Problem 1

|  |  |  |
| --- | --- | --- |
| j | Action | Array contents |
| 1 | Exchange 9 with 5 | 5, 9, 11, 3, 2, 8, 4, 6 |
| 2 | Exchange 9 with 3 | 5, 3, 11, 9, 2, 8, 4, 6 |
| 3 | Exchange 11 with 2 | 5, 3, 2, 9, 11, 8, 4, 6 |
| 4 | Exchange 9 with 4 | 5, 3, 2, 4, 11, 8, 9, 6 |

Resulting array is 5, 3, 2, 9, 11, 8, 4, 6

Number returned is 4

Problem 2

Bubble Sort

|  |  |  |
| --- | --- | --- |
| 1st iteration |  | 6, 4, 5, 3, 12, 13, 2 |
| 2nd iteration |  | 6, 5, 4, 12, 13, 3, 2 |
| 3rd iteration |  | 6, 5, 12, 13, 4, 3, 2 |
| 4th iteration |  | 12, 13, 6, 5, 4, 3, 2 |
| 5th iteration |  | 13, 12, 6, 5, 4, 3, 2 |

Selection Sort

|  |  |  |
| --- | --- | --- |
| 1st iteration |  | 11, 9, 5, 3, 2, 8, 4, 6 |
| 2nd iteration |  | 11, 9, 5, 3, 2, 8, 4, 6 |
| 3rd iteration |  | 11, 9, 8, 5, 3, 2, 4, 6 |
| 4th iteration |  | 11, 9, 8, 6, 5, 3, 2, 4 |
| 5th iteration |  | 11, 9, 8, 6, 5, 3, 2, 4 |
| 6th iteration |  | 11, 9, 8, 6, 5, 4, 3, 2 |
| 7th iteration |  | 11, 9, 8, 6, 5, 4, 3, 2 |
| 8th iteration |  | 11, 9, 8, 6, 5, 4, 3, 2 |

Insertion Sort

|  |  |  |
| --- | --- | --- |
| 1st iteration |  | 9, 5, 11, 3, 2, 8, 4, 6 |
| 2nd iteration |  | 11, 9, 5, 3, 2, 8, 4, 6 |
| 3rd iteration |  | 11, 9, 5, 3, 2, 8, 4, 6 |
| 4th iteration |  | 11, 9, 5, 3, 2, 8, 4, 6 |
| 5th iteration |  | 11, 9, 8, 5, 3, 2, 4, 6 |
| 6th iteration |  | 11, 9, 8, 5, 4, 3, 2, 6 |
| 7th iteration |  | 11, 9, 8, 6, 5, 4, 3, 2 |

Problem 3

initialize variable to point to index of 1st positive value in array(pointLastIndex)

initialize variable to save increased index of 1st positive value in array

For loop from 0 to n-1(inclusive) of array

if value @ index is negative and pointLastIndex != 0

swap the element in index with pointLastIndex

increment pointLastIndex

if value @ index is positive and pointLastIndex == 0

set both pointLastIndex to index

Problem 4

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ith | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1st |  |  |  | 4 |  |  |  |  |  |
| 2nd |  |  |  | 4 |  |  | 9 |  |  |
| 3rd |  | 2 |  | 4 |  |  | 9 |  |  |
| 4th |  | 2 | 3 | 4 |  |  | 9 |  |  |
| 5th |  | 2 | 3 | 4 | 7 |  | 9 |  |  |
| 6th |  | 2 | 3 | 4 | 7 | 8 | 9 |  |  |
| 7th | 1 | 2 | 3 | 4 | 7 | 8 | 9 |  |  |

Problem 5

Create output array using length of array

Create count array for the range of 0 to n-1(inclusive)

iterate through original array and increment index for each integer in original array

iterate through count array and if value @ index > 1, insert into output array