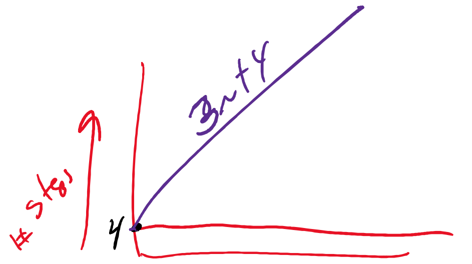
CSE12 - Lecture 9

Wednesday, April 17, 2024   10:00 AM

Exam 1 - Wednesday

- https://ucsd-cse12-sp24.github.io/lectures/exam1.html



Lecture 9

Counting Steps

N → # of elements in the structure

ArrayList Insert - ignore ExpandCapacity

```
public void insert(int index, String s) {
  //expandCapacity();    //ignore
  for (int i = size - 1; i >= index ; i--) {
    this.elements[i+1] = this.elements[i];
  }
  this.elements[index] = s;
  this.size += 1;
}
```

Best Case	Worst Case	Avg Case
4	3N + 4	$\frac{3}{2}N + 4$

ArrayList ExpandCapacity

```
private void expandCapacity() {
  int currentCapacity = this.elements.length;
  if(this.size < currentCapacity) { return; }
  String[] expanded = new String[currentCapacity * 2];
  for(int i = 0; i < this.size; i += 1) {
    expanded[i] = this.elements[i];
  }
  this.elements = expanded;
}
```

Best Case	Worst Case	Avg Case
3	7N + 6	

ArrayList Insert - with ExpandCapacity

```
public void insert(int index, String s) {
  expandCapacity();
  for (int i = size - 1; i >= index ; i--) {
    this.elements[i+1] = this.elements[i];
  }
  this.elements[index] = s;
  this.size += 1;
}
```

Best Case	Worst Case	Avg Case
7	10N + 10	

add()

3 + 2 = 5   7N + 6 + 2 = 7N + 8

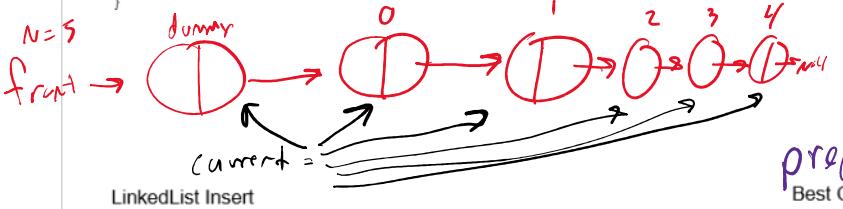
Name: ______________ PID: ______________ Code: 6891

Counting Steps - where size of the contents is *n*

LinkedList Add

Best Case	Worst Case	Avg Case
1	1	
N+1	N	
1	1	
	2N+4	

```
public void add(String s) {
  Node current = this.front;
  while(current.next != null) {
    current = current.next;
  }
  current.next = new Node(s, null);
  this.size += 1;
}
```



LinkedList Insert

prepend()

Best Case	Worst Case	Avg Case
1	1	
1+1+0	1+(N+1)+N	
0	N	
1	1	
1	1	
5	3N+5	

```
public void insert(int index, String s) {
  Node current = this.front;
  for(int i = 0; i < index; i += 1) {
    current = current.next;
  }
  current.next = new Node(s, current.next);
  this.size += 1;
}
```

LinkedList Get

Best Case	Worst Case	Avg Case
1	1	
1+1+0	1+(N+1)+N	
0	N	
1	1	
4	3N+4	

```
public String get(int index) {
  Node current = this.front.next;
  for(int i = 0; i < index; i += 1) {
    current = current.next;
  }
  return current.value;
}
```

ArrayList Get

Best Case	Worst Case	Avg Case
1	1	1

```
public String get(int index) {
  return this.elements[index];
}
```