ALGORITHM EFFICIENCY

1. Give the BigO notation for each of the following pseudocode fragments:

(A)
```
a = n
b = n + 1
```

(B)
```
a = n
if( a >= 0 )
    b = n + 1
else
    b = (-1)*n + 1
end if
```

(C)
```
i = 1
loop( i <= n )
    print( i )
    i = i + 1
end loop
```

(D)
```
i = n
loop( i > 0 )
    print( i )
    i = i - 1
end loop
j = 1
loop( j <= n )
    print( j )
    j = j + 2
end loop
```

(E)
```
i = 1
loop( i <= n )
    j = 1
    loop( j <= n )
        k = 1
        loop( k <= n )
            print( i, j, k )
            k = k + 1
        end loop
        j = j + 1
    end loop
    i = i + 1
end loop
```

(F)
```
i = 1
loop( i <= n )
    j = 1
    loop( j <= n )
        k = 1
        loop( k <= 3 )
            print( i, j, k )
            k = k + 1
        end loop
        j = j + 1
    end loop
    i = i + 1
end loop
```

(G)
```
i = 1
loop( i <= n )
    print( i )
    i = i * 2
end loop
```

(H)
```
i = n
loop( i > 0 )
    print( i )
    i = i / 2
end loop
j = 1
loop( j <= n )
    print( j )
    j = j + 2
end loop
```

(I)
```
i = 1
loop( i <= n )
    process(...)
    i = i * 2
end loop
```

Note: **process** is a linear algorithm.

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2. **(A).** If **ary** is containing the following numbers and the variable **n** represents the size of the array, 8 in this case, what would the value returned from the algorithm be? _____

7	4	10	5	10	6	9	8
0	1	2	3	4	5	6	7

(B). Big O notation: _____

```
Algorithm guess(ary, n )
Pre:    ary – has data
        n – its actual size
Post:

   k = 0
   i = 1
   loop( i < n )
      if( ary[i] > ary[0] )
         k = k + 1
      end if
      i = i + 1
   end loop
   return k
end guess
```