

## Homework 6 problem 4

In [ ]:

```
import random
```

In [2]:

```
def randomized_selection(l, r, k):
    p = random.randint(l,r)
    pivot = s[p]
    s[p], s[r] = s[r], s[p]
    i = l
    for j in range(l, r):
        if s[j] < pivot:
            s[i], s[j] = s[j], s[i]
            i += 1
    s[i], s[r] = s[r], s[i]
    if i == k - 1 :
        return pivot
    if i < k :
        return randomized_selection(i+1, r, k)
    if i > k :
        return randomized_selection(l, i-1, k)
```

In [3]:

```
s = random.sample(range(0, 100), 15)
s
```

Out[3]:

```
[3, 11, 1, 42, 93, 8, 5, 22, 29, 68, 66, 33, 56, 43, 21]
```

In [4]:

```
k = 5
randomized_selection(0, len(s)-1, k)
```

Out[4]:

```
11
```

In [6]:

```
sorted(s)[k-1]
```

Out[6]:

```
11
```