Selection Sort

*Given:* A list of \( n \) numbers.

*Produce:* The list sorted from lowest to highest

*How it works:* Sort a list of numbers by finding the maximum of the unsorted part of the list and moving it to the beginning of the sorted part of the list.

*Algorithm:*

Get \((n, \text{list}[1,...,n])\)
Set unsorted = \( n \)
Repeat
  \( \text{max} = \text{GetMax}([1,...,\text{unsorted}]) \)
  \( \text{temp} = \text{list}[\text{max}] \)
  \( \text{list}[\text{max}] = \text{list}[\text{unsorted}] \)
  \( \text{list}[\text{unsorted}] = \text{temp} \)
  unsorted = unsorted – 1
Until (unsorted = 0)

Binary Search

*Given:* A list of names, and a list of phone numbers, and a name to search for.

*Find:* The phone number of the person whose name we searched for.

*How it works:* Start with a sorted list of names and telephone numbers. Divide the list in half and search the half that the name is in. Keep doing this until you find the name, or you have no more to search.

Get \((n, \text{name}, \text{name}_\text{list}[1,...,n], \text{phone}_\text{list}[1,...,n])\)
start = 1
found = false
end = \( n \)
Repeat
  mid = start + \((\text{end} - \text{start})/2\)
  If (name = \text{name}_\text{list}[\text{mid}]) then
    Begin
    Print(\text{phone}_\text{list}[\text{mid}])
    found = true
    End
  Else if (name < \text{name}_\text{list}[\text{mid}]) then
    end = mid – 1
  Else
    start = mid + 1
  Until (found = true) or (end < start)
If (found = false) then
  Print("Name not found")