

# Sorting Data



Motivation



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by Christine Alvarado, Mia Minnes, and Leo Porter, 2015.

# By the end of this video you will be able to...

- Define sorting
- Explain why sorting data can be useful

# Binary Search:

Cut the list in half, only search half the list

Montreal Canada YMX	Lagos Nigeria LOS	Essen Germany ESS	Chicago USA ORD	Beijing China PEK	Sydney Australia SYD	Quito Ecuador UIO	Agra India AGR
0	1	2	3	4	5	6	7

# Binary Search:

Cut the list in half, only search half the list

Agra India AGR	Beijing China PEK	Chicago USA ORD	Essen Germany ESS	Lagos Nigeria LOS	Montreal Canada YMX	Quito Ecuador UIO	Sydney Australia SYD
0	1	2	3	4	5	6	7

List must be sorted on what you are searching (city)

# Sorting

Agra India AGR	Beijing China PEK	Chicago USA ORD	Essen Germany ESS	Lagos Nigeria LOS	Montreal Canada YMX	Quito Ecuador UIO	Sydney Australia SYD
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0

1

2

3


4

5

6

7

# Sorting



Agra India AGR	Beijing China PEK	Chicago USA ORD	Essen Germany ESS	Lagos Nigeria LOS	Montreal Canada YMX	Quito Ecuador UIO	Sydney Australia SYD
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0

1

2

3

4

5

6

7

# Sorting

Sydney Australia SYD	Montreal Canada YMX	Beijing China PEK	Quito Ecuador UIO	Essen Germany ESS	Agra India AGR	Lagos Nigeria LOS	Chicago USA ORD
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0

1

2

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6

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# Sorting

Sydney Australia SYD	Montreal Canada YMX	Beijing China PEK	Quito Ecuador UIO	Essen Germany ESS	Agra India AGR	Lagos Nigeria LOS	Chicago USA ORD
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0

1

2

3

4

5

6

7



## Linear Search:

Step through from beginning of the array to end

Montreal Canada YMX	Lagos Nigeria LOS	Essen Germany ESS	Chicago USA ORD	Beijing China PEK	Sydney Australia SYD	Quito Ecuador UIO	Agra India AGR
0	1	2	3	4	5	6	7

# Linear Search:

Step through from beginning of the array to end

Agra India AGR	Beijing China PEK	Chicago USA ORD	Essen Germany ESS	Lagos Nigeria LOS	Montreal Canada YMX	Quito Ecuador UIO	Sydney Australia SYD
0	1	2	3	4	5	6	7

Performance payoff if list is sorted

## Duplicates?

7	16	66	43	97	51	84	80	73	30	85	50	41	84	47
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## Duplicates?

7	16	66	43	97	51	84	80	73	30	85	50	41	84	47
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Sort



7	16	30	41	43	47	50	51	66	73	80	84	84	85	97
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# Thought questions

- How lucky can we be?
- How unlucky can we be?
- Can upfront work help us later?