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

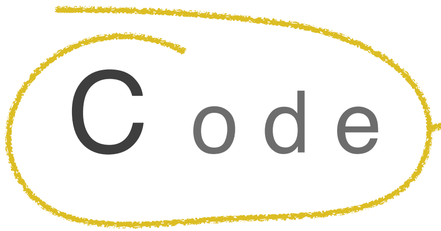
E xamples

A pproach

C ode

T est

O ptimize



Notice how far down this is

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

    return vowelCount
}
```

OPTIMIZE

```
function vowelCount(str){
    var vowels = 'aeiouy'; // string of vowels
    var vowelCount = 0; // initialize vowel count
    for(var i = 0; i < str.length; i++){ // loop over string
        var char = str[i].toLowerCase();
        if(vowels.indexOf(char) >= 0) { // if character is in vowels
          vowelCount++ // increment vowelCount
        }
    }

    return vowelCount // return total vowels
}
```

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

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