

I. Given the two code fragments answer the questions below (1 pt each)

A) **public void** ExampleA(ItemType[] list, **int** listLength, ItemType alpha, **boolean** result)

```

{
  int index = 0;
  while (index < listLength && alpha != list[index])
    index++;
  result = (index < listLength);
}

```

B) **public void** ExampleB(ItemType[] list, **int** listLength, ItemType alpha, **boolean** result)

```

{
  int index = listLength - 1;
  while (index >= 0 && alpha != list[index])
    index--;
  result = (index >= 0);
}

```

1) Which searches a list for the first occurrence of a given item? 1) _____

2) Which searches a list for the last occurrence of a given item? 2) _____

II. Approximately how many comparisons are performed by a binary search of 2000 items if the search item is not in the list? (2 pts) II) _____

III. Given the declaration: **int**[] list = {10, 20, 30, 40, 50, 60, 70};
 a binary search is used to search the list for a particular value. In each iteration of the search loop, the index variables first, middle, and last define the range of items being searched. When the search is finished, what is the value of **First** given the value below that is being searched for?
 Show the memory simulation. (Note: The answer should be either 0, 1, 2, 3, 4, 5, or 6.)
 (Note: Remember that Java arrays begin at index 0.) (2 pts each)

	<u>First</u>	<u>Last</u>	<u>Middle</u>	
1) Search for the value 60	0	6		1) _____

2) Search for the value 30 2) _____

3) Search for the value 55 3) _____