

Econ 524 Problem Set 2

1. Write a function to do selection sort. Selection sort is an algorithm to sort a vector of numeric values. The algorithm is as follows:

For i in $1:n$:

Find $v[j]$ where $v[j]$ is the minimum value of $v[i:n]$ (you may use the built-in R functions here)

Switch places of $v[i]$ and $v[j]$

Your function should be named `selsort` and should take one argument that is a vector of numeric values. It should return a vector of the sorted values.

2. Write a function to do bubble sort. Bubble sort is an algorithm to sort a vector of numeric values. The algorithm is as follows:

Repeat until no swaps:

For $i=1$ to $n-1$:

If $v[i]>v[i+1]$, switch places

Your function should be named `bubblesort` and should take one argument that is a vector of numeric values. It should return a vector of the sorted values.

To turn in your problem set, create a script that first defines your functions `selsort` and `bubblesort`.

Then, add the following lines to demonstrate that your `bubblesort` works:

```
v <- rnorm(5000)
```

```
selsort(v)
```

```
bubblesort(v)
```

```
v2 <- 1:5000
```

```
v2[10] <- -4
```

```
v2[4900] <- 20000
```

```
selsort(v2)
```

```
bubblesort(v2)
```

Finally, at the command prompt, try running

`bubblesort(v)`, `selsort(v)`, `sort(v)` and `bubblesort(v2)`, `selsort(v2)`, and `sort(v2)`. Include a comment at the end of your script explaining differences in speed between `sort`, `selsort`, and `bubblesort` for both `v` and for `v2`. Explain the differences.