

# SC101

## Lecture 9



Heath Ledger gives one of the best performances of the last twenty years. When you watch his take on the Joker, it's one of complete surprise and mystery. It's frightening with how chaotic and mischievous he makes him.

November 21, 2019 | Rating: 5/5 | [Full Review...](#)

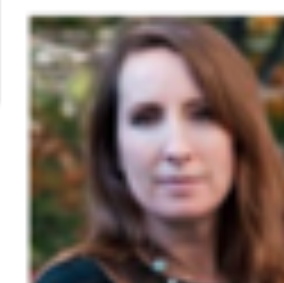


**Paul McGuire Grimes**  
[KSTP-TV \(St. Paul, MN\)](#)



It seems almost cruel to take beloved child archetypes and turn them into projections for adult angst.

January 28, 2020 | [Full Review...](#)



**Felicia Feaster**  
Charleston City Paper

**(+1): This movie is so good!**

**(-1): This film is so bad...**

**(-1): This movie suffers from some cliché**

**(+1): This film deserves an Oscar!**

**(+1): Like it a lot**

**(-1): A lot of bad acting**

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{  
  'this': 1, 'movie': 1, 'is': 1, 'so': 1, 'good': 1  
}
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{  
  'this': 1, 'movie': 1, 'is': 1, 'so': 1, 'good': 1  
}
```

```
{  
  'this': 0, 'movie': 1, 'is': 0, 'so': 0, 'good': 1, 'film': -1, 'bad': -1  
}
```

**‘this’: 0, ‘movie’: 0, ‘is’: 0, ‘so’: 0, ‘good’: 1, ‘film’: 0, ‘bad’: -2, ‘suffers’: -1, ‘from’: -1  
‘some’: -1, ‘cliche’: -1, ‘deserves’: 1, ‘an’: 1, ‘oscar’: 1, ‘like’: 1, ‘it’: 1, ‘a’: 0, ‘lot’: 0  
‘of’: -1, ‘acting’: -1**

```
{  
'positive': ['good', 'deserves', 'an', 'oscar', 'like', 'it'],  
'neutral': ['this', 'movie', 'is', 'so', 'film', 'a', 'lot'],  
'negative': ['bad', 'suffers', 'from', 'some', 'cliche', 'of', 'acting']  
}
```

# Binary Search



# Find 37

3	6	9	13	17	24	37	55	82	99
---	---	---	----	----	----	----	----	----	----

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$O(\log N)$


<b>3</b>	<b>6</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>23</b>	<b>33</b>	<b>45</b>	<b>66</b>	<b>99</b>
----------	----------	----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------

3	6	9	10	11	23	33	45	66	99
---	---	---	----	----	----	----	----	----	----



**low=0**

3	6	9	10	11	23	33	45	66	99
---	---	---	----	----	----	----	----	----	----

  
**low=0**

  
**high=9**



3	6	9	10	11	23	33	45	66	99
---	---	---	----	----	----	----	----	----	----



**low=0**



**mid=4**



**high=9**

7

3	6	9	10	11	23	33	45	66	99
---	---	---	----	----	----	----	----	----	----

↑  
low=0

↑  
mid=4

↑  
high=9

7

3	6	9	10	11	23	33	45	66	99
---	---	---	----	----	----	----	----	----	----

↑  
low=0

↑  
high=4

7

3	6	9	10	11	23	33	45	66	99
---	---	---	----	----	----	----	----	----	----

↑  
low=0

↑  
mid=2

↑  
high=4

7

3	6	9	10	11	23	33	45	66	99
---	---	---	----	----	----	----	----	----	----

↑  
low=0

↑  
high=2

7

3	6	9	10	11	23	33	45	66	99
---	---	---	----	----	----	----	----	----	----



low=0



mid=1



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# Bubble Sort

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def bubble_sort(lst):

    n = len(lst)

    for i in range(n):

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        for j in range(0, n-i-1):

            if lst[j] > lst[j+1]:

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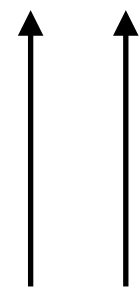
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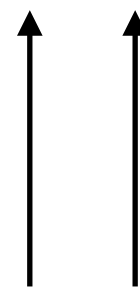
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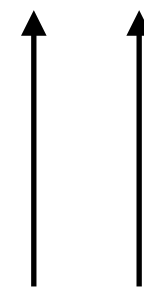
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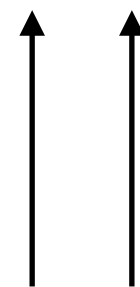
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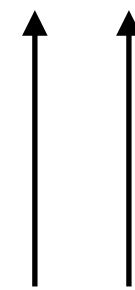
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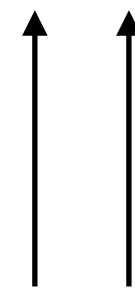
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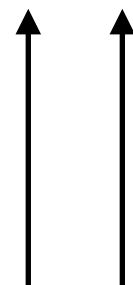
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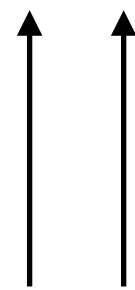
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                lst[j+1], lst[j] = lst[j], lst[j+1]
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lst = [1, 2, 4, 3, 7]



n = 5

i = 1

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```
#3. TODO Explain why it is called "Bubble sort"
def bubble_sort(lst):

    n = len(lst)

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**lst = [1, 2, 4, 3, 7]**

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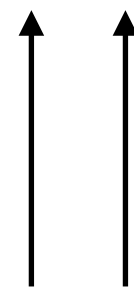
    for i in range(n):

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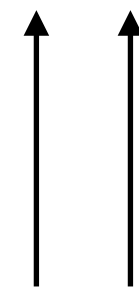
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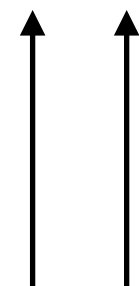
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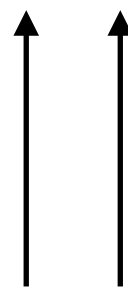
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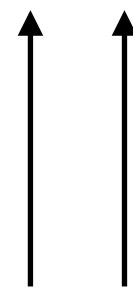
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**$O(N^2)$**