Class/object example: Constructors
COMP 102

Victoria University of Wellington

Setting up an object

- How do you initialise the values in the fields?
  - Can specify an initial value in the field declaration
    but only if every object should start with the same value!!!

- Must have a way of setting up *different* objects when you create them:

  Constructor:
  - specifies what happens when you make a new object
    (eg, evaluate the expression
      new CartoonCharacter(150, 100, "alice")

CartoonCharacter class

```java
public class CartoonCharacter {
    // fields
    private double figX, figY;           // current position of figure
    private String direction = "right";  // current direction it is facing
    private String emotion = "smile";    // current emotion
    private String imagePrefix;          // folder where images stored
    private double wd = 40,  ht=80;      // dimensions

    // constructor
    public CartoonCharacter(double x, double y, String prefix){
        this.imagePrefix = prefix;
        this.figX = x;
        this.figY = y;
        this.draw();
    }

    // methods …….

    public void lookLeft() {
        this.erase(); …..
```
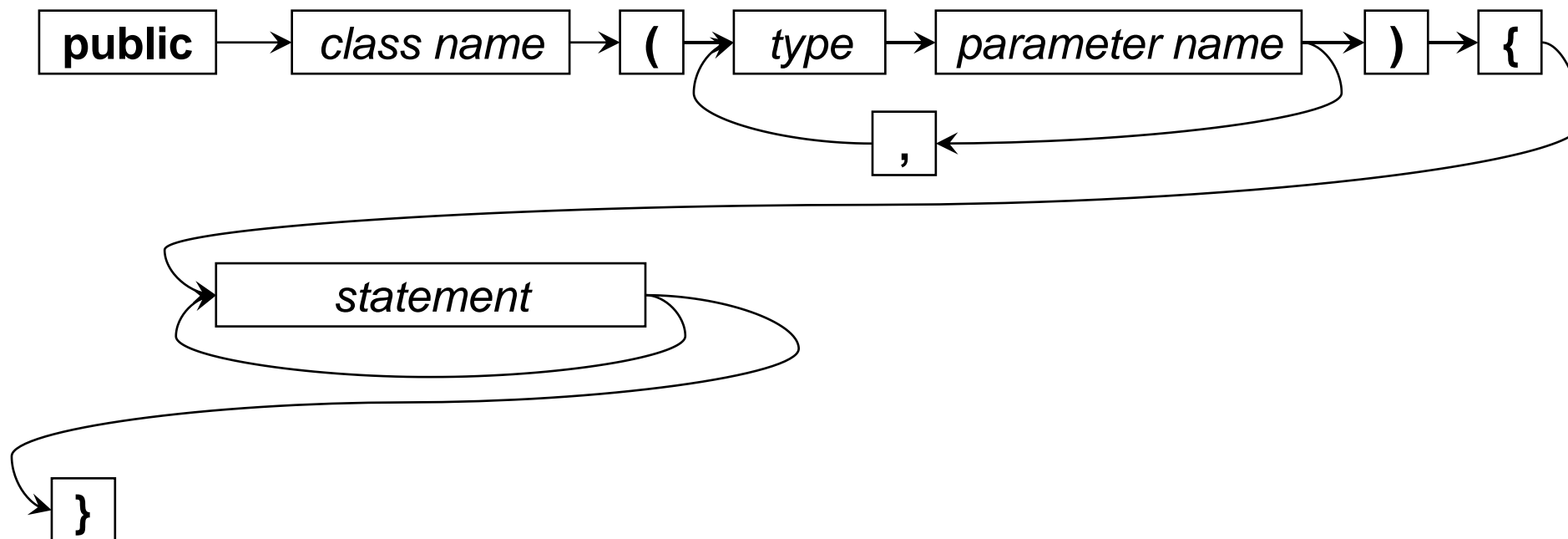
Syntax of Constructor Definitions

public → *class name* → **(** → *type* → *parameter name* → **)** → **{**

,

statement

}

public CartoonCharacter(String base, double x, double y){
    this.imagePrefix = prefix;
    this.figX = x;
    this.figY = y;
    this.draw();
}

Constructors

- Defining a Constructor
  - Part of the class

  - Like a method, but called with **new**

  - Does not have a return type

    (**new** always returns an object of the given type)

  - this will hold a reference to the new object that is being constructed

    - You can use this when you need information or perform actions on the current object

- Constructor typically
  - fills in initial values of fields
  - may call other methods on the object,
  - can do anything an ordinary method can do.

What happens with **new** ?

When an object is created

eg cf1 = **new** CartoonCharacter(100, 200 , "bob");

- New chunk of memory is allocated
  (new filing card).

- Reference (ID) to object is constructed
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- Any initial values specified in the field
  declarations are assigned to the fields.
  If no initial value, default values:
  - 0 for fields of a number type (int, double, etc)
  - false for for boolean fields
  - null for fields of an object type (String, Scanner, Car, …)

- The arguments are passed to the constructor

- The actions specified in the constructor are performed on the object.

- The reference is returned as the value of the constructor. (cf1 is assigned the reference)

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figX:	
figY:	
emotion:	" "
direction:	" "
imagePrefix:	
wd:	.
ht:	.