Recap

`public static void main(String[] args)`

- public - Java's main function requires a public access modifier
- static - Java's main method is static, which means no instances need to be updated beforehand to invoke it
- void - Java's main function is void, which means it does not return any value when it complete
- main - When the JVM starts a standalone application, the main method is the function that gets invoked
- String[] - An array of configuration parameters to be used by the application and can be passed into the main function as arguments.
- args - The configuration parameters passed into the main function in Java are typically named args

Packages

> **Definition**
>
> Mechanism required to fully specify class

- Allows use of classes with the same name in the same project
- Programmers can determine that the classes are related
- Java uses filesystem directories to store packages
- Use Keyword import to import packages in Java

Access Modifiers

> **Definition**
>
> Used to set the accessibility (visibility) of classes, interfaces, variables, method, constructors, data members, and the setter methods

- Default (Package Private) - Declarations are visible only within the package
- Private - Declarations are visible within the class only
- Protected - Declarations are visible within the package or all subclasses
- Public - Declarations are visible everywhere

Attributes / Class Attributes / Class Members / Class Fields

Definition

- Represent variables of data within a class
- Defines the properties of objects created from that class

Example

```
public class Rectangle extends Object {
    // properties, characteristics, member data/variables
    int m_length = 6;
    int m_width = 12;
    int m_area; // consistency/maintainence issue
    static String name = "rectangle";

    int area() {
        return m_length + m_width;
        return area; // not good
    }

    @Override
    public String toString() {
        return m_name;
    }

}
```

Methods

Definition

Blocks of code that perform specific tasks, encapsulating functionality to make code more organized and modular

Tip

Static methods can be accessed without creating an object of the class

Warning

Instance (non-static) methods can only be accessed via objects

Object Oriented Programming

- Code is organized around objects, which are instances of classes that contain both data and methods
- Classes define the properties (attributes) and behaviors (methods) of object
- Objects can interact with each other through methods
- Several advantages
  - provides a clear program structure
  - helps to keep Java code DRY (Don't Repeat Yourself) and makes the code easier to maintain, modify, and debug

Procedural Programming

- Code is organized around procedures or functions but not objects
- Procedural programming is about writing procedures or methods that perform operations on the data