Arkansas CTE

Programming II Java: Grades 10, 11, 12

Adopted 2008

Review Programming Techniques, Ethics, and Privacy

1.1 Discuss the ethical and privacy issues of programming

1. Identify ethical and privacy practices in computer programming 1.1.1

1.2 List the steps of the programming process

1. Identify correct step when given an example 1.2.1

Data Validation

2.1 Define terminology

1. Manipulate vocabulary and concepts individually and in groups 2.1.1

2.2 Explain the importance of data validation

1. Give examples of good data validation rules for a variety of situations 2.2.1

2.3 Explain the logic of numeric range checks

1. Write programs that use range checks 2.3.1

2.4 Explain the logic of data validation to match a particular pattern

1. Write programs that require data to fit a specified pattern (i.e., Social Security Number 123-45-6789, phone number 123-456-7890, etc.) 2.4.1

String Manipulation

3.1 Define terminology

1. Manipulate vocabulary and concepts individually and in groups 3.1.1

3.2 Explain the syntax and features of various commands dealing with ASCII or Unicode numbers and their corresponding characters

1. Write program lines to determine the ASCII number of a character 3.2.1
2. Write programs to use the ASCII number to print the corresponding character 3.2.2

3.3 Explain the syntax and purpose of commands that handle all or part of a string and that concatenate strings

1. Write programs to determine the number of characters in a string 3.3.1

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2. Write programs to print a particular group of characters that are contained in a string 3.3.2
3. Write programs that concatenate multiple strings into one 3.3.3

3.4 Explain the reasons why breaking a string into its component parts is important

1. Write code that will take the first part of a string from a longer string (i.e., taking the area code from a telephone number) 3.4.1
2. Write code that will take characters from the middle of a string (i.e., removing the middle name from the full name) 3.4.2
3. Write code that will take characters from the right side of a string (i.e., ZIP code from the address) 3.4.3

Classes and Objects

4.1 Define terminology

1. Manipulate vocabulary and concepts individually and in groups 4.1.1

4.2 Explain the advantages of using classes

1. Define real-world entities in terms of state and behavior. 4.2.1

4.3 Explain the format of simple classes

1. Write a class that contains data members and methods 4.3.1
2. Write a driver class that instantiates an object 4.3.2

4.4 Explain the visibility modifiers public and private

1. Write a class that has private data members and public methods 4.4.1

4.5 Explain constructor methods

1. Write a class that contains a constructor with no arguments 4.5.1
2. Write a class that contains a constructor with one or more arguments 4.5.2
3. Write a class that overloads the constructor 4.5.3

Methods

5.1 Define terminology

1. Manipulate vocabulary and concepts individually and in groups 5.1.1

5.2 Explain the difference between formal and actual parameters

1. Give examples of formal and actual parameters 5.2.1

5.3 Explain the matching of actual parameters to formal parameters in the method call

1. Write programs that use parameters in method calls 5.3.1

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Explain the difference between passing primitive data types as parameters and passing objects as parameters

1. Write methods passing both primitive data types and String objects 5.4.1

5.5 Differentiate between void and value returning methods

1. Write methods that return values (accessor or getter methods) 5.5.1
2. Write void methods (mutator or setter methods) 5.5.2

5.6 Explain how to pass arrays, ArrayLists, and other objects as parameters

1. Write methods that have arrays, arraylists or other objects as parameters 5.6.1

One-dimensional Arrays or Vectors

6.1 Define terminology

1. Manipulate vocabulary and concepts individually and in groups 6.1.1

6.2 Explain the logical steps in initializing and loading a one-dimensional array

1. Write an appropriate program to declare, instantiate and initialize a one-dimensional array 6.2.1

6.3 Explain the use of subscripts and the syntax to use them

1. Use subscript to access particular elements in a one-dimensional array 6.3.1

6.4 Explain the logical steps in traversing a one-dimensional array to perform calculations and comparisons

1. Write loops that traverse a one-dimensional array, performing calculations and comparisons 6.4.1

6.5 Explain the logical steps in printing an entire array of data

1. Write loops that print the contents of a one-dimensional array 6.5.1

6.6 Explain the logical steps to insert a value in a one-dimensional array

1. Write code that inserts values into an existing array 6.6.1

6.7 Explain the logical steps in deleting elements in a one-dimensional array

1. Write code that deletes elements from an existing array 6.7.1

6.8 Explain the use of parallel one-dimensional arrays or vectors

1. Write programs that contain parallel one-dimensional arrays or vectors 6.8.1

ArrayLists, Searching and Sorting

7.1 Define terminology

1. Manipulate vocabulary and concepts individually and in groups 7.1.1

7.2 Discuss the difference between an ArrayList and an array

1. Determine whether an array or ArrayList would be the best data structure for a given scenario 7.2.1

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2. Discuss the differences between arrays and ArrayLists when adding and deleting 7.2.2
3. Discuss the differences between arrays and ArrayLists when accessing elements 7.2.3

7.3 Know the difference between type specific and generic ArrayLists

1. Declare and instantiate both generic and type specific ArrayLists 7.3.1

7.4 Know how to add, remove, and retrieve elements from an ArrayList

1. Write a program that adds, removes, and retrieves elements from an ArrayList 7.4.1

7.5 Explain the difference between a binary search and a sequential search

1. Write programs to demonstrate binary and sequential searches 7.5.1

7.6 Know the difference between insertion, selection, and merge sorts

1. When given code identify the type of sort used 7.6.1