

More about Arrays

COMP2026

PROBLEM SOLVING USING OBJECT ORIENTED PROGRAMMING

2D Arrays

2D Arrays

Array with 3 rows and 6 columns

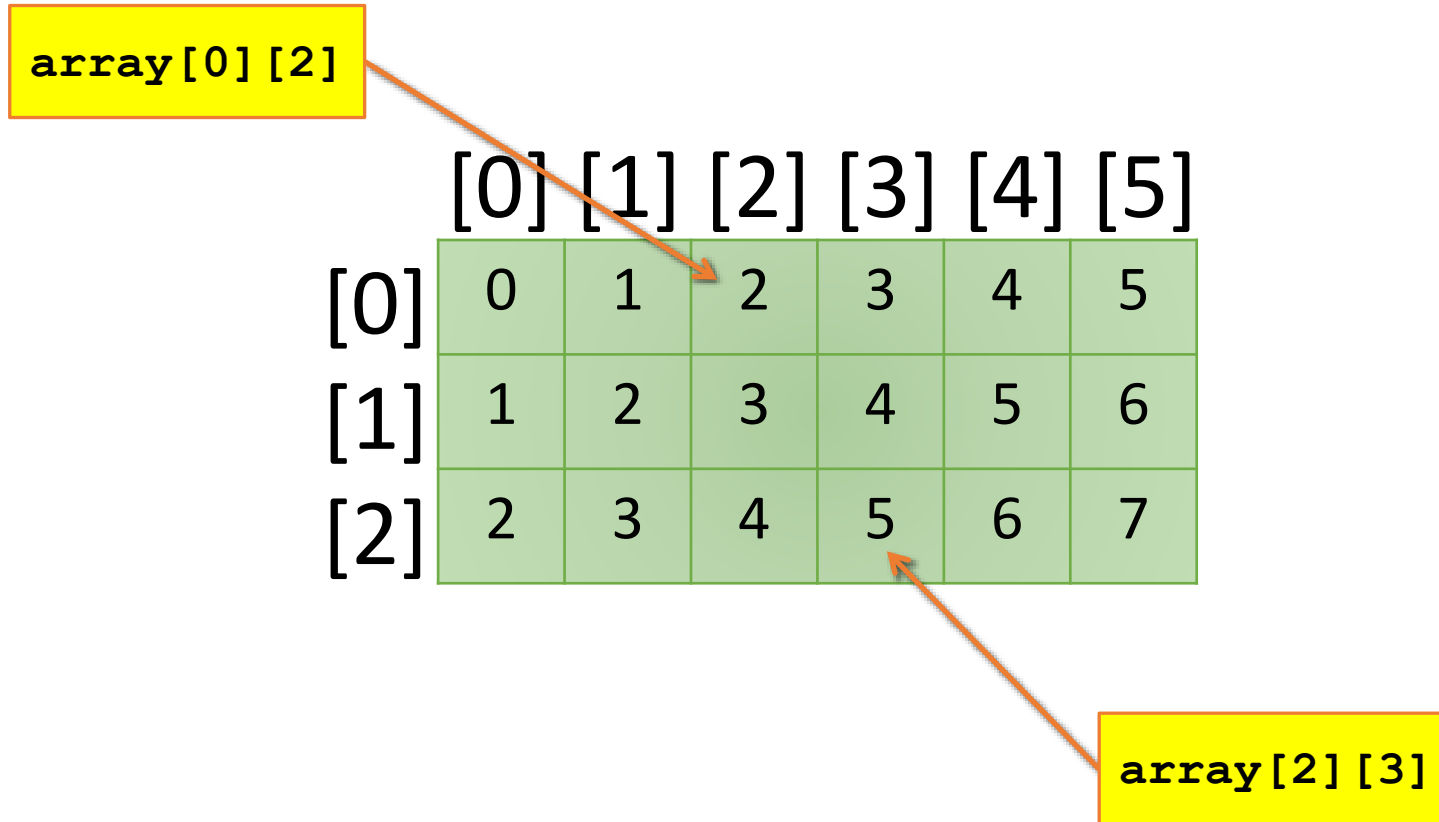
```
int [][] array = new int[3][6];  
for(int r = 0; r < array.length; r++){  
    for(int c = 0; c < array[r].length; c++){  
        array[r][c] = r + c;  
    }  
}
```

Number of rows

Number of columns

	[0]	[1]	[2]	[3]	[4]	[5]
[0]	0	1	2	3	4	5
[1]	1	2	3	4	5	6
[2]	2	3	4	5	6	7

2D Arrays



Part A

Discovery Exercises

Type your answer in **XXXXXXXXXX_lab05.docx**

Part B

Programming Exercises

Hints for Task 1

arrayA:

$i = 0$



1	6	11	12
---	---	----	----

arrayB:

$j = 0$



3	5	7	9	10
---	---	---	---	----

arrayC :

--	--	--	--	--	--	--	--	--

Hints for Task 1

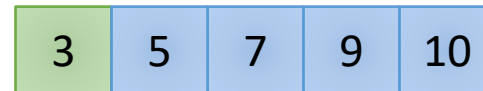
arrayA:

$i = 1$



arrayB:

$j = 0$

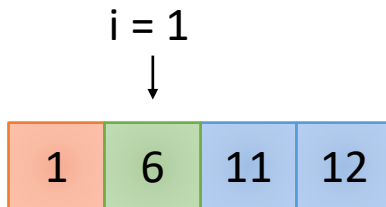


arrayC :

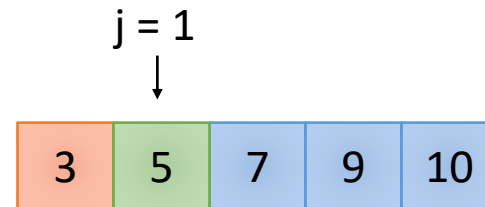


Hints for Task 1

arrayA:



arrayB:

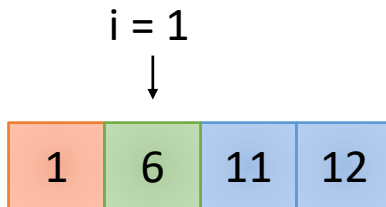


arrayC :

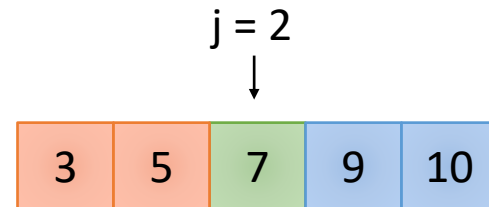


Hints for Task 1

arrayA:



arrayB:

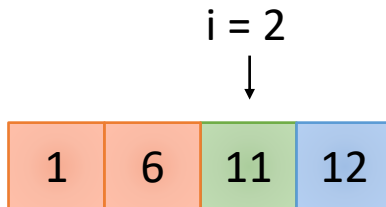


arrayC :

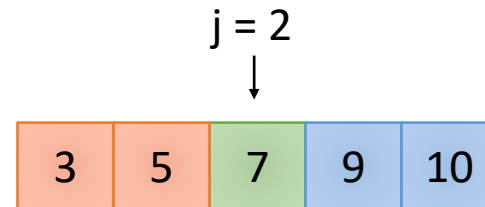


Hints for Task 1

arrayA:



arrayB:

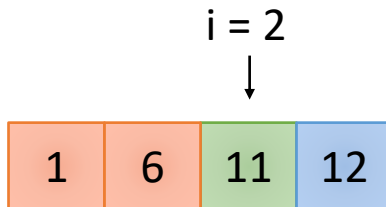


arrayC :

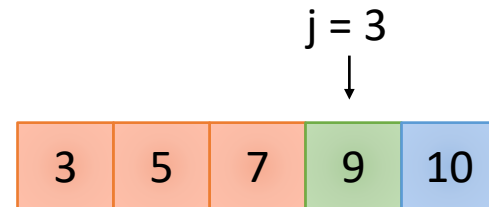


Hints for Task 1

arrayA:



arrayB:

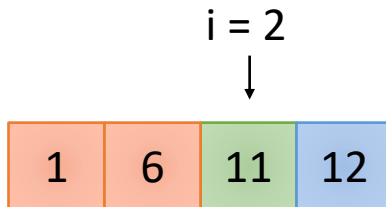


arrayC :

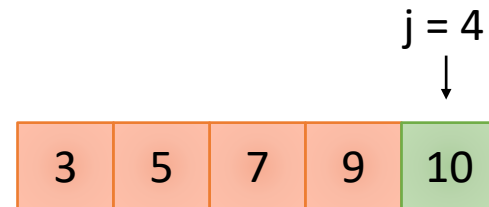


Hints for Task 1

arrayA:



arrayB:

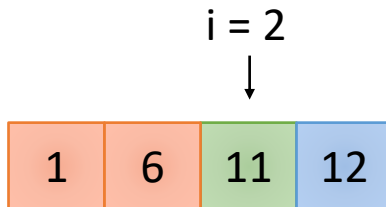


arrayC :



Hints for Task 1

arrayA:



arrayB:

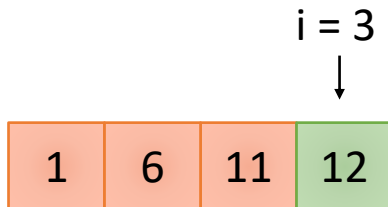


arrayC :



Hints for Task 1

arrayA:



arrayB:



arrayC :



Hints for Task 1

arrayA:

1	6	11	12
---	---	----	----

$i = 4$
↓

arrayB:

3	5	7	9	10
---	---	---	---	----

$j = 5$
↓

arrayC :

1	3	5	6	7	9	10	11	12
---	---	---	---	---	---	----	----	----

Hints for Task 2(b)

- ❖ How to read the numbers from the text file?
 - ❖ Simply use the `nextInt()` method

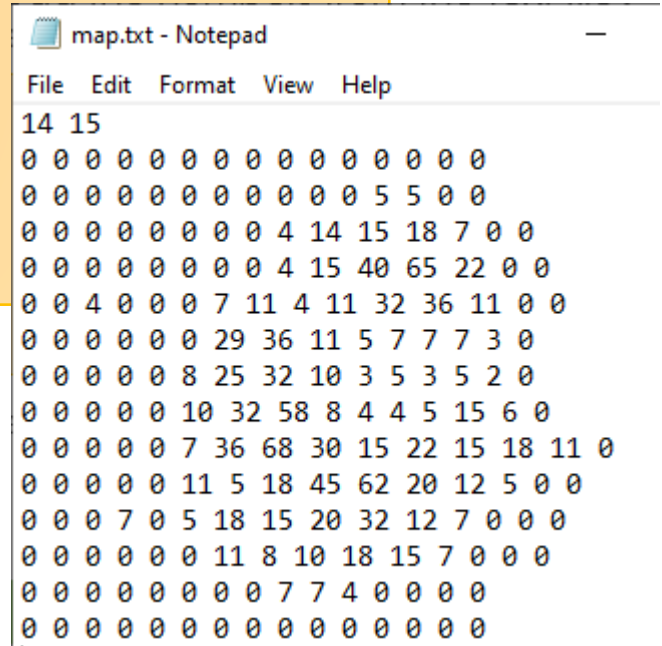
...

```
Scanner in = new Scanner(inputFile);
```

```
int row = in.nextInt();
```

```
int col = in.nextInt();
```

...



```
map.txt - Notepad
File Edit Format View Help
14 15
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 5 5 0 0
0 0 0 0 0 0 0 0 4 14 15 18 7 0 0
0 0 0 0 0 0 0 4 15 40 65 22 0 0
0 0 4 0 0 0 7 11 4 11 32 36 11 0 0
0 0 0 0 0 0 29 36 11 5 7 7 7 3 0
0 0 0 0 0 8 25 32 10 3 5 3 5 2 0
0 0 0 0 0 10 32 58 8 4 4 5 15 6 0
0 0 0 0 0 7 36 68 30 15 22 15 18 11 0
0 0 0 0 0 11 5 18 45 62 20 12 5 0 0
0 0 0 7 0 5 18 15 20 32 12 7 0 0 0
0 0 0 0 0 0 11 8 10 18 15 7 0 0 0
0 0 0 0 0 0 0 0 7 7 4 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
```

Hints for Task 2(b)

- ❖ After you know the number of rows and the number of columns, you can use loop to read the file

```
...  
  
int[][] map = new ...  
for(...) {  
    for(...) {  
        map[?][?] = in.nextInt();  
    }  
}  
...
```

Lab Exercise Submission

❖ Submit the following to Moodle

❖ XXXXXXXX_lab05.docx

❖ XXXXXXXX_lab05.zip

*Replace “XXXXXXX” with your student ID

Deadline: Before next Monday noon

References

- ❖ Dean, J., & Dean, R. (2008). *Introduction to programming with Java: A problem solving approach*. Boston: McGraw-Hill.
- ❖ Forouzan, B. A., & Gilberg, R. F. (2007). *Computer science: A structured programming approach using C* (3rd ed.). Boston, MA: Thomson Course Technology.
- ❖ Gaddis, T. (2016). *Starting out with Java* (6th ed.). Pearson.
- ❖ Liang, Y. D. (2013). *Introduction to Java programming: Comprehensive version*. (8th ed.). Pearson.
- ❖ Schildt, H. (2006). *Java a beginner's guide*. New York: McGraw Hill.
- ❖ Wu, C. T. (2010). *An introduction to object-oriented programming with Java*. Boston: McGraw Hill Higher Education
- ❖ Xavier, C. (2011). *Java programming: A practical approach*. New Delhi: Tata McGraw Hill.
- ❖ Zakhour, S., Kannan, S., & Gallardo, R. (2013). *The Java tutorial: A short course on the basics* (5th ed.).
- ❖ yet another insignificant Programming Notes. (n.d.). Retrieved from <https://www3.ntu.edu.sg/home/ehchua/programming>