

Classes and Objects

Zarina Shukur

Our world consists of objects of
different classes

Objects and Classes in Multimedia Hall

- I am **Zarina** and I am a **Person**.

Mineral Water Bottle Case Study



Attributes of Objects (1)



Attributes of Objects (2)



Static vs Dynamic Attributes

- Static attributes:
 - Bottle: brand, volume, color
 - Normally, it WILL NOT CHANGE OVER TIME.
 - Attributes values are set at production phase.
- Dynamic attributes:
 - It always changes from time to time.
 - Bottle: fill, cap
 - The default values are set at production phase.
 - Bottle: bottle close (cap=TRUE), bottle full (fill = 100%)
 - Some **events** will change the value of dynamic attributes.
 - open-bottle
 - pour-water
 - refill-bottle

Class Mineral Water Bottle

- Static attributes: brand (string), volume (integer), color (string)
- Dynamic attributes: cap (boolean), fill (integer)
- Public Methods: open-bottle, close-bottle, drink-water, fill-bottle
 - Supporting method: bottle-info, bottle-status
- Private Methods: get-cap, get-fill, set-cap, set-fill

Refining methods

- Public Methods:
 - open-bottle → cap=FALSE
 - close-bottle → cap=TRUE
 - pour-water(x) → fill = fill – x; //make sure it is not negative, bottle is open
 - fill-bottle(x) → fill = fill + x; //fill <= volume
- Supporting method:
 - bottle-info → display all static info
 - bottle-status → display all dynamic info
- Private Methods:
 - get-cap, get-fill, set-cap, set-fill

Instance of Mineral Water Bottle

- Object First Bottle
 - Static attributes: brand (Cactus), volume (500ml), color (blue)
 - Dynamic attributes: cap (ON), fill (100%)
- Object Second Bottle
 - Static attributes: brand (Spritzer), volume (1000ml), color (green)
 - Dynamic attributes: cap (ON), fill (100%)

Application of MWBottle

- Create two bottles
 - First bottle: cactus, 500ml, blue
 - Second bottle: Spritzer, 1000ml, green
- Pour half of second bottle
 - open-bottle, pour-water($0.5 * \text{volume}$), close-bottle
- Fill first bottle with 50 ml water
 - open-bottle, fill-water(50), close-bottle

How to implement classes and
objects in Java?

We *create* class,
then, we *instantiate* object

Demo

MWBottle.java

```
public class MWBottle {  
}  
}
```

compile

```
11010110101  
01010111011  
10001001100  
10111101100  
00101101010
```

MWBottle.class

MWBottleApps.java

```
public class MWBottleApps {  
}  
}
```

compile

```
11010110101  
01010111011  
10001001100  
10111101100  
00101101010
```

MWBottleApps.class

run



Bank Account Case Study

When you first time open a bank account ... you
need to provide some info (static info)

Create Class BankAccount

Instantiate BankAccount Object: MyAccount

Recap ...