

Féidearthachtaí as Cuimse
Infinite Possibilities



2 Java code intro

Object Oriented programming

Java Overview

- OO programming
- Classes vs Objects
- Class in Java

Objects and OO programming?

- What's good about it?
- What's the gain? (compared to procedural programming, e.g. C)
- Classes? Objects?
- How do you know what the classes should be when you're developing?

Procedural Programming

- C
- Instructions are in steps
- Functions are used e.g. `calculate_wages()`
- Like following steps of a (long) recipe



Object Programming

- Java, Python*, C++, Ruby, Kotlin...
 - OOP Advantages
 - Reusing code (inheritance, classes etc)
 - Organising code
 - Security (encapsulation)
 - And more – scalability, maintainability.. Etc
- More to follow**

Objects and classes

- Crucial to understand these
- A class is just the **template**
 - In itself – (usually) doesn't do anything
 - Why bother? (Example : Housing estate)
 - ,
- To use, create “objects” from the class (called **instantiating** objects)

Start with Java class

- Basic class definition

```
class className
{
    // attributes
    ...
    // methods
    ...
}
```

Attributes and methods together are called “class members”

Sample java class

- **Person** class

How do you describe a person (i.e. attributes)

- e.g. name.. what else?

- What types of things might it do? (i.e. “behavior” or methods)

Python vs Java

Person class – what to note?

- Differences with writing the same class in Python?
- Note:
 - Class name (with capital letters)
 - Access modifiers
 - Data types (*static typing in java, dynamic in python*)
 - Methods (if any)
 - Constructor
 - Comments

Java classes

- To **run** a java program, need a **special method** called the **main** method to tell the program where to start executing
- Put the “main” method in its own class OR as a method in an existing class (if just using one class).

```
public static void main (String [] args)
{
    // e.g.      ..
}
```

Constructors

- Used to create objects for a class
 - May need more than one in a class (why?)

- e.g.

```
Person boy1 = new Person();
```

```
Person boy1 = new Person("John");
```

```
Person boy1 = new Person("John", "Murphy");
```

- Code: multiple constructors

Write your own code

- A hospital A&E system checks in and manages patients. Write a class in java to represent a “Patient” on the system
- Put in at least 3 attributes
- Add 2 constructors
- Instantiate a (“real”) patient object