CSC108H Worksheet: Sorting Algorithms

1. The list \([4, 2, 5, 6, 7, 3, 1]\) is shown below after each pass of a sorting algorithm:

\[
[1, 2, 5, 6, 7, 3, 4] \\
[1, 2, 5, 6, 7, 3, 4] \\
[1, 2, 3, 6, 7, 5, 4] \\
[1, 2, 3, 4, 7, 5, 6] \\
[1, 2, 3, 4, 5, 7, 6] \\
[1, 2, 3, 4, 5, 6, 7] \\
[1, 2, 3, 4, 5, 6, 7]
\]

Which sorting algorithm is being executed?

(a) bubble sort  
(b) selection sort  
(c) insertion sort

2. The list \([4, 2, 5, 6, 7, 3, 1]\) is shown below after each pass of a sorting algorithm:

\[
[2, 4, 5, 6, 3, 1, 7] \\
[2, 4, 5, 3, 1, 6, 7] \\
[2, 4, 3, 1, 5, 6, 7] \\
[2, 3, 1, 4, 5, 6, 7] \\
[2, 1, 3, 4, 5, 6, 7] \\
[1, 2, 3, 4, 5, 6, 7]
\]

Which sorting algorithm is being executed?

(a) bubble sort  
(b) selection sort  
(c) insertion sort

3. The list \([4, 2, 5, 6, 7, 3, 1]\) is shown below after each pass of a sorting algorithm:

\[
[4, 2, 5, 6, 7, 3, 1] \\
[2, 4, 5, 6, 7, 3, 1] \\
[2, 4, 5, 6, 7, 3, 1] \\
[2, 4, 5, 6, 7, 3, 1] \\
[2, 4, 5, 6, 7, 3, 1] \\
[2, 3, 4, 5, 6, 7, 1] \\
[1, 2, 3, 4, 5, 6, 7]
\]

Which sorting algorithm is being executed?

(a) bubble sort  
(b) selection sort  
(c) insertion sort
4. List \([8, 2, 8, 7, 3, 1, 2]\) is being sorted using bubble sort. Fill in the blanks to show the list after each pass.

   After the 1st pass: \([2, 8, 7, 3, 1, 2, 8]\)
   After the 2nd pass: \([2, 7, 3, 1, 2, 8, 8]\)
   After the 3rd pass: \([2, 3, 1, 2, 7, 8, 8]\)
   After the 4th pass: 
   After the 5th pass: 
   After the 6th pass: 

5. List \([1, 5, 8, 7, 6, 1, 7]\) is being sorted using selection sort. Fill in the blanks to show the list after each pass.

   After the 1st pass: \([1, 5, 8, 7, 6, 1, 7]\)
   After the 2nd pass: \([1, 1, 8, 7, 6, 5, 7]\)
   After the 3rd pass: \([1, 1, 5, 7, 6, 8, 7]\)
   After the 4th pass: 
   After the 5th pass: 
   After the 6th pass: 
   After the 7th pass: 

6. List \([6, 8, 2, 1, 1, 9, 4]\) is being sorted using insertion sort. Fill in the blanks to show the list after each pass.

   After the 1st pass: \([6, 8, 2, 1, 1, 9, 4]\)
   After the 2nd pass: \([6, 8, 2, 1, 1, 9, 4]\)
   After the 3rd pass: \([2, 6, 8, 1, 1, 9, 4]\)
   After the 4th pass: 
   After the 5th pass: 
   After the 6th pass: 
   After the 7th pass: 