CSc 337 Javascript

Benjamin Dicken

What is Javascript?

- Different language than Java, though some similarities
- Sometimes referred to as ECMAScript
- Has variables, for loops, objects, arrays (lists), functions
- JsLint

How Do I Run Javascript?

- The web console
- NodeJS
- Web runners, such as https://playcode.io

Data Types

`boolean`	`number`	`string`	`object`	`array`
true or false It's… well… a boolean	64 bit float No integer division Use **math.round()** to get an "int"	No char/str distinction Single or double quotes \ for escaping	Key value pairs Much like a dictionary in python	Like an array or list from other languages Behind the scenes, still just an **object**

Objects - The Building Block of JS

```javascript
// Javascript

wordCounts = {};

wordCounts['the'] = 10;

wordCounts.at = 15;

console.log(wordCounts);
```

```python
# Python

word_counts = {}

word_counts['the'] = 10

word_counts['at'] = 15

print(word_counts)
```

While Loop and If Statement

```javascript
// Javascript

let i = 0;
while (i < 30) {
  if (i % 2 == 0) {
    console.log(i + " is even");
  }
  i += 1;
}
```

```python
# Python

i = 0
while i < 30:
  if i % 2 == 0:
    print(i, "is even" )
  i += 1
```

Average Numbers

- Write a program that requests a string from the user in the form of comma separated numbers and should determine the average of all the numbers in the string
- Don’t use built-in average / count functions
- Can use **`window.prompt()`** and **`string.split()`**
- For example:

Input: **`102,107,204,378,192,100,100`**
Output: **`197.71...`**

Average Numbers

```
numbers = window.prompt('Give me numbers')
numbers = numbers.split(',')
total = 0
count = 0
while (count < numbers.length) {
  total += parseFloat(numbers[count]);
  count += 1;
}
alert('The average is: ' + (total / count));
```

Arrays - Really Just Objects

```javascript
// Javascript

groceryList = [];
groceryList.push('egg');
groceryList.push('bacon');

console.log(groceryList[0]);

for (i in groceryList) {
  console.log(groceryList[i]);
}
```

```python
# Python

grocery_list = []
grocery_list.append('egg')
grocery_list.append('bacon')

print(grocery_list[0])

for i in range(len(grocery_list)):
    print(grocery_list[i])
```

Functions

```javascript
// Javascript

function sum(a, b, c) {
  return a + b + c;
}

function sum(numbers) {
  result = 0;
  for (var i = 0; i < numbers.length; i++) {
    result += numbers[i];
  }
  return result;
}
```

```python
# Python

def sum(a, b, c):
    return a + b + c

def sum(numbers):
    result = 0
    for element in numbers:
        result += element
    return result
```

var / let / *(nothing)*

https://stackoverflow.com/questions/762011/whats-the-difference-between-using-let-and-var

```
name = 'ben'

function validateName(len) {
  name = 'daniel'
  if (name.length > len) {
    console.log('name not OK');
  } else {
    console.log('name OK');
  }
}



validateName(15);
console.log(name);
```

```
name = 'ben';

function validateName(len) {
  var name = 'daniel';
  if (name.length > len) {
    var name = 'dicken';
    console.log('name not OK');
  } else {
    console.log('name OK');
  }
}



validateName(15);
console.log(name);
```

```
name = 'ben';

function validateName(len) {
  var name = 'daniel';
  if (name.length > len) {
    let name = 'dicken';
    console.log('name not OK');
  } else {
    console.log('name OK');
  }
  name = 'charles';
}

validateName(15);
console.log(name);
```

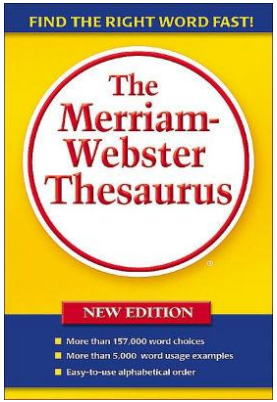
Write the function is_palindrome_word

- A palindrome is a string that reads the same both forwards and backwards. Some examples of palindromes:
  - civic, radar, rotator

- `is_palindrome_word('civic')` should return `True`
- `is_palindrome_word('non')` should return `True`
- `is_palindrome_word('contemporary')` should return `False`

```
function isPalindromeWord(word) {
    var splitString = word.split("");
    var reverseArray = splitString.reverse();
    var result = reverseArray.join("");
    return word == result;
}
```

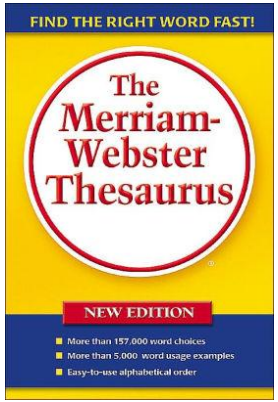
Add an additional similar word for 'slow'



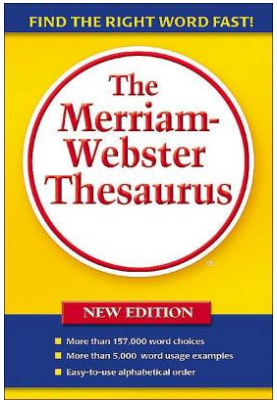

```
thesaurus =
    { 'fast'      : ['quick', 'agile', 'speedy'],
      'old'       : ['aged', 'antique'],
      'slow'      : ['sluggish', 'gradual'],
      'difficult' : ['hard', 'challenging', 'arduous'],
      'strong'    : ['durable', 'robust'] }
```

https://www.thesaurus.com

```
> brave
words similar to brave are:
   courageous fearless
> difficult
words similar to difficult are:
   hard arduous challenging
> instant
Sorry, I do not know that word
> exit
```



```
> brave
words similar to brave are:
   courageous fearless
> ADD
What word to add? brave
What is a similar word? adventurous
> brave
words similar to brave are:
   courageous adventurous fearless
> exit
```



In Python

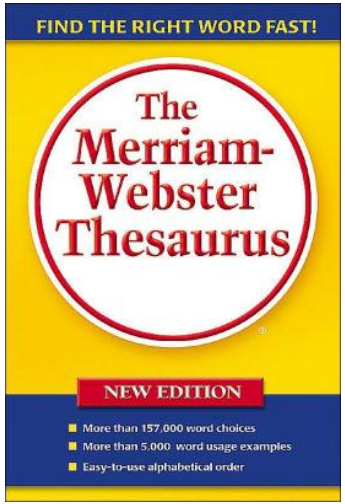
```
def add_word(thes, base_word, similar_word):
    if base_word not in thes:
        thes[base_word] = set()
    thes[base_word].add(similar_word)

def add_line(thes, line):
    sp = line.split(' : ')
    for word in sp[1].split(' '):
        add_word(thes, sp[0], word)

def load_thesaurus(thes):
    f = open('thesaurus.txt', 'r')
    lines = f.readlines()
    for line in lines:
        add_line(thes, line.strip('\n'))
```

```
def save_thesaurus(thes):
    f = open('thesaurus.txt', 'w')
    for k, v in thes.items():
        l = list(v)
        f.write(k + ' : ' + ' '.join(l) + '\n')
    f.close()

def main():
    thesaurus = {}
    load_thesaurus(thesaurus)
    while True:
        text = input('> ')
        if text == 'exit':
            break
        if text.startswith('ADD'):
            word = input('What word to add? ')
            similar_word = input('What is a similar word? ')
            add_word(thesaurus, word, similar_word)
        else:
            if text in thesaurus:
                similar = thesaurus[text]
                print('words similar to ' + text + ' are:')
                print('  ' + ' '.join(similar))
            else:
                print('Sorry, I do not know that word')
main()
```



Let’s build it in JS