

REVIEW

In this lesson, you have successfully built a tree data structure in JavaScript. You have implemented:

- a `TreeNode` class that contains data and maintains a collection of `TreeNode` classes called children.
- an `.addChild()`

Preview: Docs Loading link description

[method](#)

that adds a child to the tree as either data or `TreeNode`

- a `.removeChild()` method that removes a child from the tree as either data or `TreeNode`
- a `.depthFirstTraversal()` recursive method that fully traverses the tree with a top-down approach for each child of the tree
- a `.breadthFirstTraversal()` iterative method that fully traverses the tree a level at a time, instead of a child at a time

Congratulations!!

Instructions

1. Checkpoint 1 Passed

1.

In this exercise, we've constructed a sample menu tree, however some of the meal items are in the wrong category. Can you spot which ones and place them in the correct locations?

Open **script.js** and run it. You will see a pretty printout of the menu tree.

Menu

-- Breakfast

-- -- Cereal

-- -- BBQ Chicken

-- -- Oatmeal

-- Lunch

-- -- Soup

-- -- Sandwich

-- -- Lasagna

-- Dinner

-- -- Yogurt

-- -- Filet Mignon

-- -- Fish Florentine

2. Checkpoint 2 Passed

2.

Two entries in the menu tree are dislocated. Write code to move each one to the correct location. Print the tree under the title Corrected Menu.

Hint

Look under Breakfast and Dinner. BBQ Chicken and Yogurt need to be switched. Remove them from the tree and then add them to the tree at the right locations.

3. Checkpoint 3 Passed

3.

Choose a tree traversal method whose output resembles the ordering of `.print()` and call it.

Hint

Depth-first traversal of the tree would produce the closest output to `.print()`.

TreeNode.js

```
class TreeNode {  
  constructor(data) {  
    this.data = data;  
    this.children = [];  
  }  
  
  addChild(child) {  
    if (child instanceof TreeNode) {  
      this.children.push(child);  
    } else {  
      this.children.push(new TreeNode(child));  
    }  
  }  
}
```

```

removeChild(childToRemove) {
  const length = this.children.length;
  this.children = this.children.filter(child => {
    return childToRemove instanceof TreeNode
    ? child !== childToRemove
    : child.data !== childToRemove;
  });

  if (length === this.children.length) {
    this.children.forEach(child => child.removeChild(childToRemove));
  }
}

```

```

print(level = 0) {
  let result = "";
  for (let i = 0; i < level; i++) {
    result += '-- ';
  }
  console.log(`${result}${this.data}`);
  this.children.forEach(child => child.print(level + 1));
}

```

```

depthFirstTraversal() {
  console.log(this.data);
  this.children.forEach(child => child.depthFirstTraversal());
}

```

```

breadthFirstTraversal() {

```

```

let queue = [ this ];
while (queue.length > 0) {
  const current = queue.shift();
  console.log(current.data);
  queue = queue.concat(current.children);
}
}
};

```

```

module.exports = TreeNode;

```

script.js

```

const TreeNode = require('./TreeNode');

const menu = new TreeNode('Menu');

const entries = {
  'Breakfast' : [ 'Cereal', 'BBQ Chicken', 'Oatmeal' ],
  'Lunch' : [ 'Soup', 'Sandwich', 'Lasagna' ],
  'Dinner' : [ 'Yogurt', 'Filet Mignon', 'Fish Florentine' ]
};

const meals = Object.keys(entries);
for (let meal=0; meal < meals.length; meal++){
  menu.addChild(meals[meal]);
  const entrylist = entries[meals[meal]];
  entrylist.forEach( entry => {
    menu.children[meal].addChild(entry);
  });
};

```

```
}
```

```
menu.print();
```

```
// remove BBQ Chicken from Breakfast
```

```
menu.removeChild('BBQ Chicken');
```

```
// add BBQ Chicken to Dinner
```

```
menu.children[2].addChild('BBQ Chicken');
```

```
// remove Yogurt from Dinner
```

```
menu.removeChild('Yogurt');
```

```
// add Yogurt to Breakfast
```

```
menu.children[0].addChild('Yogurt');
```

```
console.log('----- Corrected Menu');
```

```
menu.print();
```

```
menu.depthFirstTraversal();
```

>> Output

```
Menu
```

```
-- Breakfast
```

```
-- -- Cereal
```

```
-- -- BBQ Chicken
```

```
-- -- Oatmeal
```

```
-- Lunch
```

```
-- -- Soup
```

```
-- -- Sandwich
```

```
-- -- Lasagna
```

```
-- Dinner
```

-- -- Yogurt

-- -- Filet Mignon

-- -- Fish Florentine