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| **APCS Exposure Java** | **Exercises 10.06-10** | **Date:** |
| **Name:** | | **Period:** |

1. What is the difference between declaring a 1D array and a 2D array?

**Use this 2D array example to answer questions 2 through 5.**

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| --- | --- | --- | --- | --- | --- |
| **Q** | **W** | **E** | **R** | **T** | **Y** |
| **U** | **P** | **A** | **S** | **D** | **F** |
| **G** | **H** | **J** | **K** | **L** | **Z** |
| **X** | **C** | **V** | **B** | **N** | **M** |

2. What is located at index [1][2]?

3. What is located at index[3][5]?

4. Where is the *Q* located?

5. Where is the *V* located?

6. Write the code to declare a 2D array of integers with 10 rows and 20 columns.

7. Write the code to declare a 2D array of strings with 20 rows and 10 columns.

8. Look at the *initializer list* in program ***Java1015.java***.

Explain why a 2D array can be called an *Array of Arrays*.

9. Look at program ***Java1016.java***. Why does it crash?

10. 2D arrays normally involve matrices and matrices are usually displayed in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_configuration.

11. Look at programs ***Java1017.java*** and ***Java1018.java*** and their outputs.

How did the second program make the output line up?

12. Can a nested **for..each** loop be used to display a 2D Java static array?

13. What limitation does **for..each** have?

14. Refer to the previous question. Is this limitation for 1D arrays, 2D arrays, or both?

15. We have seen arrays of integers and arrays of strings. Can we have arrays of objects?

16. Look at programs ***Java1021.java*** and ***Java1022.java*** and their outputs.

Both programs use the **length** field to indicate the number of rows and columns.

Why does this work for the first program, but not the second.

17. Look at programs ***Java1023.java***. What is used to indicate the number of rows and columns?

18. What is a *ragged array*?

19. Would the technique from program ***Java1023.java*** work is the 2D array were *ragged*?

20. Look at programs ***Java1024.java***. What does it use to indicate the number of columns?

21. Are ragged arrays covered on the AP Exam?

22. Look at programs ***Java1025.java***. The variables **p** and **q** are passed to a **swap** method.

Explain why their values are now *swapped* in the output.

23. Look at programs ***Java1027.java***. Why does the **swap** method work in this case?