Counting Website Visits

Developing an Algorithm

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Counting Visits per Visitor

- Step 1: Work an Example
  - Basic problem: Count occurrences of a String

Counting Visits per Visitor

Cat

Snake

T-Rex

Snake

Cat

- Step 1: Work an Example
  - Basic problem: Count occurrences of a String

Counting Visits per Visitor

Cat

Snake

T-Rex

Snake

Cat

Name	Count
Cat	2
Snake	2
T-Rex	1

- Step 1: Work an Example
  - Basic problem: Count occurrences of a String

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

- Step 2: Write down what you did

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Name	Count

- Step 2: Write down what you did

1. **Made an empty table**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Name	Count

- Step 2: Write down what you did

HashMap from Strings to Integers

1. **Made an empty table**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value

- Step 2: Write down what you did

HashMap from Strings to Integers

1. **Made an empty table**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value

counts

- Step 2: Write down what you did

HashMap from Strings to Integers

1. **Made an empty table**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value

counts

- Step 2: Write down what you did

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value

counts

- Step 2: Write down what you did
  - 2 **Looked at first String (Cat)**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value

counts

- Step 2: Write down what you did
  2. **Looked at first String (Cat)**
  3. **Looked for “Cat” in counts (not there)**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value
Cat	1

counts

- Step 2: Write down what you did
  2. **Looked at first String (Cat)**
  3. **Looked for “Cat” in counts (not there)**
  4. **Put “Cat” into counts with value 1**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value
Cat	1

`counts`

- Step 2: Write down what you did

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value
Cat	1
Snake	1

`counts`

- Step 2: Write down what you did
  5. **Looked at second String (Snake)**
  6. **Looked for “Snake” in counts (not there)**
  7. **Put “Snake” into counts with value 1**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value
Cat	1
Snake	1

`counts`

- Step 2: Write down what you did

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value
Cat	1
Snake	1
T-Rex	1

`counts`

- Step 2: Write down what you did
  8. **Looked at third String (T-Rex)**
  9. **Looked for "T-Rex" in counts (not there)**
  10. **Put "T-Rex into counts with value 1**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value
Cat	1
Snake	1
T-Rex	1

`counts`

- Step 2: Write down what you did

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value
Cat	1
Snake	1
T-Rex	1

`counts`

- Step 2: Write down what you did
  - 11 **Looked at fourth String (Snake)**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value
Cat	1
Snake	1
T-Rex	1

`counts`

- Step 2: Write down what you did
  1. **Looked at fourth String (Snake)**
  2. **Looked for “Snake” in counts (found 1)**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value
Cat	1
Snake	2
T-Rex	1

`counts`

- Step 2: Write down what you did
  11. **Looked at fourth String (Snake)**
  12. **Looked for “Snake” in counts (found 1)**
  13. **Put “Snake” into counts with value 2**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value
Cat	1
Snake	2
T-Rex	1

`counts`

- Step 2: Write down what you did

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value
Cat	2
Snake	2
T-Rex	1

`counts`

- Step 2: Write down what you did
  - 14 **Looked at fifth String (Cat)**
  - 15 **Looked for “Cat” in counts (found 1)**
  - 16 **Put “Cat” into counts with value 2**

Step 2: Write Down What You Did

Cat

Snake

T-Rex

Snake

Cat

Key	Value
Cat	2
Snake	2
T-Rex	1

`counts`

- Step 2: Write down what you did
  - 17 **Counts is the answer**

Step 2: Write Down What You Did

1. Made an empty HashMap from Strings to Integers
2. Looked at first String (Cat)
3. Looked for “Cat” in counts (not there)
4. Put “Cat” into counts with value 1
5. Looked at second String (Snake)
6. Looked for “Snake” in counts (not there)
7. Put “Snake” into counts with value 1
8. Looked at third String (T-Rex)
9. Looked for “T-Rex” in counts (not there)
10. Put “T-Rex” into counts with value 1
11. Looked at fourth String (Snake)
12. Looked for “Snake” in counts (found 1)
13. Put “Snake” into counts with value 2
14. Looked at fifth String (Cat)
15. Looked for “Cat” in counts (found 1)
16. Put “Cat” into” counts with value 2
17. counts is the answer

Step 3: Find Patterns/Generalize

1. Made an empty HashMap from Strings to Integers
2. Looked at first String (Cat)
3. Looked for “Cat” in counts (not there)
4. Put “Cat” into counts with value 1
5. Looked at second String (Snake)
6. Looked for “Snake” in counts (not there)
7. Put “Snake” into counts with value 1
8. Looked at third String (T-Rex)
9. Looked for “T-Rex” in counts (not there)
10. Put “T-Rex” into counts with value 1
11. Looked at fourth String (Snake)
12. Looked for “Snake” in counts (found 1)
13. Put “Snake” into counts with value 2
14. Looked at fifth String (Cat)
15. Looked for “Cat” in counts (found 1)
16. Put “Cat” into” counts with value 2
17. counts is the answer

Step 3: Find Patterns/Generalize

1. Made an empty HashMap from Strings to Integers
2. Looked at first String (Cat)
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9. Looked for “T-Rex” in counts (not there)
10. Put “T-Rex” into counts with value 1
11. Looked at fourth String (Snake)
12. Looked for “Snake” in counts (found 1)
13. Put “Snake” into counts with value 2
14. Looked at fifth String (Cat)
15. Looked for “Cat” in counts (found 1)
16. Put “Cat” into” counts with value 2
17. counts is the answer

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1. Made an empty HashMap from Strings to Integers
2. Looked at first String (Cat)
3. Looked for “Cat” in counts (not there)
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7. Put “Snake” into counts with value 1
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9. Looked for “T-Rex” in counts (not there)
10. Put “T-Rex” into counts with value 1
11. Looked at fourth String (Snake)
12. Looked for “Snake” in counts (found 1)
13. Put “Snake” into counts with value 2
14. Looked at fifth String (Cat)
15. Looked for “Cat” in counts (found 1)
16. Put “Cat” into” counts with value 2
17. counts is the answer

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1. Made an empty HashMap from Strings to Integers
2. Looked at first String (Cat)
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7. Put “Snake” into counts with value 1
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9. Looked for “T-Rex” in counts (not there)
10. Put “T-Rex” into counts with value 1
11. Looked at fourth String (Snake)
12. Looked for “Snake” in counts (found 1)
13. Put “Snake” into counts with value 2
14. Looked at fifth String (Cat)
15. Looked for “Cat” in counts (found 1)
16. Put “Cat” into” counts with value 2
17. counts is the answer

Step 3: Find Patterns/Generalize

1. Made an empty HashMap from Strings to Integers
2. Looked at first String (Cat)
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8. Looked at third String (T-Rex)
9. Looked for “T-Rex” in counts (not there)
10. Put “T-Rex” into counts with value 1
11. Looked at fourth String (Snake)
12. Looked for “Snake” in counts (found 1)
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17. counts is the answer

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1. Made an empty HashMap from Strings to Integers
2. Looked at first String (Cat)
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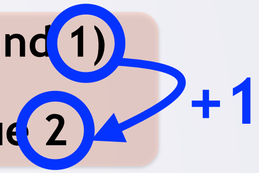
7. Put “Snake” into counts with value 1
8. Looked at third String (T-Rex)
9. Looked for “T-Rex” in counts (not there)
10. Put “T-Rex” into counts with value 1
11. Looked at fourth String (Snake)
12. Looked for “Snake” in counts (found 1)
13. Put “Snake” into counts with value 2



14. Looked at fifth String (Cat)
15. Looked for “Cat” in counts (found 1)
16. Put “Cat” into” counts with value 2

17. counts is the answer

Step 3: Find Patterns/Generalize

1. Make an empty HashMaps<String,Integer> (counts)
2. For each name in strings
    a. Check if name is in counts
        i. If not: put name in with a value of 1
        ii. If so: update the value to be 1 more
3. counts is the answer

Step 4: Test Algorithm

1. Make an empty HashMaps<String,Integer> (counts)
2. For each name in strings
    a. Check if name is in counts
        i. If not: put name in with a value of 1
        ii. If so: update the value to be 1 more
3. counts is the answer

Step 4: Test Algorithm

Name	Count
Fish	3
Dog	1

Now it's your turn.
Test on Fish Dog Fish Fish

1. Make an empty HashMaps<String,Integer> (counts)
2. For each name in strings
    a. Check if name is in counts
        i. If not: put name in with a value of 1
        ii. If so: update the value to be 1 more
3. counts is the answer

Step 4: Test Algorithm

Name	Count
Fish	3
Dog	1

Algorithm appears to be good!

1. Make an empty HashMaps<String,Integer> (counts)
2. For each name in strings
    a. Check if name is in counts
        i. If not: put name in with a value of 1
        ii. If so: update the value to be 1 more
3. counts is the answer

Slight Changes for LogEntrys

1. Make an empty HashMaps<String,Integer> (counts)
2. For each le in records
    a. ip is le's ipAddress
    b. check if ip is in counts
        i. If not: put ip in with a value of 1
        ii. If so: update the value to be 1 more
3. counts is the answer

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1. Make an empty HashMaps<String,Integer> (counts)
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    b. check if ip is in counts
        i. If not: put ip in with a value of 1
        ii. If so: update the value to be 1 more
3. counts is the answer