
COMP102

COMP 102 2022 T1

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My contact details

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- Office hour
 - Wed 11-12
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- My main duties
 - Thursday and Friday lectures
 - A8, A9, A10
 - Some exam questions

Week 9

- Event-driven programming (GUI: Graphical User Interface)
 - Button
 - Mouse
 - Slider
 - Text field

- A8: minipaint
 - One class
 - New topic

- More on ArrayList, lead to A9.

Week10

- ArrayList of objects
- Array and Array of objects
- A9
 - Q1, WaveFormAnalyser, ArrayList of Doubles
 - Drawer (read data from a file, how to use the numbers in a for each loop and plot)
 - ArrayListE (how to change the numbers on ArrayList)
 - ArrayList of objects; Array of objects

ArrayList of objects

- Objects and its class
- Design: A program with two classes
 - GhostStory and Ghost
 - PetShow and Animal
 - BallGame and Ball
 - FloorCleaner and Robot
- An example
 - TutorList and Tutor

Objects and its Class

- Alex, 3000567, Bsc
- Bob, 3000897, BE
- Tom, 3003030, BA

- Toyota, auto, 2013, blue
- Honda, manual, 2021, white
- BMW, auto, 2022, black

- A1, 80
- A2, 90
- A3, 85

Objects and its class

- Blinky, 100, 200,50,50
- Pinky, 200, 300, 50, 50

- Bird, coco,100,200
- dinosaur, d1, 200, 300
- dog, woffy, 50,300

- 200,100
- 20,50

- 50, 100, 200, blue, left,
- 20, 200, 300, yellow, right

Example: Tutors and their payment

- Objects
 - Sam, 20
 - Tom, 5
 - Zoe, 15
- Tasks:
 - Add a tutor and its hours
 - Print all tutor names
 - Print payslip for all tutors
- Its class
 - Tutor
- Add hours for one tutor
- Print the total hours
- Find the tutor who worked the most hours

Design

- TutorList class

- Fields
- Methods

- Tutor class

- Fields
- Constructor
- methods

GhostStory and Ghost
PetShow and Animal
BallGame and Ball
FloorCleaner and Robot

Week 11

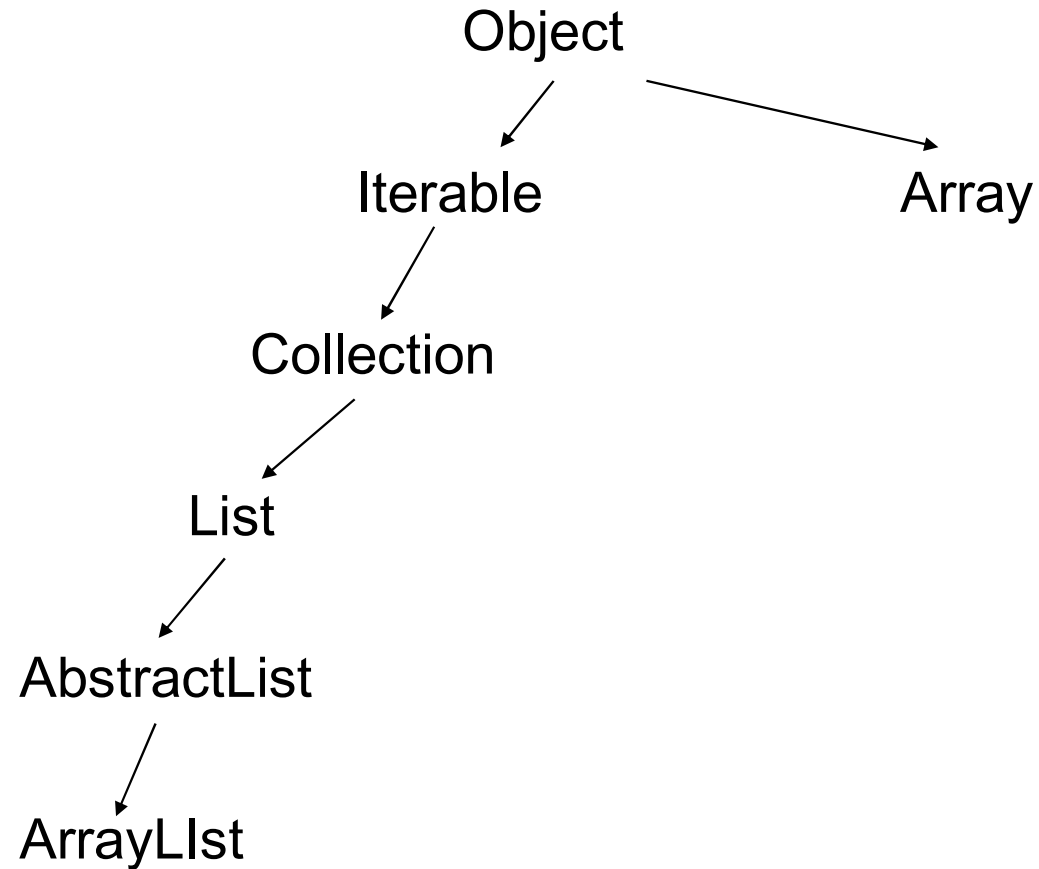
- Array, especially 2D array
- A10

- Differences between
 - List and ArrayList
 - ArrayList and Array, Why Array?

- Array exercises

- 2D array exercises

Hierarchical structure



Differences between List and ArrayList

- List is not a real class, it is an Interface (no constructor, no method body).

- Where we use list

```
static List<String> readAllLines(Path path) Read all lines from a file.
```

- e.g. List<String> lines = Files.readAllLines(Path.of("data.txt"));
- ArrayList is a List, it implements a List, it is a real class
 - We use ArrayList for a sequence of data
 - A sequence of Indexed places

Differences between ArrayList and Array

- ArrayList

- The size can change
- Continuous
- Many methods to call

- Array

- The length is fixed
- Can be null (empty place)
- Field : length
- Use []

- When do we use Array

- Fixed size data structure
 - Board game: 3*3, 19*1
- The index can have meanings,
 - Hotel room number
 - House number on a street
- null value makes sense
 - Some rooms are vacant
 - Some numbers do not have a house

Array Exercises

- Declare an array, initialise an array

```
int [ ] nums = new int[ ]{10,20,4,6,9,30};
```

```
char [ ] letters = new char[ ] {'A','B','X','O'}
```

```
String[ ] names = new String[ ] {"Bob","Zoe","Sam"};
```

```
double [ ] numbers = new double[20]
```

```
Card[ ] hand = new Card[5];
```

- Access (get and set) an element

```
UI.println(nums[1]);
```

```
nums[3] = nums[1] + nums[2];
```

- for loops

```
for (int i=0; i< nums.length; i++){
```

```
    UI.println(nums[i]);
```

```
}
```

