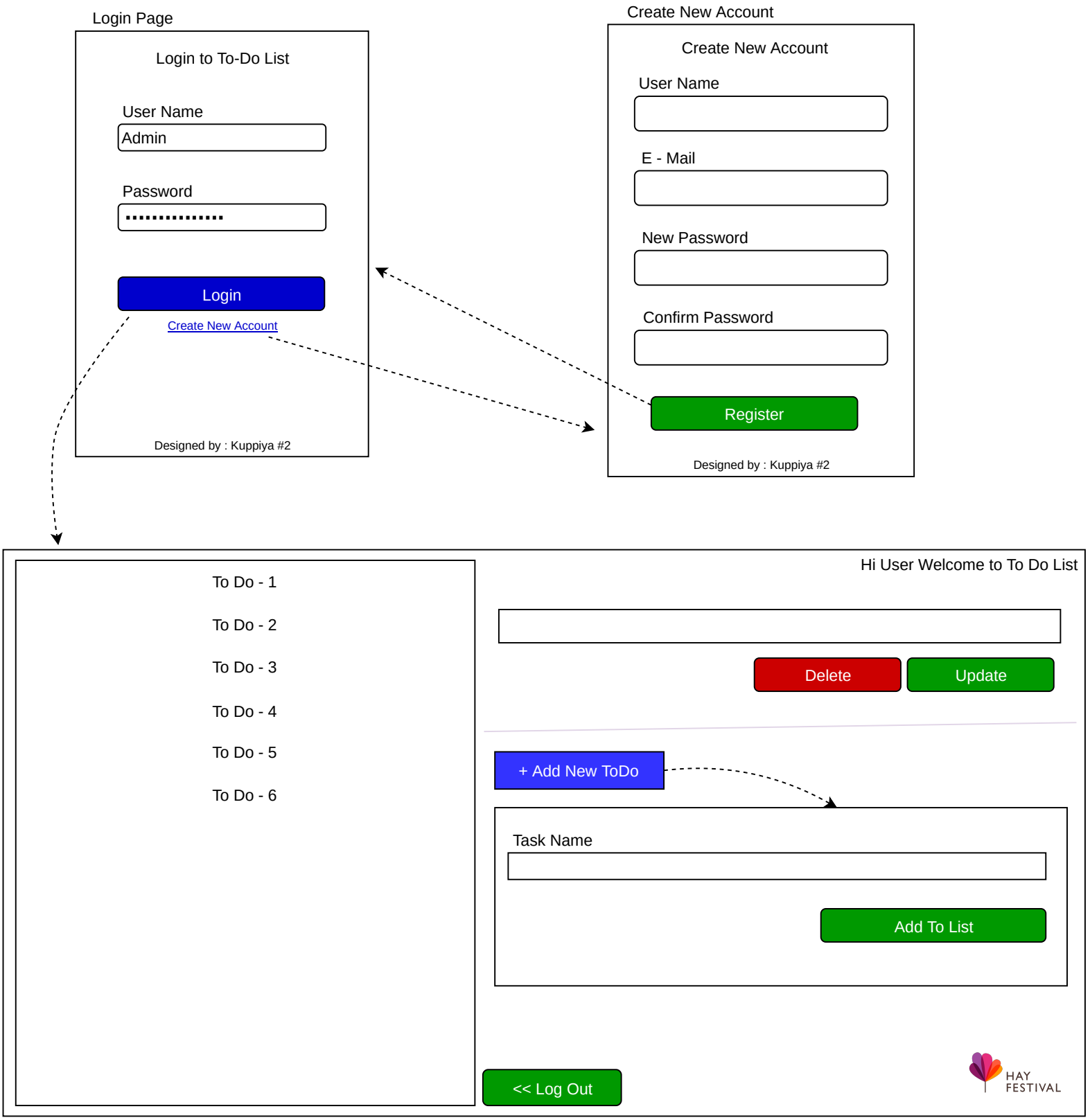

Return all the rocords when their is either matching in left or right table

---

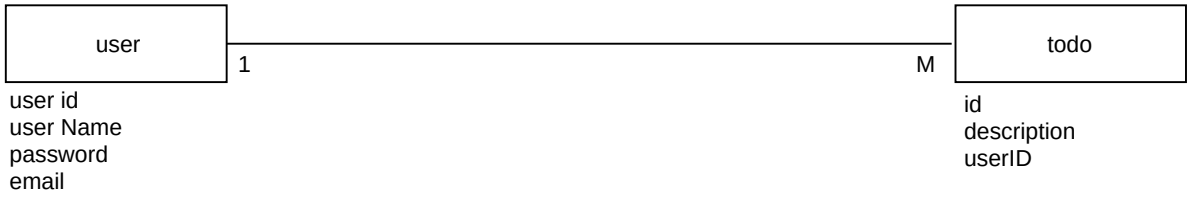
# Day-10



# Project With MVC Architecture (To Do List)




todoList




user id
user Name
password
email

id
description
userID