**Identify the Big-O Notation of the following Blocks of Codes**: (Identify and Discuss the Block of Codes' Structure which complies to the identified Notation)

const productList = ["Shoes", "Shirt", "Hat", "Bag"];

const findProductPairs (products) => {

const pairs = [];

for (let i = 0; i < products.length; i++) {

for(let j = i + 1; j < products.length; j++) {

pairs.push('${products[i]} and ${products[j]}');

}

}

return pairs;

}

console.log(findProductPairs(productlist));

module.exports = { findProductPairs };

The provided block of code generates all possible pairs of products from a given list. The **Big-O Notation** for this code is **O(n^2)**, which means quadratic time complexity. This is due to the nested loops that each iterate over the list of products.

1. **Array Declaration**: The array productList is declared with four initial elements. This operation is **O(1)** since it's just initializing a fixed number of elements.
2. **Outer Loop (i)**:
   * The outer loop runs from i = 0 to i < products.length. In the worst case, this loop runs n times, where n is the length of the array.
3. **Inner Loop (j)**:
   * The inner loop runs from j = i + 1 to j < products.length. For each iteration of the outer loop, the inner loop runs fewer times (n - i - 1), but in big-O notation, this is approximated by n.
4. **Appending Pairs**: The operation pairs.push('${products[i]} and ${products[j]}') is a constant time operation (**O(1)**).

Since there are two nested loops, each running up to n times, the overall time complexity is **O(n^2)**.

**Code Structure:**

1. **Outer Loop**: Iterates over all elements starting from the first to the second last element (**O(n)**).
2. **Inner Loop**: For each element from the outer loop, it iterates over the subsequent elements in the list, generating pairs (**O(n)** within **O(n)**, leading to **O(n^2)**).

In summary, the findProductPairs function has a quadratic time complexity of **O(n^2)**, making it less efficient for large arrays due to the nested loops.