SOLVING TRICKY PROBLEMS

Presto REACTO!

SOME FACTS

- **The FSA Admissions exam assesses for two things:**
  - Knowledge of fundamental JS
  - Problem solving ability
- ***How do Engineers solve tricky problems?***

PROBLEM SOLVING

- **Identify the problem**
- **Brainstorm solutions**
- **Implement one**
- **Evaluate it**

R estate

E xamples

A pproach

C ode

T est

O ptimize

RESTATE

- **Rephrase in your own words (diagram if useful)**
- **Make sure you fully understand the problem**
- **Leads very naturally into…**

EXAMPLES

- **Representative input and output**
- **Consider edge cases**
- **Consider errors**
- **Write them down**

APPROACH

- **Come up with at least one *conceptual* solution**
- **Don’t code yet!**
- **Make some comments in your code file**

CODE

- **Translate your *Approach* into working JS**
- **FSA Admissions Team will even give partial credit for a solid approach (*even if the code isn't complete*)**
- **Make sure include all those edge cases!**

TEST

- **Use Examples in the test specs to hone your solution**
- **Ensure your Code works for all Examples**
- **Debug as necessary**

OPTIMIZE

- **The final (and least important) step!**
- **Only if your code works and you have plenty of time**
- **Is there a more concise way to write this code?**
- **Are there built-in methods that can help?**
- **Did I document my code so it is easy to understand?**

EXAMPLE

- *“Create a function* **vowelCount()** *that takes a string as an argument. The function should return the total number of vowels in the string”*

RESTATE

- *“I want to return the total number of vowels in a string argument”.*
  - *Do I include ‘y’?*
  - *Is it case sensitive?*
  - *What if I get an empty string?*

EXAMPLES

- *vowelCount('hello') => 2*
- *vowelCount('Yummy Food') => 5*
- *vowelCount('') => 0*

APPROACH

- *I will loop over every character in the string.*
- *For each character, I will convert to Lower Case, and check if it exists in a string of vowels.*
- *If it does, I will increment my vowelCount*
- *After my loop, I will return the total vowelCount*

CODE / TEST

```
function vowelCount(str) {
  let vowels = 'aeiouy';
  let vowelCount = 0;
  for (let i = 0; i < str.length; i++) {
    let char = str[i].toLowerCase();
    for (let j = 0; j < vowels.length; j++) {
      let vowel = vowels[j];
      if (vowel === char) {
        vowelCount++;
        break;
      }
    }
  }
  return vowelCount;
}
```

OPTIMIZE

```
function vowelCount(str) {
  let vowels = 'aeiouy';
  let vowelCount = 0;
  for (let i = 0; i < str.length; i++) {
    let char = str[i].toLowerCase();
    if (vowels.indexOf(char) >= 0) {
      vowelCount++;
    }
  }
  return vowelCount;
}
```

TODAY'S PROBLEM

- **Today you will build a *Caesar Cypher,*** an encryption scheme favored by the Ancient Romans
- Your function will take a string, and a number of characters. It should shift each character in the string by that number of letters
- Example: “dog” shifted by 4 => “hsk”

ET TU REACTO?

R estate

E xamples

A pproach

C ode

T est

O ptimize