

This exam scores code against specific behaviours: the loop bound, the return, the signature. Everything below is a rule the readers apply. 本科按具体行为评分: 循环边界、返回值、方法签名。

How the readers score free-response code

- ✗ Writing an outline of the method in comments.
- ✓ Write compilable Java. Structure must clearly convey intent.

The guidelines award points where the structure conveys intent – a comment describing intent is not code.

要写可编译的代码SG 8 years
- ✗ Printing the result where the signature says return.
- ✓ Return the value. If the method is void, print; otherwise do not.

A method that prints instead of returning does not do what the signature promises, whatever the logic inside.

看方法签名决定 return 还是 printCED 1.7
- ✗ Changing the method signature to something easier.
- ✓ Use the header exactly as given, with the same parameter types and order.

The header is part of the question, and a different one cannot be called by the tests the readers imagine.

方法签名不能改CED 3.4
- ✗ Declaring a new array and copying nothing into it.
- ✓ Copy the elements across; do not remove or overwrite the original.

The guidelines withhold the point from responses that remove or overwrite data instead of copying it.

复制数组不要破坏原数组SG2023
- ✗ Adding a semicolon or a separator at the end of a built string.
- ✓ Build it so the final element carries no trailing separator.

The guidelines state responses do not earn the point if they end the constructed output with a separator.

拼接字符串末尾不要多余符号SG2023
- A response can still earn later points after an earlier error. Write every method, even when one has defeated you.

每个方法都要写SG 3 years

2 · Selection and Iteration 选择与迭代

- ✗ Looping to '`<= length`'.
- ✓ Valid indices run from 0 to '`length - 1`', so the condition is '`< length`'.

The off-by-one throws an out-of-bounds exception, and the guidelines withhold the point for bounds errors.

下标从 0 到 `length-1`SG 2 years

- ✗ Stopping the loop before the last element.
- ✓ Check that the final element is visited – the guidelines require ALL elements to be accessed.

Missing the last element is invisible in most test data and fails the criterion outright.

循环要覆盖最后一个元素SG2023
- ✗ Reversing the loop bounds when traversing a 2-D array.
- ✓ Rows outer, columns inner – and keep the same order in every nested loop.

The guidelines list reversing the loops among the responses that do not earn the point.

二维数组行外列内SG2023
- ✗ Removing from an ArrayList inside a forward loop.
- ✓ Loop backwards, or adjust the index after each removal.

Each removal shifts the remaining elements, so a forward loop skips one every time.

正向遍历删除会跳过元素CED 4.4

1 · Using Objects and Methods 使用对象与方法

- ✗ Comparing Strings with '`==`'.
- ✓ Use '`equals()`' – '`==`' compares references, not contents.

The comparison silently returns false for equal strings built separately.

字符串比较用 equalsCED 1.5
- ✗ Writing '`array.length()`' or '`string.length`'.
- ✓ An array has '`length`'; a String has '`length()`'.

The two differ by a pair of brackets and neither compiles as the other.

数组用 `length`, 字符串用 `length()`CED 1.4
- ✗ Assuming integer division gives a decimal.
- ✓ '`7 / 2`' is 3. Cast to double when you need 3.5.

The truncation is silent and propagates through every later calculation.

整数相除会截断CED 1.3
- ✗ Calling an instance method as though it were static.
- ✓ Create the object first, then call the method on it.

The distinction is course content and the call does not compile.

实例方法要通过对象调用CED 1.6

3 · Class Creation 类的创建

- ✗ Assigning constructor parameters to local variables instead of the instance fields.
 - ✓ **Assign to ‘this.field’, so the object keeps the value.**
 - The object is then constructed with default values and every later method returns the wrong thing.
 - 构造器要赋值给实例变量 CED 3.3
 - ✗ Making every field public to save writing accessors.
 - ✓ **Keep the fields private and provide the accessors the question names.**
 - Encapsulation is assessed content in this unit.
 - 字段应设为 private CED 3.6
 - ✗ Calling a superclass method with the wrong name or arguments.
 - ✓ **Use ‘super.method()’ with the signature the parent declares.**
 - The guidelines allow other points to survive an incorrect ‘super’ call, but that point is lost.
 - super 调用要与父类签名一致 SG2023
- ### 4 · Data Collections 数据集合
- ✗ Declaring an ArrayList of primitives.
 - ✓ **Use the wrapper type: ‘ArrayList<Integer>’, not ‘ArrayList<int>’.**
 - A collection holds objects, and the primitive form does not compile.
 - 集合要用包装类型 CED 4.2
 - ✗ Comparing 2-D array dimensions in the wrong order.
 - ✓ **‘arr.length’ is the number of rows; ‘arr[0].length’ is the number of columns.**
 - Swapping them produces bounds errors on any non-square array.
 - 行数用 arr.length CED 4.5
 - Trace your method by hand on the example the question gives before writing the next one. Most lost points are logic that was never tested against the sample.
 - 先用题目样例手动验证 CED 2.6
 - ✗ Using ‘get()’ and ‘add()’ on an array.
 - ✓ **Arrays use ‘[]’; only an ArrayList uses the methods.**
 - The two collections have different interfaces and neither compiles as the other.
 - 数组用下标, ArrayList 用方法 CED 4.3
 - ✗ Adding to a list while looping forward over it.
 - ✓ **Build a second list, or loop backwards.**
 - Adding shifts the indices ahead of the cursor, which can loop forever.
 - 遍历时不要向前插入 CED 4.4

- ✗ Assuming an enhanced for loop can modify the elements.
 - ✓ **It gives a copy for primitives; use an indexed loop to write back.**
 - The assignment inside the loop is silently discarded.
 - 增强 for 不能修改基本类型元素 CED 2.7
- ### 2 · Selection and Iteration 选择与迭代
- ✗ Writing ‘if (x = 5)’ in a condition.
 - ✓ **‘==’ compares; ‘=’ assigns.**
 - In Java this does not compile for ints, but it is the habit that produces the wrong condition.
 - 比较用 ==, 赋值用 = CED 2.2
 - ✗ Chaining ‘else if’ where each condition should be tested.
 - ✓ **Decide whether the cases are exclusive; if not, use separate ‘if’ statements.**
 - An ‘else if’ chain stops at the first match, which is right only for exclusive cases.
 - 非互斥条件不要用 else if CED 2.3
 - ✗ Building a ‘while’ loop whose variable never changes.
 - ✓ **Update the loop variable inside the body, before the next test.**
 - The infinite loop times out and earns nothing for the logic that was otherwise correct.
 - while 循环变量要更新 CED 2.5
 - ✗ Testing a boolean with ‘if (flag == true)’.
 - ✓ **Write ‘if (flag)’. It is shorter and cannot be mistyped as an assignment.**
 - Structure that conveys intent is what the guidelines reward.
 - 布尔值直接判断 CED 2.2
- ### 3 · Class Creation 类的创建
- ✗ Overloading a method and expecting it to override.
 - ✓ **Overriding needs the SAME signature; a different parameter list overloads instead.**
 - The wrong method is then called at runtime, with no compile error.
 - 重写要求签名相同 CED 3.5
 - ✗ Writing a ‘toString’ that prints instead of returning.
 - ✓ **‘toString’ returns a String; the caller decides whether to print it.**
 - The same return-versus-print rule that catches candidates in every other method.
 - toString 要返回字符串 CED 3.7
 - Read every method header the question supplies before writing any of them. Later parts usually call earlier ones, and the signatures tell you how.
 - 先读完所有方法签名 CED 3.4