

```
STACK-EMPTY( $S$ )  
if  $top[S] = 0$   
    return TRUE  
else  
    return FALSE
```

```
PUSH ( $S, x$ )  
 $top[S] \leftarrow top[S] + 1$   
 $S[top[S]] \leftarrow x$ 
```

```
POP( $S$ )  
if STACK-EMPTY( $S$ )  
    error: "underflow"  
else  
     $top[S] \leftarrow top[S] - 1$   
    return  $S[top[S] + 1]$ 
```

ENQUEUE(Q, x)
if $tail[Q] = head[Q]$ and $lastop = E$
 overflow
else
 $Q[tail[Q]] \leftarrow x$
 $tail[Q] \leftarrow tail[Q] + 1$
 if $tail[Q] = length[Q]$
 $tail[Q] \leftarrow 0$
 $lastop \leftarrow E$

DEQUEUE(Q)
if $tail[Q] = head[Q]$ and $lastop = D$
 underflow
else
 $x \leftarrow Q[head[Q]]$
 $head[Q] \leftarrow head[Q] + 1$
 if $head[Q] = length[Q]$
 $head[Q] \leftarrow 0$
 $lastop \leftarrow D$
 return x