

## HW 4.

Sol. 7 The efficiency classes will be the same for both algorithms BUT inner most loops

$\begin{aligned} & \text{while } j \geq 0 \wedge A[j] > v \\ & A[j+1] \leftrightarrow A[j] \\ & j \leftarrow j-1 \end{aligned}$	$\begin{aligned} & \text{while } j \geq 0 \wedge A[j] > A[j+1] \\ & \text{swap}(A[j], A[j+1]) \\ & j \leftarrow j-1 \end{aligned}$
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differ in swap operation. Writing out swap operation into 3 equivalent assignments WILL make a difference in algo's execution time? This difference will be ~~more~~ constant of 3+.

S. 2.8 a.

Let  $F$  be a DFS forest for  $G$ .  $F$  will be 2 colored if there is no back edge connecting two vertices both on odd layers or both on even layers of the forest. a simple DFS traversal has to ~~fail~~ exist if this property is failed.

S. 4.7

Algo BitStr Rec ( $n$ )

if  $n=0$   
write  $B$

else

$B[n-1] \neq 0$ ; BitStr Rec ( $n-1$ )

$B[n-1] = 0$ ; BitStr Rec ( $n-1$ )

### 5.5-1

Algo Log FL ( $n$ )

if  $n=1$  return  $\emptyset$

else return Log FL ( $\lfloor \frac{n}{2} \rfloor$ ) + 1

Time:  $A(n) = A(\lfloor \frac{n}{2} \rfloor) + 1$  for  $n > 1$   $A(1) = \emptyset$

$A(n) = \lfloor \log_2 n \rfloor \in \Theta(\log n)$

### 5.6.11

Algo Pancake ( $S, n$ )

if  $(n=1)$  return  $\emptyset$

// stack of pancakes  $S$ , size  $n$

$i \leftarrow$  Get Index Of Largest Pancake ( $S, n$ )

Insert Flipper under Index ( $S, i$ )

Flip stack ( $S, 0-i$ )

Flip stack ( $S, 0-n$ )

Pancake ( $S, n-1$ )