

## Priority Queue Worksheet

1. Suppose that the sequence of operations

P R I O \* R \* I \* T \* Y \* \* \* Q U E \* \* \* U \* E

(where a letter means "insert" that letter and an asterisk means "remove the maximum") is applied to an initially empty priority queue. Give the sequence of values returned by the remove the maximum operations.

max

تست اول \*  
ب حذف بزرگتر  
max

$P, R, I, O \rightarrow \{I, O, P, R\} \xrightarrow{*} \{I, O, P\} \xrightarrow{R} \{I, O, P, R\} \xrightarrow{*} \{I, O, P\} \xrightarrow{*} \{I, O\} \xrightarrow{I} \{I, I, O\}$   
 $\xrightarrow{*} \{I, I\} \xrightarrow{T} \{I, I, T\} \xrightarrow{*} \{I, I\} \xrightarrow{Y} \{I, I, Y\} \xrightarrow{*} \{I, I\} \xrightarrow{*} \{I\} \xrightarrow{*} \{\}$   
 $Q, U, E \rightarrow \{E, Q, U\} \xrightarrow{*} \{E, Q\} \xrightarrow{*} \{E\} \xrightarrow{*} \{\} \xrightarrow{U} \{U\} \xrightarrow{*} \{\} \xrightarrow{E} \{E\}$

جواب: R, R, P, O, T, Y, I, I, U, Q, E, U

2. Repeat for the scenario where the asterisk means "remove the minimum".

min

تست دوم \*  
ب حذف کوچکتر  
min

$P, R, I, O \rightarrow \{I, O, P, R\} \xrightarrow{*} \{O, P, R\} \xrightarrow{R} \{O, P, R, R\}$   
 $\xrightarrow{*} \{P, R, R\} \xrightarrow{*} \{R, R\} \xrightarrow{I} \{I, R, R\} \xrightarrow{*} \{R, R\} \xrightarrow{T} \{R, R, T\}$   
 $\xrightarrow{*} \{R, T\} \xrightarrow{Y} \{R, T, Y\} \xrightarrow{*} \{T, Y\} \xrightarrow{*} \{Y\} \xrightarrow{*} \{\} \xrightarrow{Q, U, E} \{E, Q, U\}$   
 $\xrightarrow{*} \{Q, U\} \xrightarrow{*} \{U\} \xrightarrow{*} \{\} \xrightarrow{U} \{U\} \xrightarrow{*} \{\} \xrightarrow{E} \{E\}$

جواب: I, O, P, I, R, R, T, Y, E, Q, U, U