CSCI 305 HW 5

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Problem 1

```
1  def findmax(A, i, j, largest):
2      if i == j
3          largest = A[i]
4      else
5          m = flooor((i+j)/2)
6          findmax(A, i, m, big1)
7          findmax(A, m+1, j, big2)
8          largest = max(big1, big2)
9  return largest
```

Relation
$\Theta(1)$
$\perp$
$T(\frac{n}{2})$
$T(\frac{n}{2})$
$\Theta(1)$
$\Theta(1)$

Recurrence relation:

$$T(1) = \Theta(1)$$
$$T(n) = 2T(\frac{n}{2}) + \Theta(1)$$

Problem 2

```
1  def linearsearch(A, n, key):
2      if n < 0
3          return -1
4      if key = A[n]
5          return n
6      return linearsearch(A, n-1, key)
```

Relation
$\Theta(1)$
$\perp$
$T(n-1)$

Recurrence relation:

$$T(1) = \Theta(1)$$
$$T(n) = T(n-1) + \Theta(1)$$

Problem 3

```
1  def fib(n):
2      if n <= 2:
3          return 1
4      return fib(n-1) + fib(n-2)
```

Relation
$\Theta(1)$
$\Theta(1)$
$T(n-1) + T(n-2)$

Recurrence relation:

$$T(1) = T(2) = \Theta(1)$$
$$T(n) = T(n-1) + \Theta(1)$$