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CIS 575: Intro to Algorithm Analysis

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1.) **Precondition:**
$A[i] \geq A[i-1]$ $\forall i \in (i..n)$
Post Condition:
$\exists x$ (A[i…n]) return x || $\exists x$ (A[i…n]) return 0

2.) a:

```
lo = 1;
hi;
n;
i = (lo + hi)/2
// starts in the middle of the array
```

3.) c:

```
while(lo ≤ hi)
```

4.) b:

```
while(lo ≤ hi)
{
        if(A[i] < x)
                lo = i + 1;
        else if(A[i] > x)
                hi = i -1;
        else
                return i;

}

return 0;
```

5.)

```
Recursive(x, A, lo, hi)
{
        i = (lo + hi)/2;

        if(lo > hi)
                return 0;
        else if(A[i] < x)
                Recursive(x, A, i+1, hi);
        else if(A[i] > x)
                Recursive(x, A, lo, i-1);
        else
                return i;

}
```