

HTML Nano framework design

1. In General:

I need to design python class called HTML_Element that will represent N-ary tree node as root node and then that has capability to make N-child for each node. That it's the best data structure for HTML elements to represent each element with all sub elements, grandchild and so on.

2. Full design

2.1. Make instance

2.1.1. Problems:

- Use tag name that isn't a real HTML tag.
- Use ID that already exist.

2.1.2. Solutions:

- make static array that have all HTML tags so that when create new element, check if the tag name is exist in this array and if NOT then throw an exception.
- generate static hash set to store all used IDs and when the new ID is existed then throw an exception

2.2. append: add new Element to element as a child

2.2.1. problem:

- Use an ID that already used.

2.2.2. Solution:

- Verify that new id is NOT existed in used IDs set, if exist then throw exception. otherwise, add the new Element as child of element.

2.3. Render: print element tree as HTML string

2.3.1. Problem:

- respect level indentation

2.3.2. solution:

- print tree by pre-order traversal Technique and each time that we traverse a child, add tab before print.

2.4. findByAttribute: get all elements that has an attribute value

2.4.1. solution:

- declare new list of elements, make tree traversal and add elements with the target attribute value to the list.

2.5. findByTag: get all element by tagName

2.5.1. solution:

- declare new list of elements, make tree traversal and add elements with the target tag name to the list.

2.6. renderHTML: generate full HTML file that ready to run

2.6.1. solution:

- open DOCTYPE tag, html head with needed meta tags. Then open body tag, call render method inside it and close body tag and DOCTYPE tag.