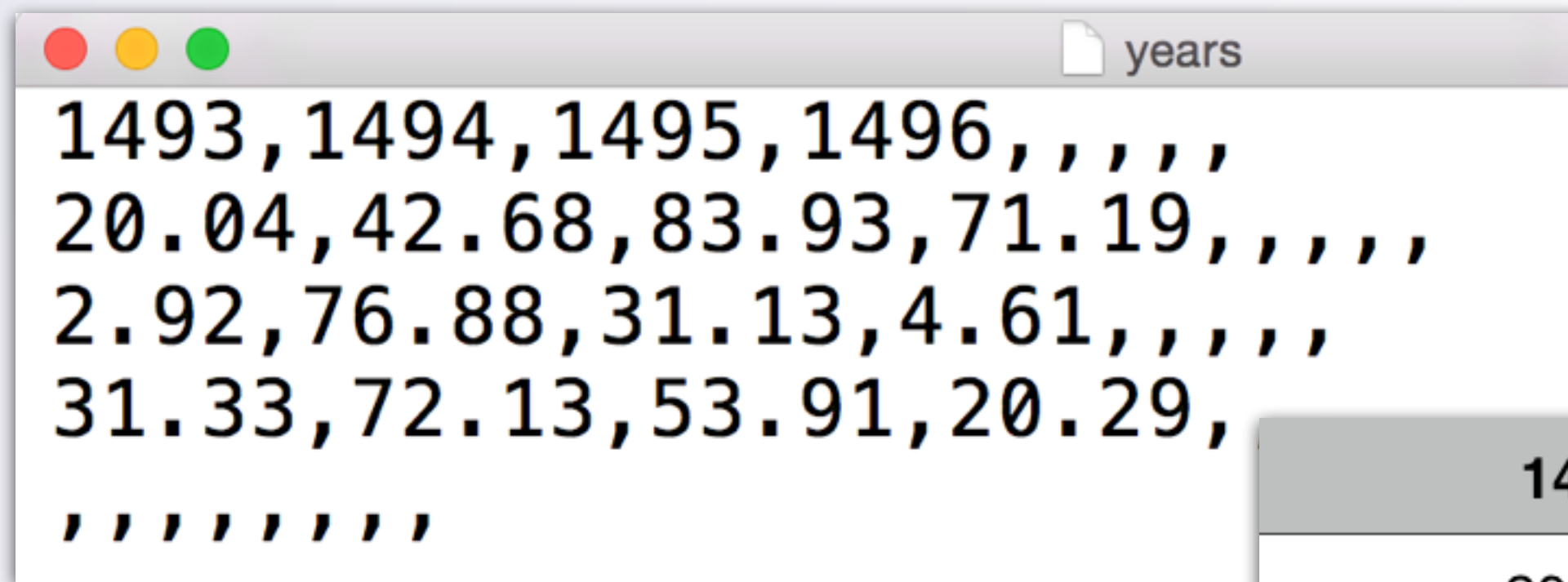# Converting Strings to Numbers

Everything Is a Number, But…

Numeric Data in CSV Files

years
```
1493,1494,1495,1496,,,,,
20.04,42.68,83.93,71.19,,,,,
2.92,76.88,31.13,4.61,,,,,
31.33,72.13,53.91,20.29,
,,,,,,,,
```

1493	1494	1495	1496
20.04	42.68	83.93	71.19
2.92	76.88	31.13	4.61
31.33	72.13	53.91	20.29

- Numerical data in CSV file

- Read in as a **String**

  - Sequence of characters '1' '4' '9' '3'

- Want to work with as **int** or **double**

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Turning a String into an int
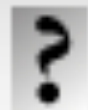
- What if you try this?

```
int value = row.get("year");
```

Turning a String into an int

- What if you try this?

```
int value = row.get("year");
```

incompatible types: java.lang.String cannot be converted to int

Turning a String into an int

- What if you try this?

```
int value = row.get("year");
```


https://commons.apache.org/proper/commons-csv/archives/1.2/apidocs/index.html

redefined

Method Summary

| All Methods | Instance Methods | Concrete Methods |

Modifier and Type	Method and Description
String	get(Enum<?> e) Returns a value by Enum.
String	get(int i) Returns a value by index.
String	get(String name) Returns a value by name.

Two Questions

- Two questions:

  - Why is this a problem?

  - How can you fix it?

  ```
  int value = row.get("year");
  ```
  1493 ⟵ "1493"

Why Is This a Problem?

- String might not represent a number

- Different representations
  - Everything is a number, but...

```
int value = row.get("year");
```
???   ⟵   "hello"

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How Do You Fix It?

```
int value = row.get("year");
```

- Need to explicitly convert
  - Algorithm: read characters, produce **int**
- Built in to Java
  - **Integer.parseInt**

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How Do You Fix It?

```
String yearStr = row.get("year");
int value = Integer.parseInt(yearStr);
```

- Need to explicitly convert
  - Algorithm: read characters, produce **int**
- Built in to Java
  - **Integer.parseInt**

Parsing Numbers

- **`Double.parseDouble`**: similar

  - Works for numbers with fractional part

  - "42.56"

- Invalid inputs?

  - **`Integer.parseInt("hello")`**

- Exception:

  - Indicates problem—can crash program

  - More advanced—code can handle it

Summary

- Cannot just assign **String** to **int**

- Use **Integer.parseInt**

- Real numbers: **Double.parseDouble**

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