

COMPUTER SCIENCE 105
SUMMER SCHOOL 2006



Tutorial 3

Stacks, Queues and Big O

Question 1

Show a Stack and a Queue after each of the following sets of operations

Push (0)	Push (1)	Push (1)
Push (1)	Push (0)	Pop ()
Push (2)	Push (4)	Push (6)
Push (3)	Pop ()	Pop ()
Pop ()	Pop ()	Push (0)
Pop ()	Push (6)	Push (4)
Pop ()	Pop ()	Push (5)
Pop ()	Pop ()	Pop ()

Question 2

How stacks and queues work is pretty simple, but less clear is how they can be used.

Class Discussion

Example

Graphs and stacks and queues

Question 3

Give the Big O of the runtime of the following code snippets (making sure you identify the invariants)

```
for (int i = 0; i < n; i++)  
    // do stuff
```

```
for (int i = 0; i < n; i++)  
    for (int j = 0; j < n; j++)  
        // do stuff
```

```
for (int i = 0; i < n; i++)  
    for (int j = 0; j < i; j++)  
        // do stuff
```

```
for (int i = 0; i < n; i++)  
    // do stuff  
for (int j = 0; j < n; j++)  
    // do stuff
```

```
for (int i = 0; i < n; i *= i)  
    // do stuff
```

```
for (int i = 0; i < n; i++)  
    for (int j = 0; j < m; j++)  
        // do stuff
```

```
for (int i = 0; i < n; i++)  
    // do stuff  
for (int j = 0; j < m; j++)  
    // do stuff
```