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COMP90041

Programming and Software Development

Tutorial 2 Data types & Input/output

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Admin

- ✓ Connect to remote server from home via Uni VPN
- ✓ Upload -> Submit -> Verify = Literally Submit
- ✓ Use Discussion Board
- ✓ Slides available at…

Slides available at

GitHub Repository:COMP90041_Tutorial

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Overview

1. Object Oriented Programming
2. Data Types
3. Output
4. Input
5. Exercises

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1. Object Oriented Programming(OOP)

What is OOP?(oops?)

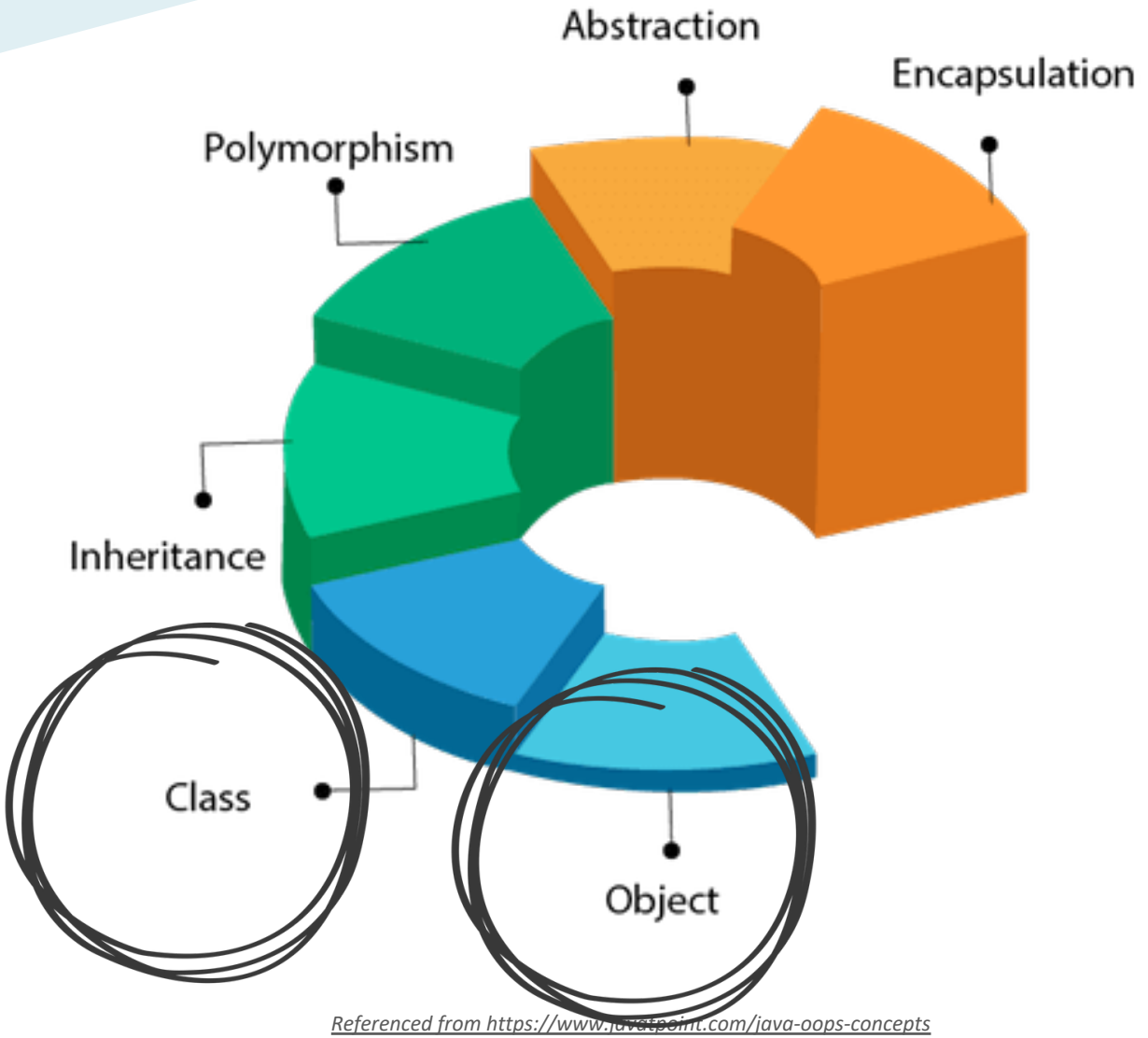
Wikipedia:

Object-oriented programming (OOP) is a programming paradigm based on the concept of “objects”, which can contain data, in the form of fields (often known as attributes or properties), and code, in the form of procedures (often known as methods). A feature of objects is an object‘s procedures that can access and often modify the data fields of the object with which they are associated (objects have a notion of “this” or “self”). In OOP, computer programs are designed by making them out of objects that interact with one another. OOP languages are diverse, but the most popular ones are class-based, meaning that objects are instances of classes, which also determine their types.....

What is OOP?

combine a group of related variables and functions into a unit

OOP Properties



Referenced from https://www.javatpoint.com/java-oops-concepts

Example

Scrabble Game

Fight the Landlord

Player Class

Properties

Functions

Player.java

```java
package tute2;
/**
 * introduce classes and objects
 */
public class Player {
    String name;
    int age;
    int score;
    public Player(String name, int age) {
        this.name = name;
        this.age = age;
    }
    public void introduceSelf(){
        System.out.println("Hello, my name is " + this.name);
    }
    public void putCharacter(char input){
        //
    }
    public void requestVoting(){
        //
    }
}
```

Player Object

Player.java × GameEngine.java ×

```
1   package tute2;
2
3   public class GameEngine {
4       public static void main(String[] args) {
5           Player p1 = new Player( name: "michale",  age: 25);
6           p1.introduceSelf();
7           p1.putCharacter( input: 'a');
8           p1.requestVoting();
9       }
10  }
```

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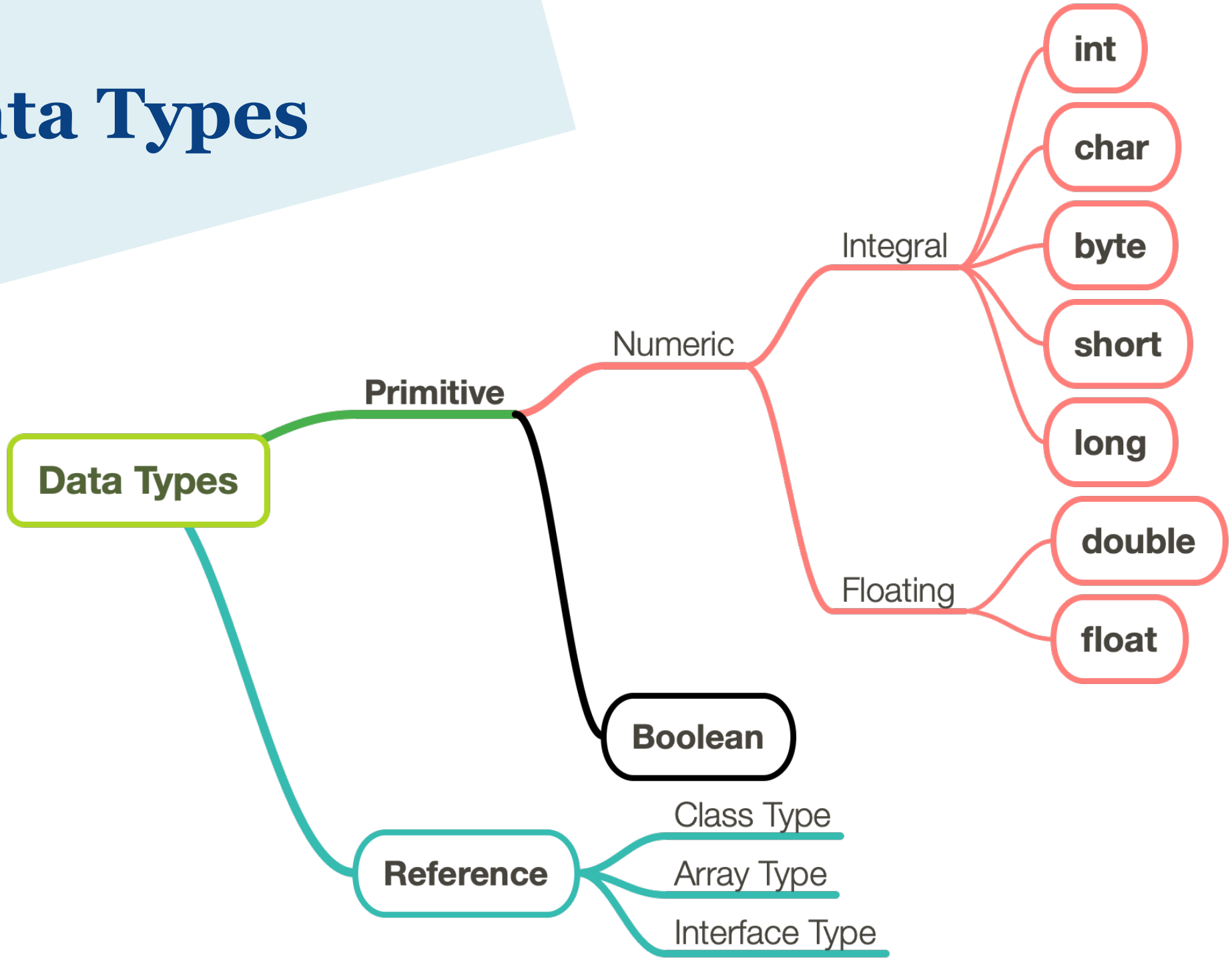
2. Data Types

Data Types


Data Types
Primitive
Numeric
Integral
int
char
byte
short
long
Floating
double
float
Boolean
Reference
Class Type
Array Type
Interface Type

Data Types

Questions:

1. **Primitive** Types VS **Reference** Types?

2. What is **Type Casting**?

Primitive & Reference Types

Primitive variables:

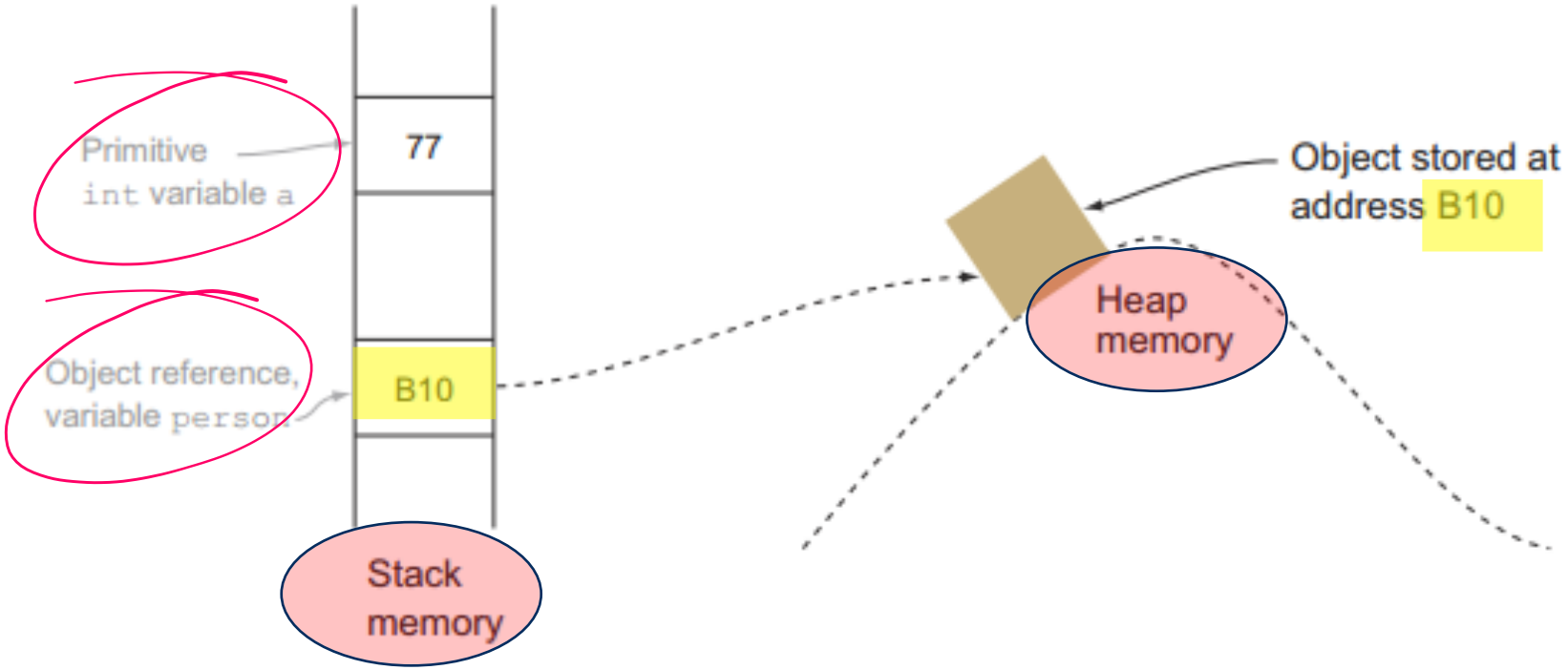
store the actual values

Reference variables:

store the addresses of the objects they refer to

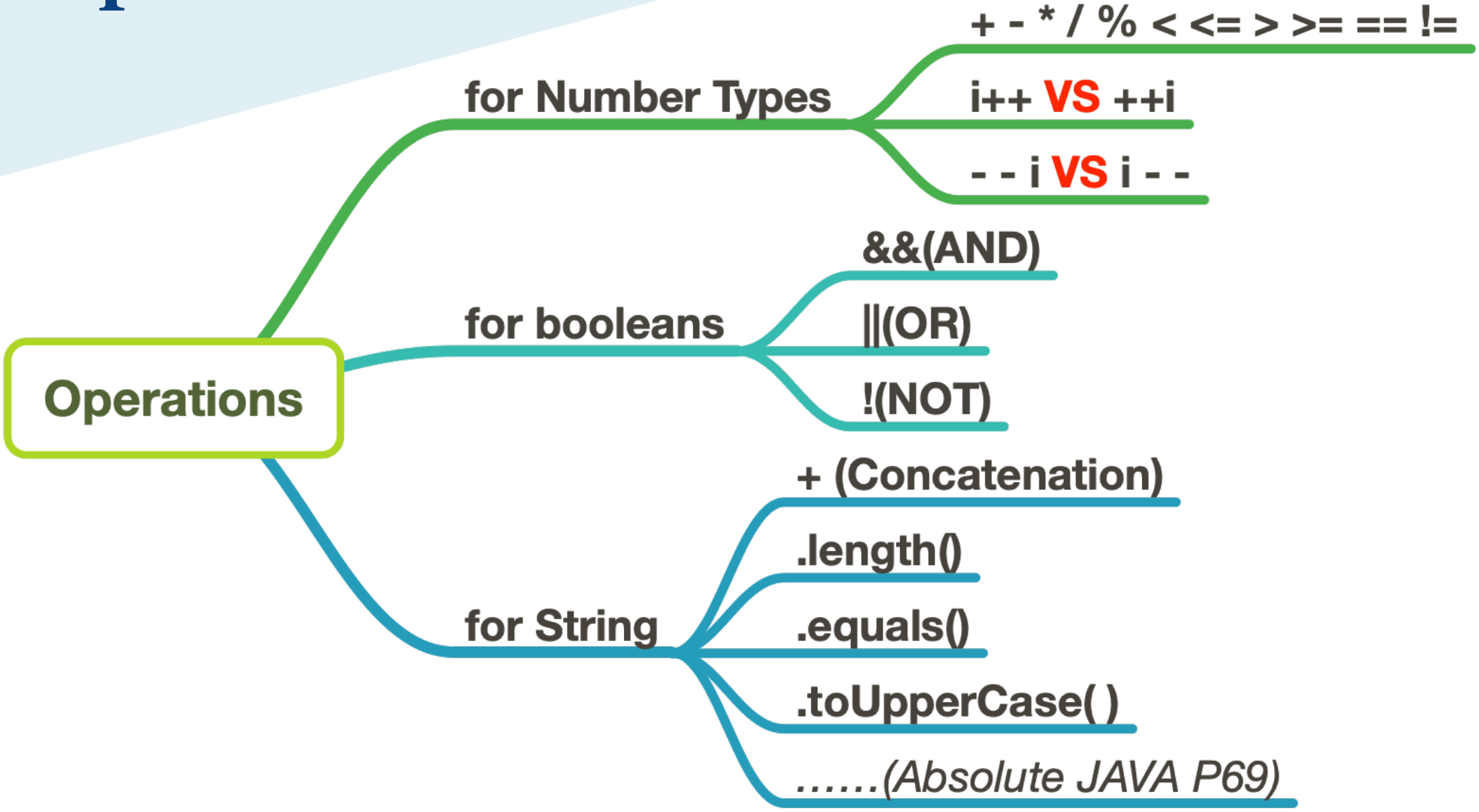
Primitive & Reference Types

```
int a = 77;
Person person = new Person();
```



Referenced from https://stackoverflow.com/questions/8790809/whats-the-difference-between-primitive-and-reference-types

Operations


Operations
for Number Types
+ - * / % < <= > >= == !=
i++ VS ++i
- - i VS i - -
for booleans
&&(AND)
||(OR)
!(NOT)
for String
+ (Concatenation)
.length()
.equals()
.toUpperCase( )
……(Absolute JAVA P69)

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3. Output

Output

```
// The next output is placed on the same line
System.out.print("Adele");

// The next output goes on a new line
System.out.println(" Hello, it's me");

// Formatted output
System.out.printf("Album %5.2f", 25.0);
```

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4. Input

Input

```
1     import java.util.Scanner;
2
3     Scanner keyboard = new Scanner(System.in);
4
5     keyboard.nextInt();
6
7     keyboard.nextDouble();
8
9     keyboard.next();
10
11    keyboard.nextLine();
12
13    ...(Absolute Java P113)
```

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5. Exercises

Tutorial Exercise

Write a java program that reads in a single line of text from the user, prints out how long it is (in characters), on the next line prints out just the first word of the user's text, and on the third prints all of the user's input but the first word. Assume that words are separated by a single space character.

Homework

Write a java program that prints out the first command line argument between quote characters on a line by itself. You can ignore any command line arguments after the first, and don’t worry that the program will crash if you don’t give it any command line arguments.

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Thank you