

4.10 Implementing ArrayList Algorithms

Name: _____ Class: _____ Date: _____ Total: 8 marks

KEY WORDS array 数组 • arraylist 动态数组

Objective

Build the skills to answer exam questions on **implementing ArrayList algorithms**.

You must be able to:

- compute a sum, average, minimum, or maximum over an **ArrayList**
- **count** or **filter** elements that meet a condition
- insert or delete elements

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Summarizing an ArrayList

Just like an array, but using **get** and **size**:

```
int sum = 0;
for (int x : list) sum += x;
```

■ Counting, inserting, deleting

Use an **if** inside the loop to **count** matching elements. Use **add(index, value)** to **insert** and **remove(index)** to **delete**.

2 Practice

2.1 Describe how to sum the elements of an ArrayList. [1]

2.2 For an ArrayList holding [3, 6, 9], find the sum. [1]

2.3 Name the method used to remove an element at a given index. [1]

3 Exam-style questions

3.1 To count elements meeting a condition in an ArrayList, you use a loop with [1]

- **A** no condition
- **B** an **if**
- **C** a cast
- **D** a constructor

3.2 `list.remove(0)` [1]

- **A** adds an element
- **B** removes the first element
- **C** returns the size
- **D** sorts the list

3.3 An ArrayList `list` holds [10, 20, 30].

(a) Find the sum of its elements. [1]

(b) State `list.size()`. [1]

(c) Name the method that adds 40 to the end. [1]

Solutions

2.1 start a total at 0 and add each element as you loop through the list.

2.2 $3 + 6 + 9 = 18$.

2.3 remove.

3.1 B.

3.2 B.

3.3 (a) 60. (b) 3. (c) add.