AP Comp Sci

18.5 Problem Set

This is valid, as 2 is an int (and within range)

1. Assume the following declarations are made and indicate which items below are valid subscripted variables.
   1. a[0]
      1. This is valid, because a is an int array, and 0 is an int.
   2. b[0]
      1. This is valid, because 0 is a valid index in b.
   3. c[1.0]
      1. This is invalid, because c is never defined.
   4. b[‘a’]
      1. This is invalid, because ‘a’ is not a valid index.
   5. b[a]
      1. This is also invalid, because the array is not a valid index.
   6. a[x + y]
      1. This is valid, as 7+2 = 9 is a valid index in a.
   7. b[x %y]
      1. This is valid, as x % y = 1, which is a valid index for b.
   8. a[10]
      1. This is invalid, because it exceeds the limit of a.
   9. c[-1]
      1. This is invalid, because -1 is not a valid index.
   10. a[a[4]]
       1. This is valid depending on the value of a[4], which could exceed the array size. In this case it evaluates to 0, which is valid.
2. Assume that the array a defined in Question 1 contains the following values. 1 4 6 8 9 3 7 10 2 9 Indicate if the following are valid subscripts of a and, if so, state the value of the subscript. If invalid, explain why.
   1. a[2]
      1. This is valid, as 2 is an int (and within range)
      2. Output: 6
   2. a[5]
      1. This is valid, as 5 is an int (and within range)
      2. Output: 3
   3. a[a[2]]
      1. This is valid, as in this case it is equivalent to a[6]
      2. Output: 7
   4. a[4 + 7]
      1. This is invalid, as 11 exceeds the range of a[]
      2. Error
   5. a[a[5] + a[2]]
      1. This is invalid as the sum of a[5] and a[2] exceeds the range of a[]
      2. a[10] = Error
   6. a[Math.sqrt(2)]
      1. This is invalid, as irrational numbers are not valid indices.
      2. Error
3. List the errors in the following array declarations.
   1. int intArray[] = new double[10];
      1. This declares an int, called intArray, instead of an actual array.
   2. int intArray[] = new int[1.5];
      1. In addition to the previous error, this declares an array of decimal length, which is invalid.
   3. double[] doubleArray = new double[-10]
      1. This declaration is missing a semicolon, as well as using negative length, which is invalid.
   4. int intMatrix[] [] = new int[10];
      1. Similar to a, this declares an integer called intMatrix, instead of an array.
4. Write a method selectRandom that expects an array of integers as a parameter. The method should return the value of an array element at a randomly selected position.

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| --- |
| public static int selectRandom(int[] array) {  Random generator = new Random();  int arrayLength = array.length;  // Generates a random number within the range of the array  int index = generator.nextInt(arrayLength);    // Returns a random value from the array  return(array[index]);  } |