Assignment 2

RDC 10/10/2017

Name:_____ Class:_____

1. Complete the following code segment.

```
/** @return index of smaller element in array arr of integers */
public static int findMin (int[] arr)
{
      int min = arr[0];
      int minIndex = 0;
      for (int i = 1; i < arr.length; i++)
            if (arr[i] < min)     //found a smaller element
            {
                  min = arr[i];
                  minIndex = i;
            }
      return minIndex;
}
```

2. Complete the following code segment.

```
/** Add 3 to each element of array b. */
public static void changeArray (int[] b)
{
      for (int i = 0; i < b.length; i++)
      b[i] += 3;
}
```

(E) **3. Which of the following correctly initializes an array `arr` to contain four elements each with value 0?**

[a] `int[] arr = {0, 0, 0, 0};`

[b] `int[] arr = new int[4];`

[c]
```
int[] arr = new int[4];
for (int i = 0; i < arr.length; i++)
  arr[i] = 0;
```

(A) [a] only
(B) [c] only
(C) [a] and [c] only
(D) [b] and [c] only
(E) [a], [b] and [c]

4. Refer to the following code segment. You may assume that array `arr1` contains elements `arr1[0], arr1[1], …, arr1[N-1]`, where `N = arr1.length`.

```
int count = 0;
for (int i = 0; i < N; i++)
```

```
      if (arr1[i] != 0)
      {
            arr1[count] = arr1[i];
            count++;
      }
int[] arr2 = new int[count];
for (int i = 0; i < count; i++)
      arr2[i] = arr1[i];
```

If array `arr1` initially contains the elements `0, 6, 0, 4, 0, 0, 2` in this order, what will `arr2` contain after execution of the code segment? Try to solve this problem without running the codes.

_6, 4, 2_____

(D) **5. The following code fragment does a sequential search to determine whether a given integer, `value`, is sorted in an array `a[0] … a[n-1]`.**

```
      int i = 0;
      while (/* boolean expression */)
      {
            i++;
      }

      if (i == n)
            return -1;      //value not found
      else
            return i;       //value found at location i
```

Which of the following should replace `/* boolean expression */` so that the algorithm work as intended?

(A) `value != a[i]`
(B) `i < n && value == a[i]`
(C) `value != a[i] && i < n`
(D) `i < n && value != a[i]`
(E) `i < n || value != a[i]`

(C) **6. A feature of data that is used for a binary search but not necessarily for a sequential search is**

(A) length of list 都depend
(B) type of data 都不depend
(C) order of data
(D) smallest value in the list 都不depend
(E) median value of the data 都不depend

For Questions 7-9 refer to the `insertionSort` method and the private instance variable `a`, both in a `Sorter` class.

```
private Integer[] a;
```

```
/** Precondition: a[0], a[1]…a[a.length-1] is an unsorted array of
*                 Integer objects.
*   Postcondition: Array a is sorted in descending order.
*/
public void insertionSort()
{
      for (int i = 1; i < a.length; i++)
      {
            Integer temp = a[i];
            int j = i - 1;
            while (j >= 0 && temp.compareTo(a[j]) > 0)
            {
                  a[j+1] = a[j];
                  j = j - 1;
            }
            a[j+1] = temp;
      }
}
```

(B) **7. An array of Integer is to be sorted biggest to smallest using the `insertionSort` method. If the array originally contains**

1 7 9 5 4 12

what will it look like after the third pass of the for loop?

(A) 9 7 1 5 4 12
(B) 9 7 5 1 4 12
(C) 12 9 7 1 5 4
(D) 12 9 7 5 4 1
(E) 9 7 12 5 4 1

(B) **8. When sorted biggest to smallest with `insertionSort`, which list will need the fewest changes of position for individual elements?**

(A) 5, 1, 2, 3, 4, 9
(B) 9, 5, 1, 4, 3, 2
(C) 9, 4, 2, 5, 1, 3
(D) 9, 3, 5, 1, 4, 2
(E) 3, 2, 1, 9, 5, 4

(A) **9. When sorted biggest to smallest with `insertionSort`, which list will need the greatest changes of position?**

(A) 9 7 1 5 4 12
(B) 9 7 5 1 4 12
(C) 12 9 7 1 5 4
(D) 12 9 7 5 4 1
(E) 9 7 12 5 4 1

Bonus

1. Read the following blogs.

http://blog.csdn.net/u011464124/article/details/70054204

http://blog.csdn.net/xiazdong/article/details/8462393