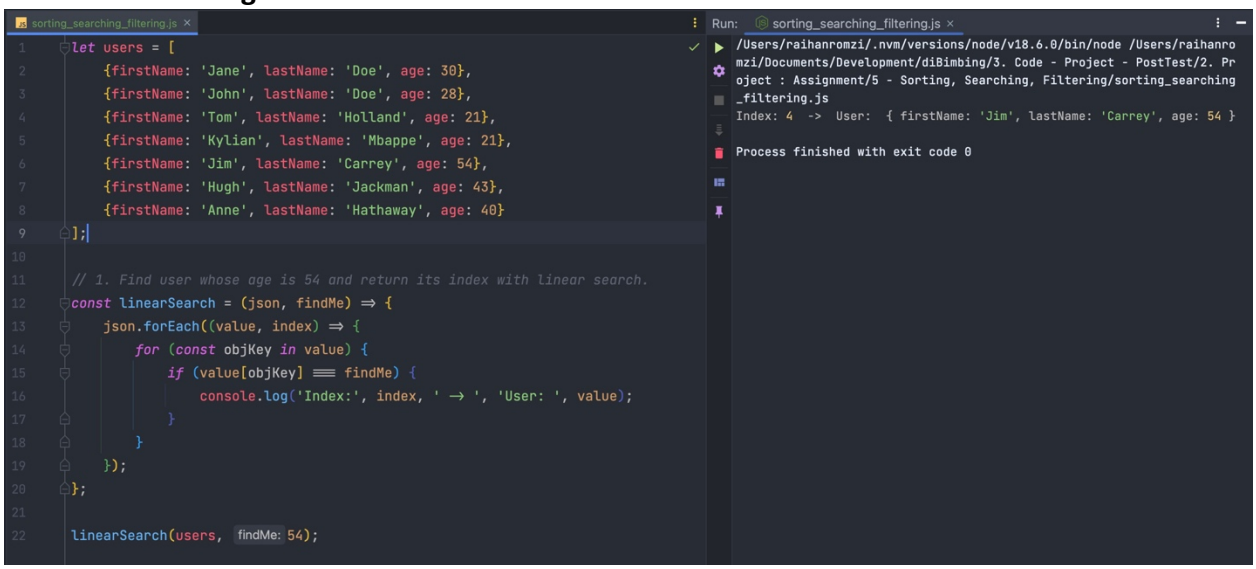
**Nama : Raihan Romzi R**
**Batch : 9**

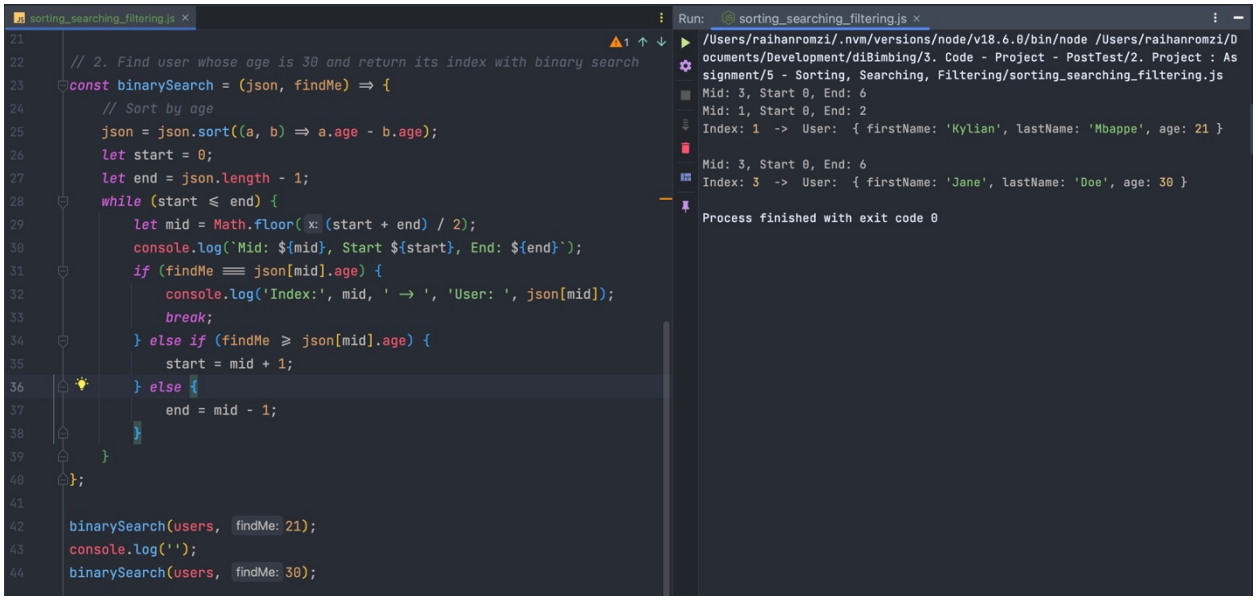
## 1. Find user whose age is 54 and return its index with linear search



```
let users = [
    {firstName: 'Jane', lastName: 'Doe', age: 30},
    {firstName: 'John', lastName: 'Doe', age: 28},
    {firstName: 'Tom', lastName: 'Holland', age: 21},
    {firstName: 'Kylian', lastName: 'Mbappe', age: 21},
    {firstName: 'Jim', lastName: 'Carrey', age: 54},
    {firstName: 'Hugh', lastName: 'Jackman', age: 43},
    {firstName: 'Anne', lastName: 'Hathaway', age: 40}
];

// 1. Find user whose age is 54 and return its index with linear search.
const linearSearch = (json, findMe) => {
    json.forEach((value, index) => {
        for (const objKey in value) {
            if (value[objKey] === findMe) {
                console.log('Index:', index, ' -> ', 'User: ', value);
            }
        }
    });
};

linearSearch(users, findMe: 54);
```

```
/Users/raihanromzi/.nvm/versions/node/v18.6.0/bin/node /Users/raihanromzi/Documents/Development/diBimbing/3. Code - Project - PostTest/2. Project : Assignment/5 - Sorting, Searching, Filtering/sorting_searching_filtering.js
Index: 4  ->  User:  { firstName: 'Jim', lastName: 'Carrey', age: 54 }

Process finished with exit code 0
```

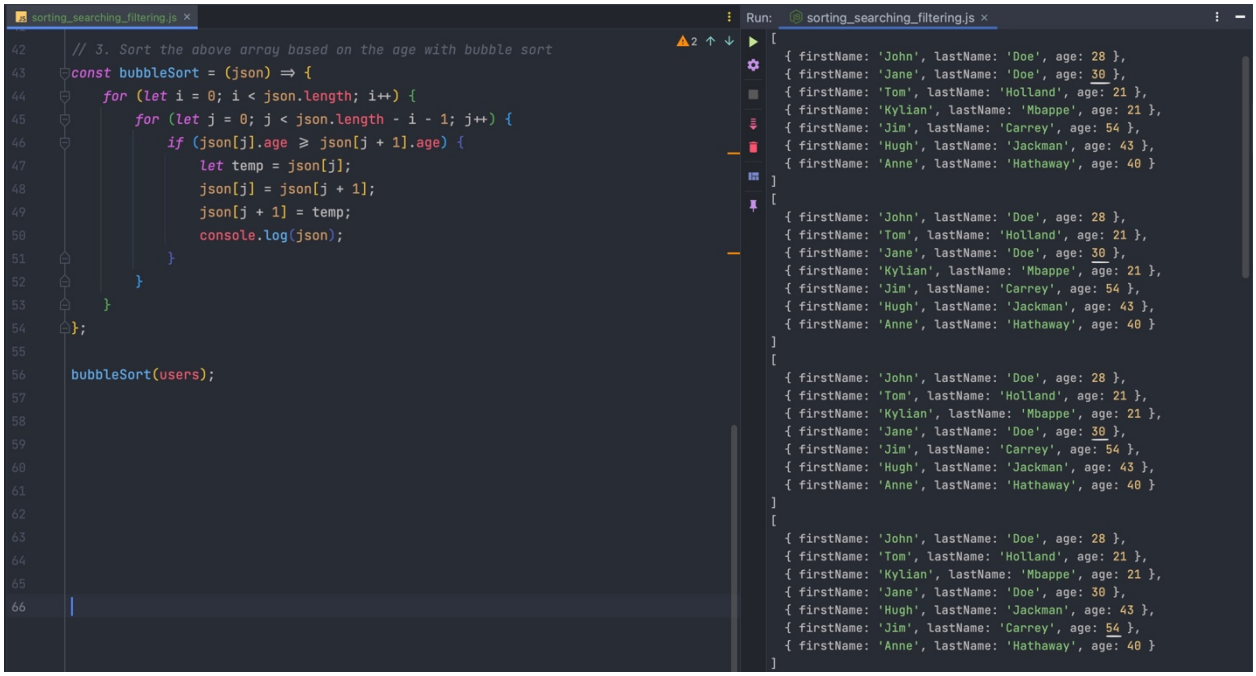
## 2. Find user whose age is 54 and return its index with linear search



```
// 2. Find user whose age is 30 and return its index with binary search
const binarySearch = (json, findMe) => {
    // Sort by age
    json = json.sort((a, b) => a.age - b.age);
    let start = 0;
    let end = json.length - 1;
    while (start <= end) {
        let mid = Math.floor( x: (start + end) / 2);
        console.log(`Mid: ${mid}, Start ${start}, End: ${end}`);
        if (findMe === json[mid].age) {
            console.log('Index:', mid, ' -> ', 'User: ', json[mid]);
            break;
        } else if (findMe >= json[mid].age) {
            start = mid + 1;
        } else {
            end = mid - 1;
        }
    }
};

binarySearch(users, findMe: 21);
console.log('');
binarySearch(users, findMe: 30);
```

```
/Users/raihanromzi/.nvm/versions/node/v18.6.0/bin/node /Users/raihanromzi/Documents/Development/diBimbing/3. Code - Project - PostTest/2. Project : Assignment/5 - Sorting, Searching, Filtering/sorting_searching_filtering.js
Mid: 3, Start 0, End: 6
Mid: 1, Start 0, End: 2
Index: 1  ->  User:  { firstName: 'Kylian', lastName: 'Mbappe', age: 21 }

Mid: 3, Start 0, End: 6
Index: 3  ->  User:  { firstName: 'Jane', lastName: 'Doe', age: 30 }

Process finished with exit code 0
```

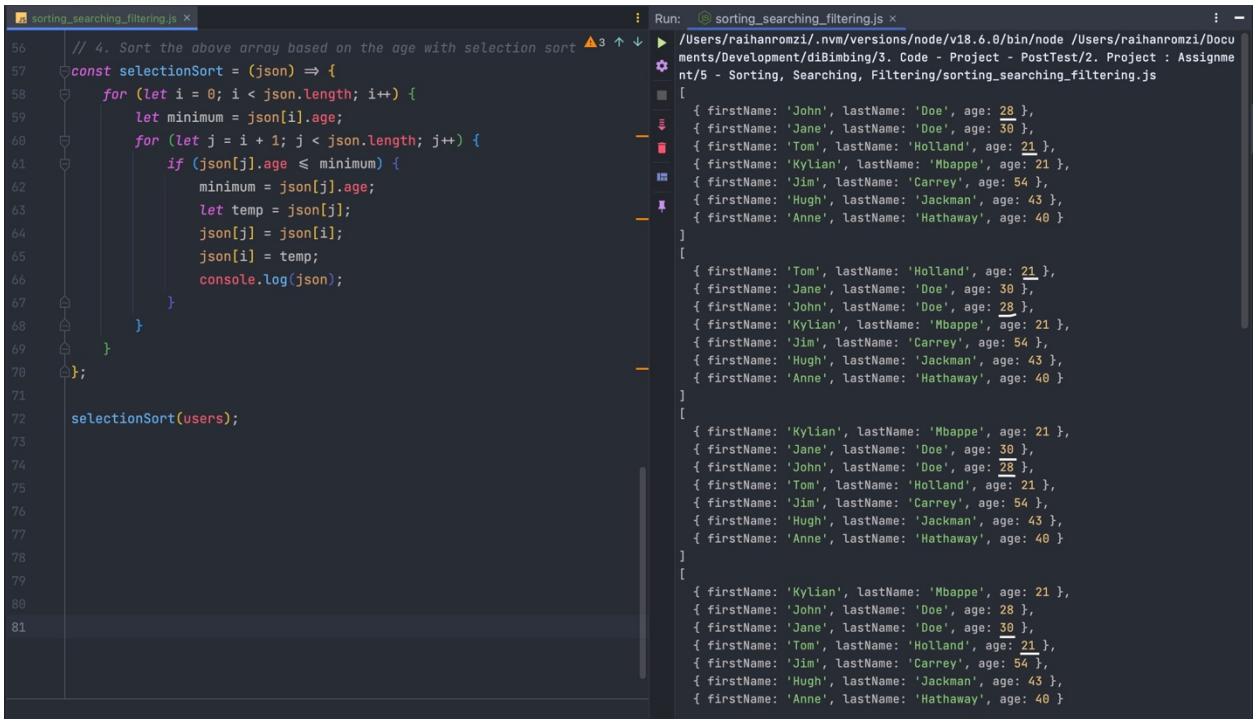
## 3. Sort the above array based on the age with bubble sort



```
// 3. Sort the above array based on the age with bubble sort
const bubbleSort = (json) => {
    for (let i = 0; i < json.length; i++) {
        for (let j = 0; j < json.length - i - 1; j++) {
            if (json[j].age >= json[j + 1].age) {
                let temp = json[j];
                json[j] = json[j + 1];
                json[j + 1] = temp;
                console.log(json);
            }
        }
    }
};

bubbleSort(users);
```

```
[
  { firstName: 'John', lastName: 'Doe', age: 28 },
  { firstName: 'Jane', lastName: 'Doe', age: 30 },
  { firstName: 'Tom', lastName: 'Holland', age: 21 },
  { firstName: 'Kylian', lastName: 'Mbappe', age: 21 },
  { firstName: 'Jim', lastName: 'Carrey', age: 54 },
  { firstName: 'Hugh', lastName: 'Jackman', age: 43 },
  { firstName: 'Anne', lastName: 'Hathaway', age: 40 }
]
[
  { firstName: 'John', lastName: 'Doe', age: 28 },
  { firstName: 'Tom', lastName: 'Holland', age: 21 },
  { firstName: 'Jane', lastName: 'Doe', age: 30 },
  { firstName: 'Kylian', lastName: 'Mbappe', age: 21 },
  { firstName: 'Jim', lastName: 'Carrey', age: 54 },
  { firstName: 'Hugh', lastName: 'Jackman', age: 43 },
  { firstName: 'Anne', lastName: 'Hathaway', age: 40 }
]
[
  { firstName: 'John', lastName: 'Doe', age: 28 },
  { firstName: 'Tom', lastName: 'Holland', age: 21 },
  { firstName: 'Kylian', lastName: 'Mbappe', age: 21 },
  { firstName: 'Jane', lastName: 'Doe', age: 30 },
  { firstName: 'Jim', lastName: 'Carrey', age: 54 },
  { firstName: 'Hugh', lastName: 'Jackman', age: 43 },
  { firstName: 'Anne', lastName: 'Hathaway', age: 40 }
]
[
  { firstName: 'John', lastName: 'Doe', age: 28 },
  { firstName: 'Tom', lastName: 'Holland', age: 21 },
  { firstName: 'Kylian', lastName: 'Mbappe', age: 21 },
  { firstName: 'Jane', lastName: 'Doe', age: 30 },
  { firstName: 'Hugh', lastName: 'Jackman', age: 43 },
  { firstName: 'Jim', lastName: 'Carrey', age: 54 },
  { firstName: 'Anne', lastName: 'Hathaway', age: 40 }
]
```

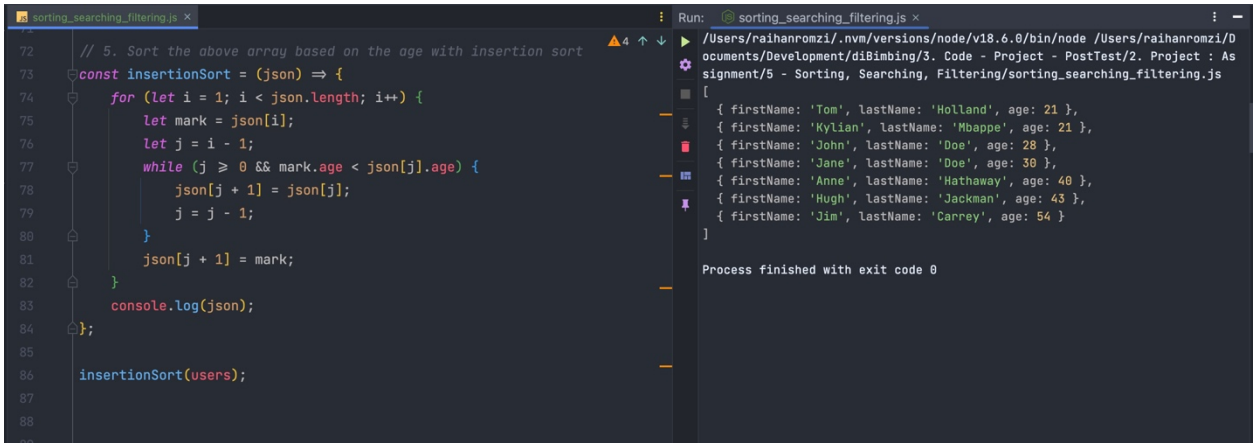
## 4. Sort the above array based on the age with selection sort



```
// 4. Sort the above array based on the age with selection sort
const selectionSort = (json) => {
    for (let i = 0; i < json.length; i++) {
        let minimum = json[i].age;
        for (let j = i + 1; j < json.length; j++) {
            if (json[j].age <= minimum) {
                minimum = json[j].age;
                let temp = json[j];
                json[j] = json[i];
                json[i] = temp;
                console.log(json);
            }
        }
    }
};

selectionSort(users);
```

```
/Users/raihanromzi/.nvm/versions/node/v18.6.0/bin/node /Users/raihanromzi/Documents/Development/diBimbing/3. Code - Project - PostTest/2. Project : Assignment/5 - Sorting, Searching, Filtering/sorting_searching_filtering.js
[
  { firstName: 'John', lastName: 'Doe', age: 28 },
  { firstName: 'Jane', lastName: 'Doe', age: 30 },
  { firstName: 'Tom', lastName: 'Holland', age: 21 },
  { firstName: 'Kylian', lastName: 'Mbappe', age: 21 },
  { firstName: 'Jim', lastName: 'Carrey', age: 54 },
  { firstName: 'Hugh', lastName: 'Jackman', age: 43 },
  { firstName: 'Anne', lastName: 'Hathaway', age: 40 }
]
[
  { firstName: 'Tom', lastName: 'Holland', age: 21 },
  { firstName: 'Jane', lastName: 'Doe', age: 30 },
  { firstName: 'John', lastName: 'Doe', age: 28 },
  { firstName: 'Kylian', lastName: 'Mbappe', age: 21 },
  { firstName: 'Jim', lastName: 'Carrey', age: 54 },
  { firstName: 'Hugh', lastName: 'Jackman', age: 43 },
  { firstName: 'Anne', lastName: 'Hathaway', age: 40 }
]
[
  { firstName: 'Kylian', lastName: 'Mbappe', age: 21 },
  { firstName: 'Jane', lastName: 'Doe', age: 30 },
  { firstName: 'John', lastName: 'Doe', age: 28 },
  { firstName: 'Tom', lastName: 'Holland', age: 21 },
  { firstName: 'Jim', lastName: 'Carrey', age: 54 },
  { firstName: 'Hugh', lastName: 'Jackman', age: 43 },
  { firstName: 'Anne', lastName: 'Hathaway', age: 40 }
]
[
  { firstName: 'Kylian', lastName: 'Mbappe', age: 21 },
  { firstName: 'John', lastName: 'Doe', age: 28 },
  { firstName: 'Jane', lastName: 'Doe', age: 30 },
  { firstName: 'Tom', lastName: 'Holland', age: 21 },
  { firstName: 'Jim', lastName: 'Carrey', age: 54 },
  { firstName: 'Hugh', lastName: 'Jackman', age: 43 },
  { firstName: 'Anne', lastName: 'Hathaway', age: 40 }
]
```

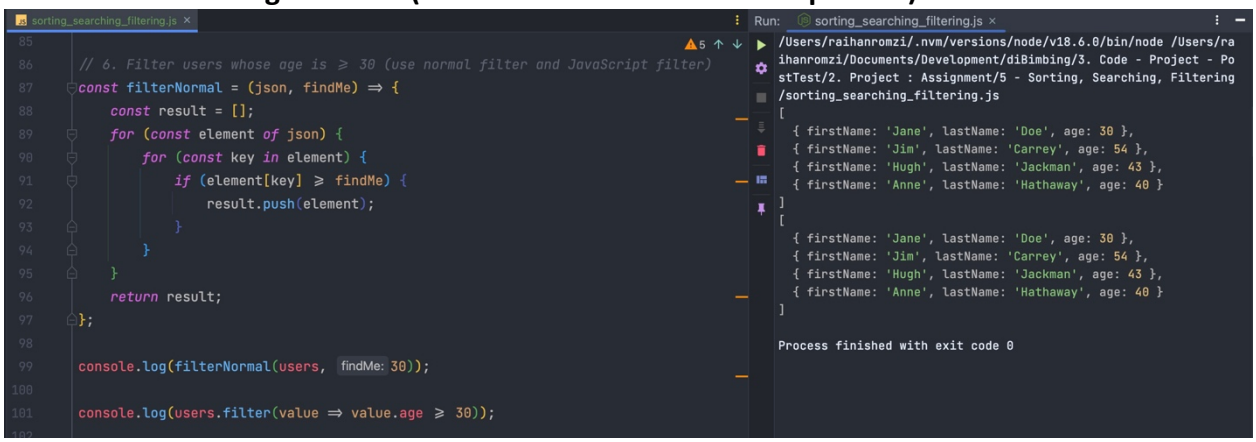
## 5. Sort the above array based on the age with insertion sort



```
// 5. Sort the above array based on the age with insertion sort
const insertionSort = (json) => {
    for (let i = 1; i < json.length; i++) {
        let mark = json[i];
        let j = i - 1;
        while (j >= 0 && mark.age < json[j].age) {
            json[j + 1] = json[j];
            j = j - 1;
        }
        json[j + 1] = mark;
    }
    console.log(json);
};

insertionSort(users);
```

```
/Users/raihanromzi/.nvm/versions/node/v18.6.0/bin/node /Users/raihanromzi/Documents/Development/diBimbing/3. Code - Project - PostTest/2. Project : Assignment/5 - Sorting, Searching, Filtering/sorting_searching_filtering.js
[
  { firstName: 'Tom', lastName: 'Holland', age: 21 },
  { firstName: 'Kylian', lastName: 'Mbappe', age: 21 },
  { firstName: 'John', lastName: 'Doe', age: 28 },
  { firstName: 'Jane', lastName: 'Doe', age: 30 },
  { firstName: 'Anne', lastName: 'Hathaway', age: 40 },
  { firstName: 'Hugh', lastName: 'Jackman', age: 43 },
  { firstName: 'Jim', lastName: 'Carrey', age: 54 }
]

Process finished with exit code 0
```

## 6. Filter users whose age is >= 30 (use normal filter and JavaScript filter)



```
// 6. Filter users whose age is >= 30 (use normal filter and JavaScript filter)
const filterNormal = (json, findMe) => {
    const result = [];
    for (const element of json) {
        for (const key in element) {
            if (element[key] >= findMe) {
                result.push(element);
            }
        }
    }
    return result;
};

console.log(filterNormal(users, findMe: 30));

console.log(users.filter(value => value.age >= 30));
```

```
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[
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  { firstName: 'Hugh', lastName: 'Jackman', age: 43 },
  { firstName: 'Anne', lastName: 'Hathaway', age: 40 }
]
[
  { firstName: 'Jane', lastName: 'Doe', age: 30 },
  { firstName: 'Jim', lastName: 'Carrey', age: 54 },
  { firstName: 'Hugh', lastName: 'Jackman', age: 43 },
  { firstName: 'Anne', lastName: 'Hathaway', age: 40 }
]

Process finished with exit code 0
```