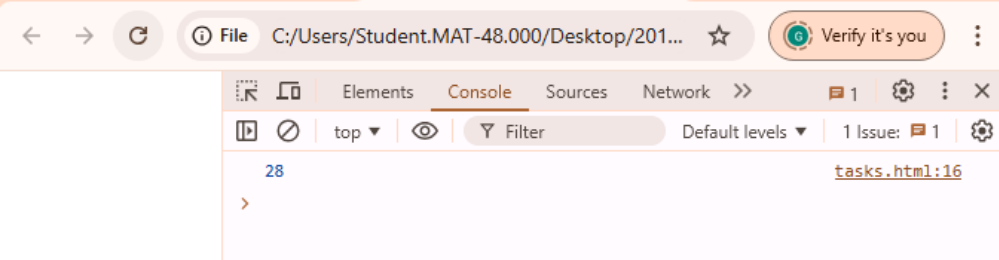
JSON VARIABLE LENGTH ARGUMENTS/SPREAD SYNTAX

TASK-1

```
<html>
<head>
</head>
<body>
<script>
function sum(...arguments)
{
let total = 0;
for(let num of arguments)
{
total+=num;
}
return total;
}
console.log(sum(9,8,6,5));
</script>
</body>
</html>
```

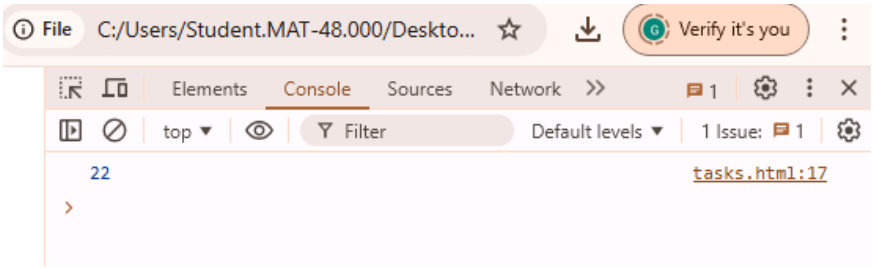
Output:



Task 2:

```
<html>

<body>

<script>

function sum(...arguments)

{

let total = 0;

for(let num of arguments)

{

total+=num;

}

return total;

}

const arr = [5,6,4,7]

console.log(sum(...arr));

</script>

</body>

</html>
```

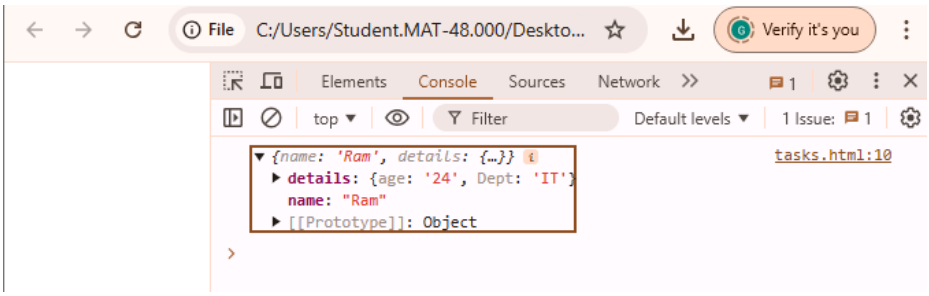
OUTPUT:



TASK-3

```
<html>

<body>

<script>

function deepclone(obj)

{

return JSON.parse(JSON.stringify(obj));

}

const originalobj = {name:"Ram",details:{age: "24",Dept : "IT"}};

const cloneobj = deepclone(originalobj);

console.log(cloneobj);

</script>

</body>

</html>
```

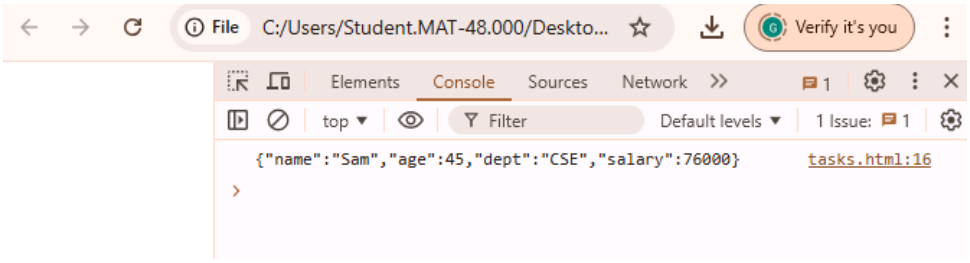
OUTPUT:



TASK-4

```
<!DOCTYPE html>
<html>
<body>
<script>
let student =
{
name:"Sam",
age:32,
dept:"CSE"
};
let Employee = {
name:"Sam",
age:45,
salary:76000
};
let obj = {...student,...Employee};
console.log(JSON.stringify(obj));
</script>
</body>
</html>
```

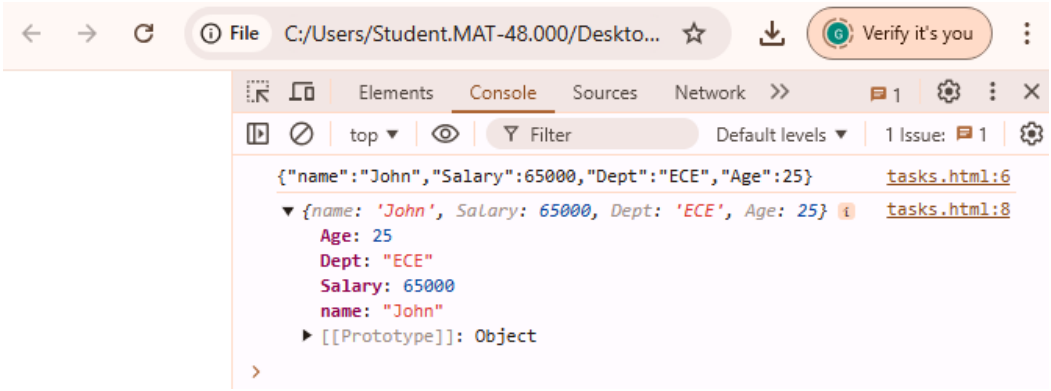
OUTPUT:



TASK-5

```
<!DOCTYPE html>

<html>

<body>

<script>

const obj = {name:"John",Salary:65000,Dept:"ECE",Age:25};

let jsonString = JSON.stringify(obj);

console.log(jsonString);

let parseobj = JSON.parse(jsonString);

console.log(parseobj);

</script>

</body>

</html>
```

OUTPUT:

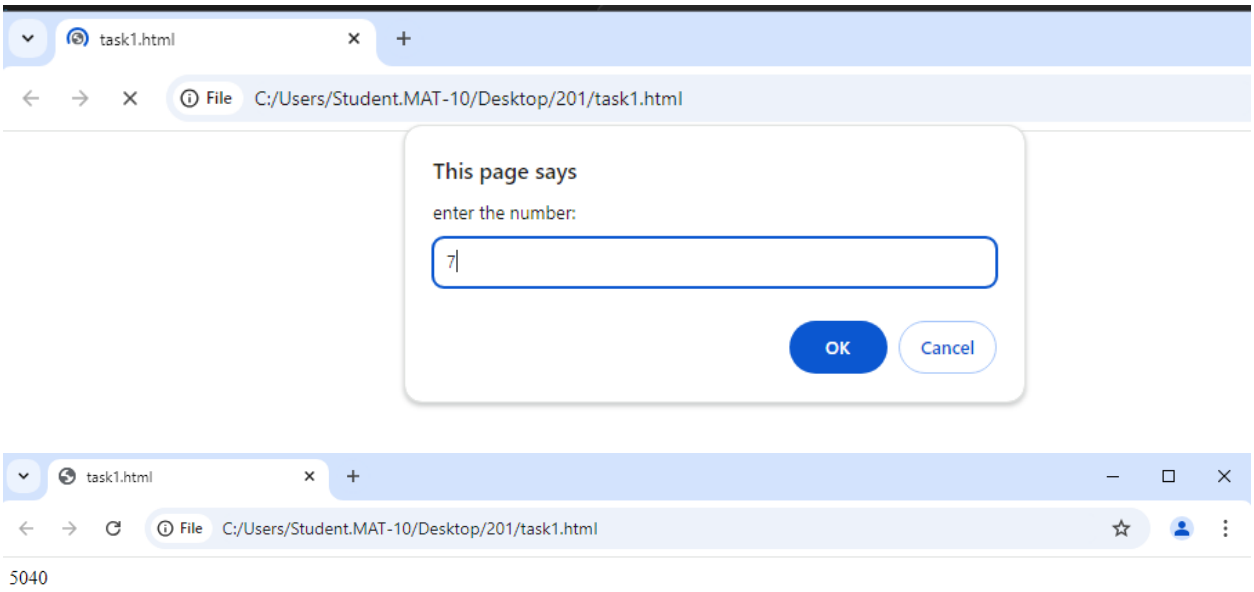


RECURSION

TASK 1:

```
<html>
    <body>
        <script>
            function factorial(n)
            {
                if(n==0)
                return 1;
                else
                return n*factorial(n-1);
            }
            let a=parseInt(prompt("enter the number:"));
            document.write(factorial(a));
        </script>
    </body>
</html>
```

OUTPUT:

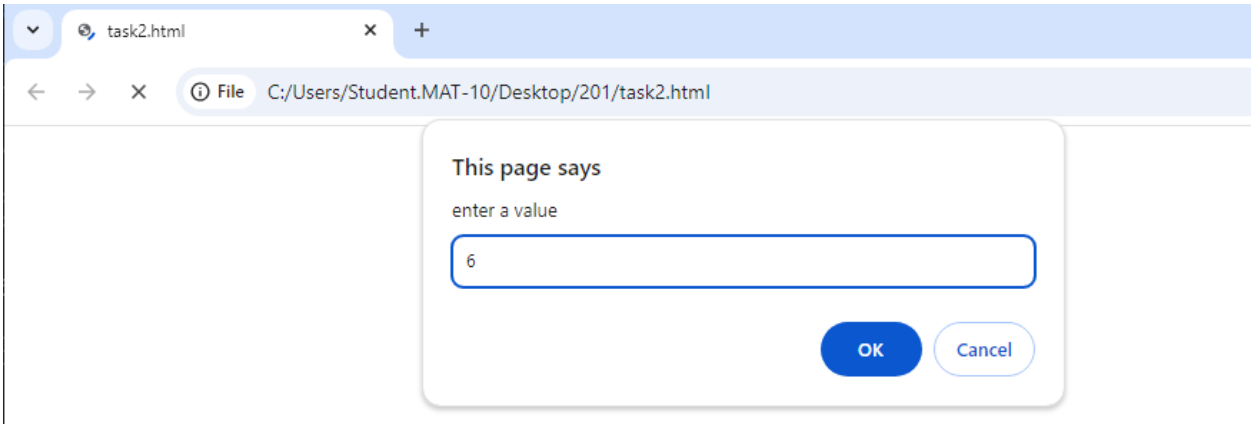


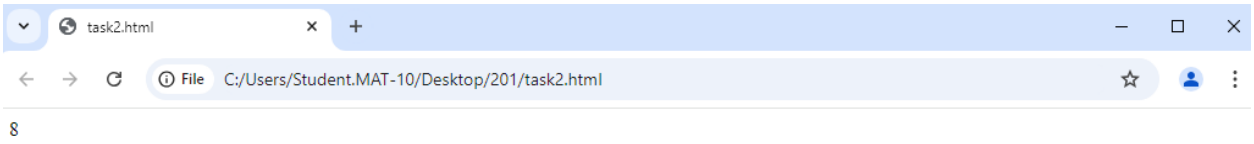
TASK 2:

```
<html>
    <body>
        <script>
            function fibonnacci(n){
                if(n<=1)
                return n;
```

```
            return fibonnacci(n-1)+fibonnacci(n-2);
        }
        let a=parseInt(prompt("enter a value"));
        document.write(fibonnacci(a));

    </script>
</body>
</html>
```

OUTPUT:



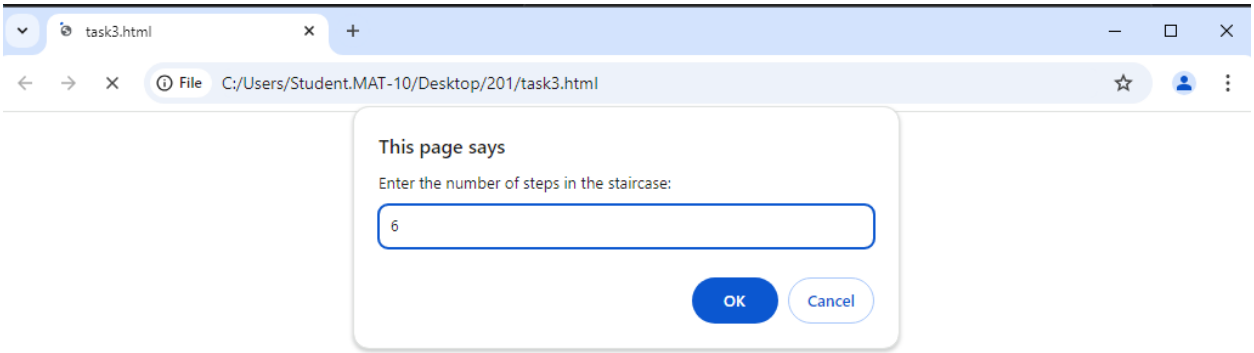


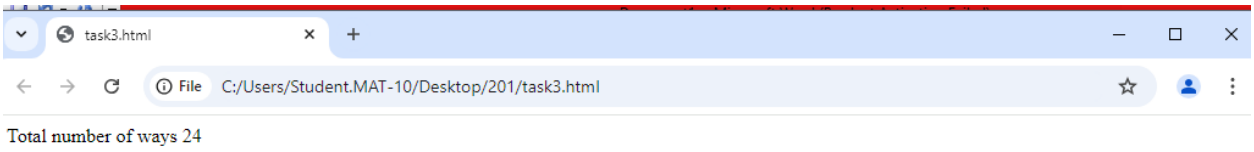
TASK 3:

```
<html>
    <body>
        <script>
            function countWays(n) {
                if (n === 0) {
                    return 1;
                } else if (n === 1) {
                    return 1;
                } else if (n === 2) {
                    return 2;
                } else if (n === 3) {
                    return 4;
                }
                return countWays(n - 1) + countWays(n - 2) + countWays(n - 3);
            }
```

```
            let n = parseInt(prompt("Enter the number of steps in the
staircase:"));
            document.write("Total number of ways  " + countWays(n));
        </script>
    </body>
</html>
```

OUTPUT:



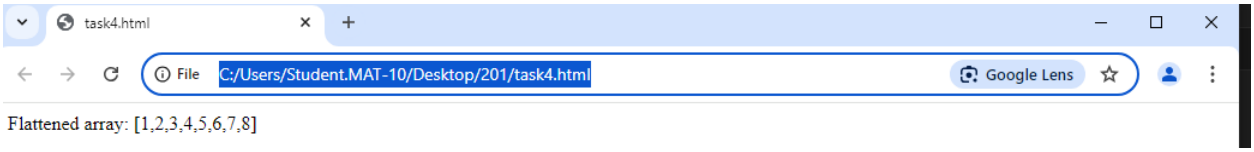


TASK 4:

```
<html>
    <body>
        <script>
            function flattenArray(arr) {
                var result = [];
                for (var i = 0; i < arr.length; i++) {
                    var item = arr[i];
                    if (Array.isArray(item)) {
                        result = result.concat(flattenArray(item));
                    } else {
                        result.push(item);}
                }
                return result;
            }
            var nestedArray = [1, [2, 3, [4, 5]], [6, 7], 8];
            var flattened = flattenArray(nestedArray);
            document.write("Flattened array: " + JSON.stringify(flattened));
```

```
        </script>
    </body>
</html>
```

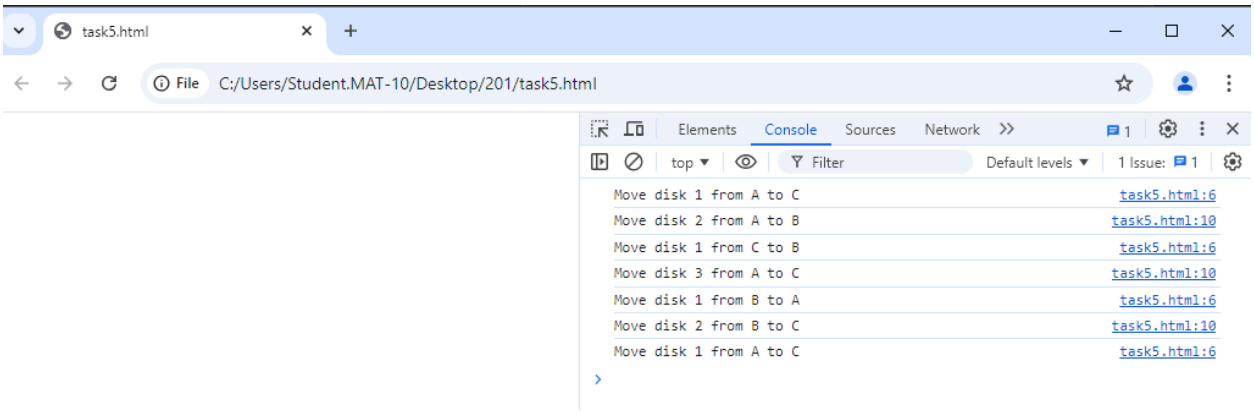
OUTPUT:



TASK 5:

```
<html>
<body>
    <script>
        function towerOfHanoi(n, source, target, auxiliary) {
    if (n === 1) {
        console.log(`Move disk 1 from ${source} to ${target}`);
        return;
    }
    towerOfHanoi(n - 1, source, auxiliary, target);
    console.log(`Move disk ${n} from ${source} to ${target}`);
    towerOfHanoi(n - 1, auxiliary, target, source);
}
const n = 3;
towerOfHanoi(n, 'A', 'C', 'B');
    </script>
</body>
</html>
```

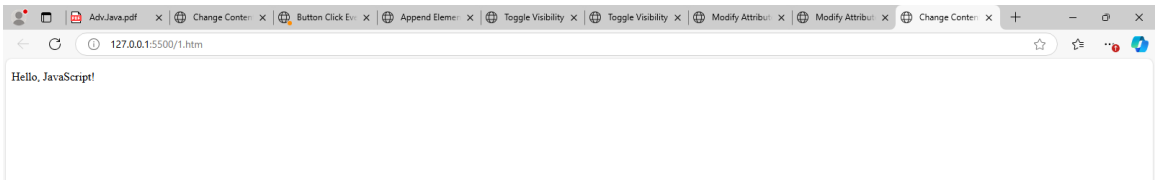
OUTPUT:



TASK1:

```
<!DOCTYPE html>
<html>
<head>
  <title>Change Content</title>
</head>
<body>
  <p id="my">Hello, World!</p>
  <script>
    document.getElementById("my").innerHTML = "Hello, JavaScript!";
  </script>
</body>
</html>
```

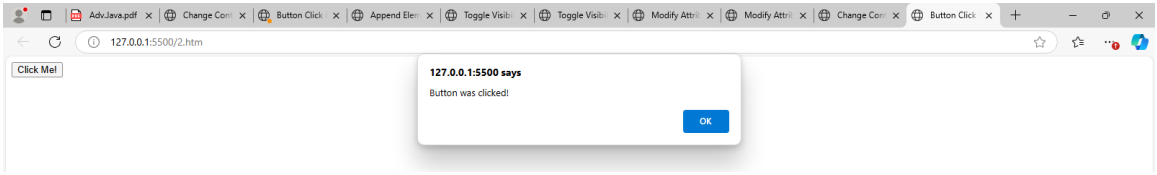
OUTPUT:



TASK2:

```
<!DOCTYPE html>
<html>
<head>
  <title>Button Click Event</title>
</head>
<body>
  <button id="myButton">Click Me!</button>
```

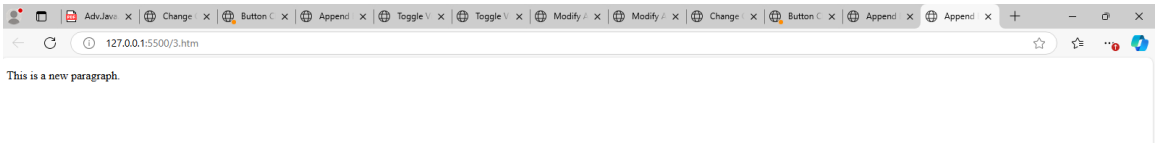
```
    <script>
        document.getElementById("myButton").addEventListener("click", function() {
            alert("Button was clicked!");
        });
    </script>
</body>
</html>
```



TASK3:

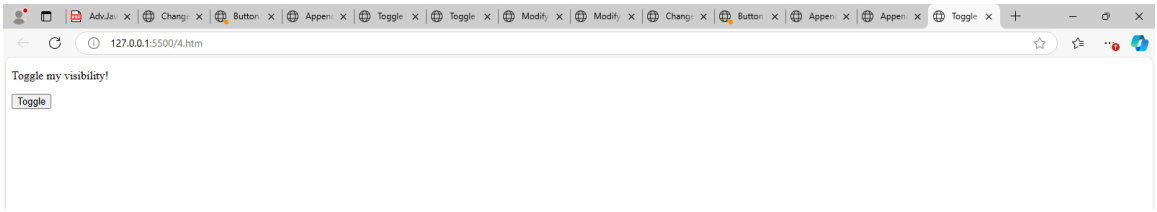
```
<!DOCTYPE html>
<html>
<head>
    <title>Append Element</title>
</head>
<body>
    <div id="container"></div>
    <script>
        var newElement = document.createElement("p");
        newElement.innerHTML = "This is a new paragraph.";
        document.getElementById("container").appendChild(newElement);
    </script>
</body>
</html>
```

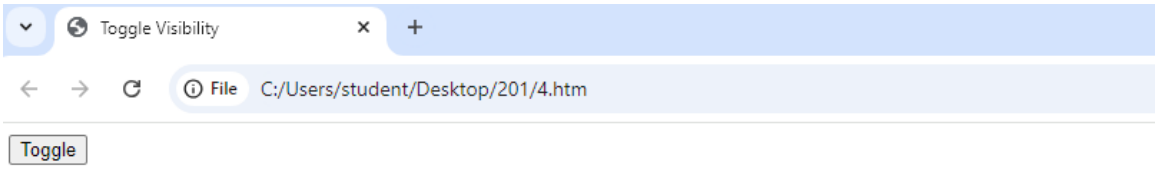
OUTPUT:



TASK4:

```
<!DOCTYPE html>
<html>
<head>
  <title>Toggle Visibility</title>
</head>
<body>
  <p id="toggleParagraph">Toggle my visibility!</p>
  <button id="toggleButton">Toggle</button>
  <script>
    document.getElementById("toggleButton").addEventListener("click", function() {
      var paragraph = document.getElementById("toggleParagraph");
      if (paragraph.style.display === "none") {
        paragraph.style.display = "block";
      } else {
        paragraph.style.display = "none";
      }
    });
  </script>
</body>
</html>
```





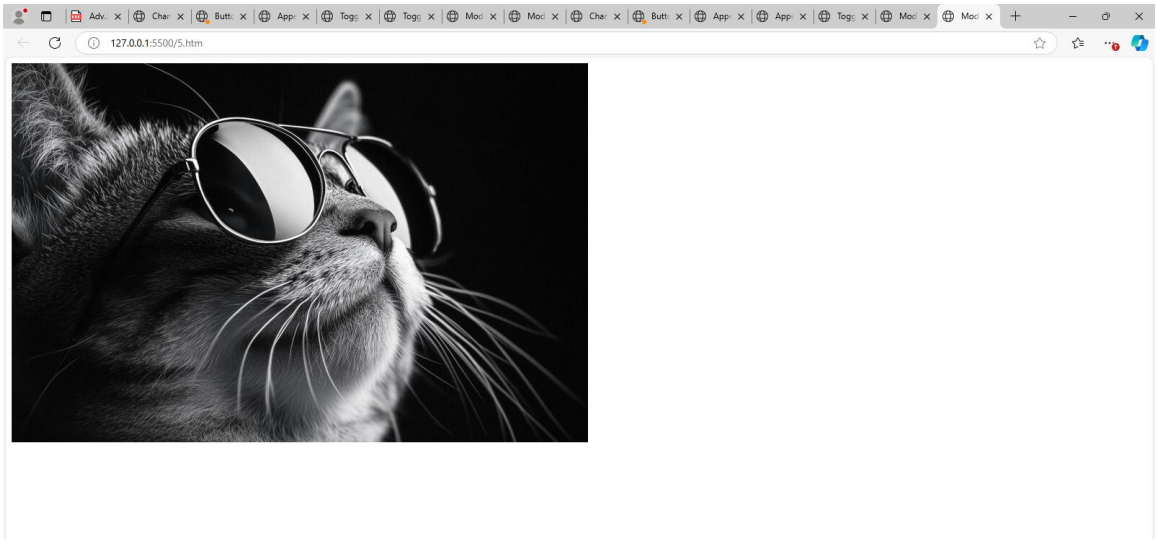
TASK5:

```
<!DOCTYPE html>
<html>
<head>
  <title>Modify Attributes</title>
</head>
<body>
  <img id="myImage" src="image.jpg" alt="Initial Image">
  <script>
    var image = document.getElementById("myImage");
    console.log(image.src);
    image.src = "newImage.jpg";
    console.log(image.alt);
    image.alt = "Updated Image";
  </script>
```

</body>

</html>

OUTPUT:



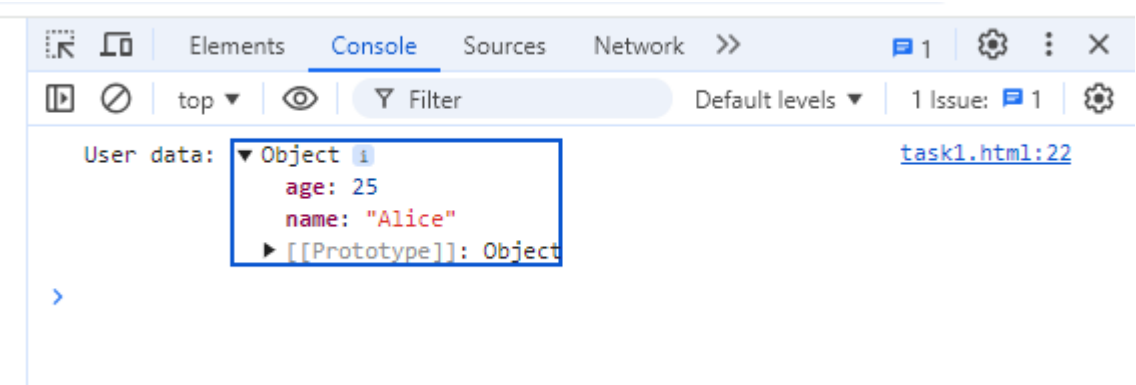
ASYNC/AWAIT

TASK 1:

```
<html>
  <body>
    <script>
      async function getUserData(userId) {
  const users = {
   1: { name: 'Alice', age: 25 },
   2: { name: 'Bob', age: 30 },
  };

  const getUser = new Promise((resolve, reject) => {
   setTimeout(() => {
    if (users[userId]) {
     resolve(users[userId]);
    } else {
     reject('User not found');
    }
   }, 1000);
  });

  try {
   const user = await getUser;
   console.log('User data:', user);
  } catch (error) {
```

```
    console.error('Error:', error);
  }
 }


 getUserData(1);
    </script>
  </body>
</html>
```

OUTPUT:

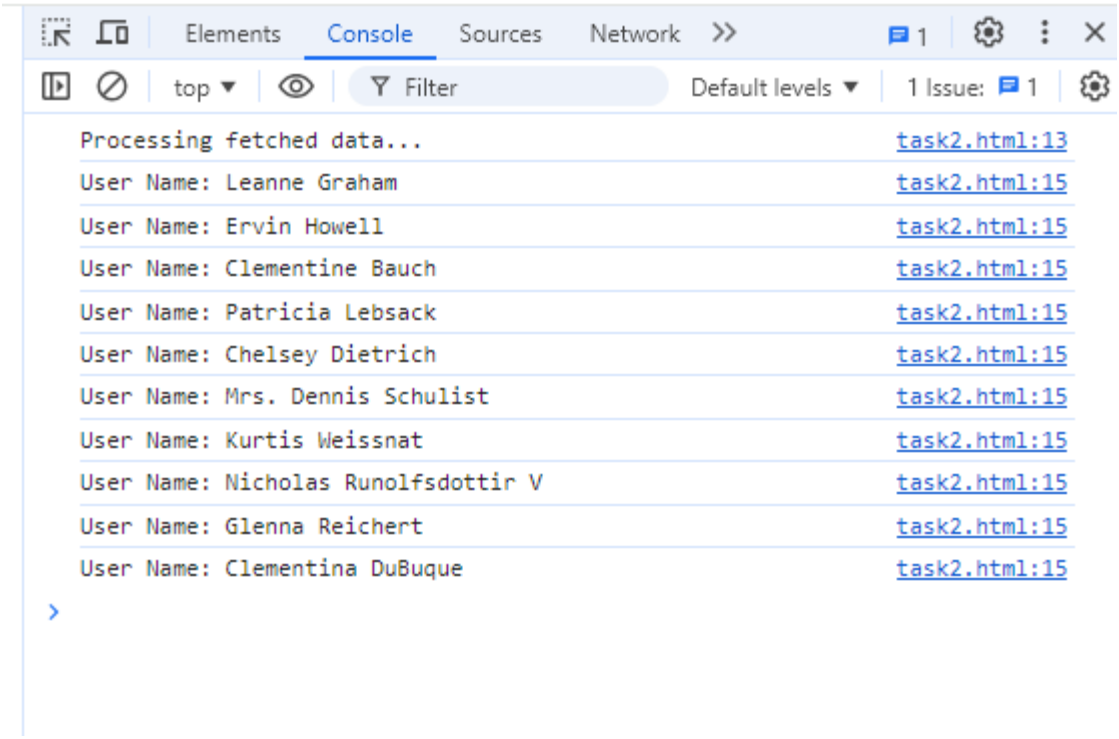


TASK 2:

```
<html>
  <body>
    <script>
async function fetchAndProcessData() {
 const apiUrl = 'https://jsonplaceholder.typicode.com/users';

 try {
  const response = await fetch(apiUrl);
  if (!response.ok) {
    throw new Error(`HTTP error! Status: ${response.status}`);
```

```
    }
    const data = await response.json();
    console.log('Processing fetched data...');
    data.forEach(user => {
      console.log(`User Name: ${user.name}`);
    });

  } catch (error) {
    console.error('Error fetching or processing data:', error);
  }
}
fetchAndProcessData();

      </script>
    </body>
</html>
```

OUTPUT:

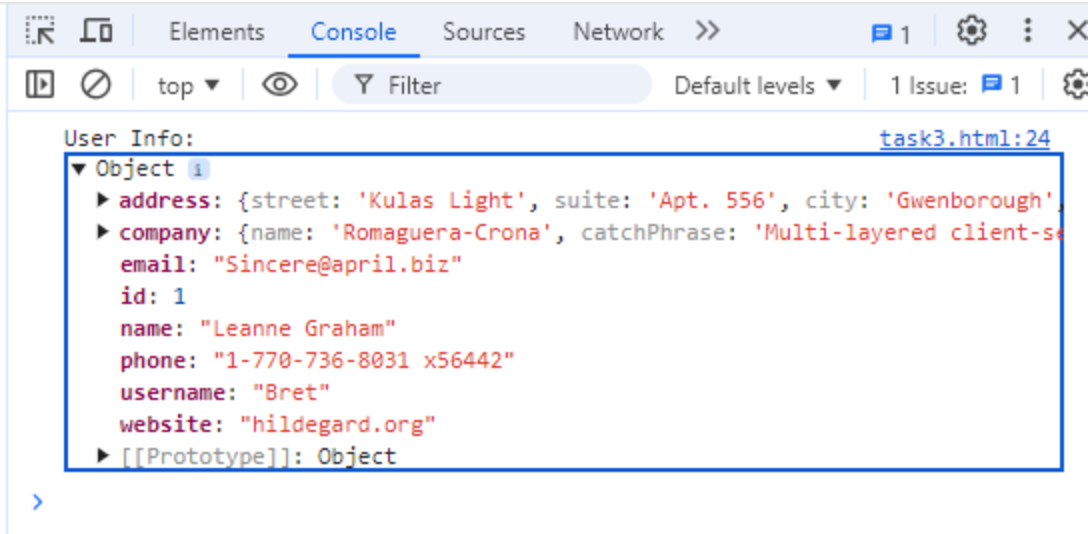


TASK 3:

```
<html>
  <body>
    <script>
    async function getUserInfo(userId) {
 try {
  const response = await fetch(`https://jsonplaceholder.typicode.com/users/1`);
  if (!response.ok) {
    throw new Error(`HTTP error! Status: ${response.status}`);
  }
  const user = await response.json();
  if (!user || !user.name || !user.email) {
    throw new Error('Invalid user data received');
  }
```

```
    return user;
  } catch (error) {
    console.error('Error getting user info:', error.message);
    return null;
  }
      }
getUserInfo(1)
  .then(user => {
    if (user) {
      console.log('User Info:', user);
    } else {
      console.log('Failed to get user info');
    }
  })
  .catch(error => {
    console.log('Unexpected error:', error);
  });
      </script>
    </body>
</html>
```

OUTPUT:

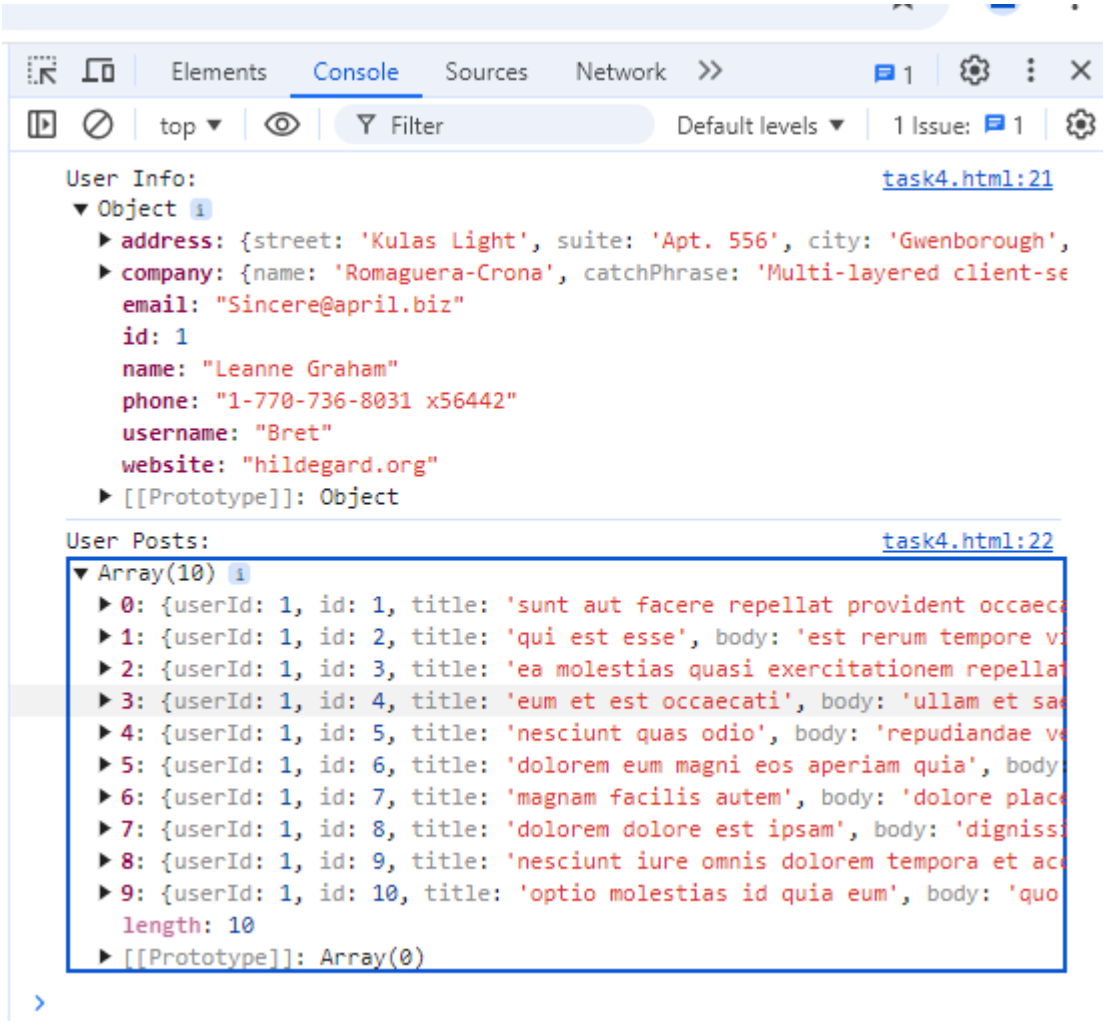


TASK 4:

```
<html>
  <body>
    <script>
async function fetchUser(userId) {
 const response = await fetch(`https://jsonplaceholder.typicode.com/users/${userId}`);
 if (!response.ok) throw new Error(`User with ID ${userId} not found`);
 return response.json();
}
async function fetchUserPosts(userId) {
 const response = await fetch(`https://jsonplaceholder.typicode.com/posts?userId=${userId}`);
 if (!response.ok) throw new Error(`Posts for user with ID ${userId} not found`);
 return response.json();
}
async function fetchUserAndPosts(userId) {
 try {
  const [user, posts] = await Promise.all([
    fetchUser(userId),
    fetchUserPosts(userId),
```

```
    ]);

    console.log('User Info:', user);
    console.log('User Posts:', posts);
  } catch (error) {
    console.error('Error:', error.message);
  }
}
fetchUserAndPosts(1);

      </script>
    </body>
</html>
```

OUTPUT:



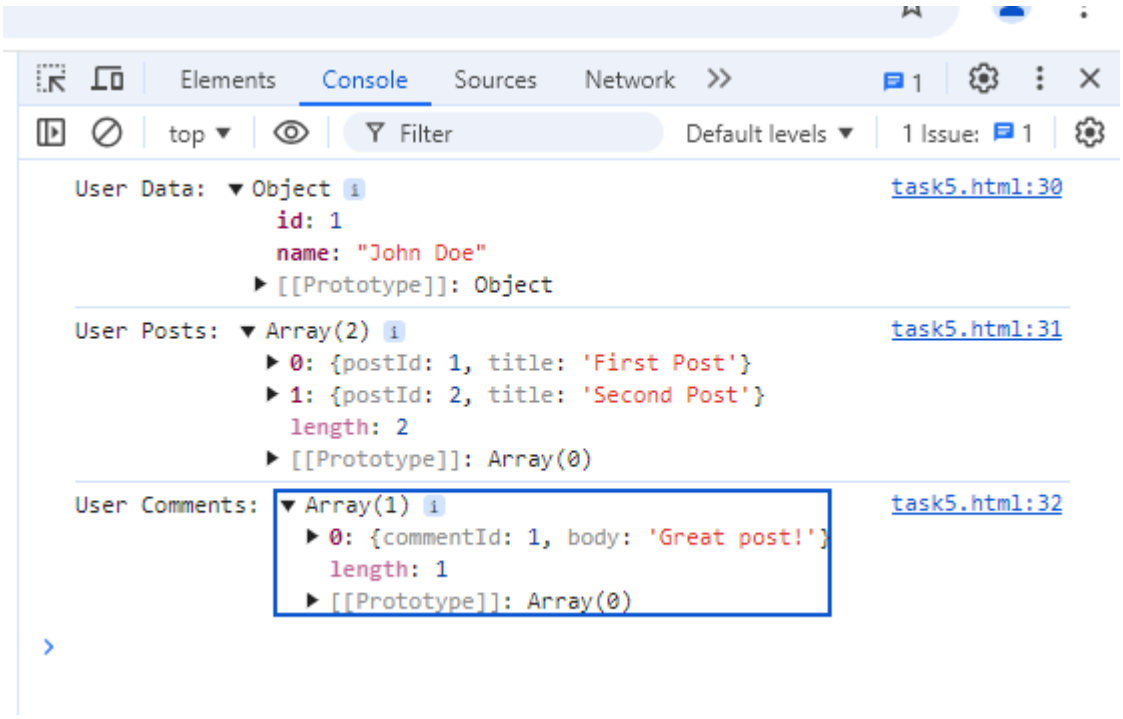
TASK 5:

```
<html>
  <body>
    <script>
async function fetchUser(userId) {
 const response = await new Promise((resolve) =>
  setTimeout(() => resolve({ id: userId, name: 'John Doe' }), 2000)
 );
 return response;
}
async function fetchUserPosts(userId) {
```

```
  const response = await new Promise((resolve) =>
    setTimeout(() => resolve([{ postId: 1, title: 'First Post' }, { postId: 2, title: 'Second Post' }]), 1500)
  );
  return response;
}
async function fetchUserComments(postId) {
  const response = await new Promise((resolve) =>
    setTimeout(() => resolve([{ commentId: 1, body: 'Great post!' }]), 1000)
  );
  return response;
}
async function fetchData(userId) {
  try {
    const [user, posts, comments] = await Promise.all([
      fetchUser(userId),
      fetchUserPosts(userId),
      fetchUserComments(1),
    ]);

    console.log('User Data:', user);
    console.log('User Posts:', posts);
    console.log('User Comments:', comments);

  } catch (error) {
    console.error('Error fetching data:', error.message);
  }
}
fetchData(1);
```

```
    </script>
  </body>
</html>
```

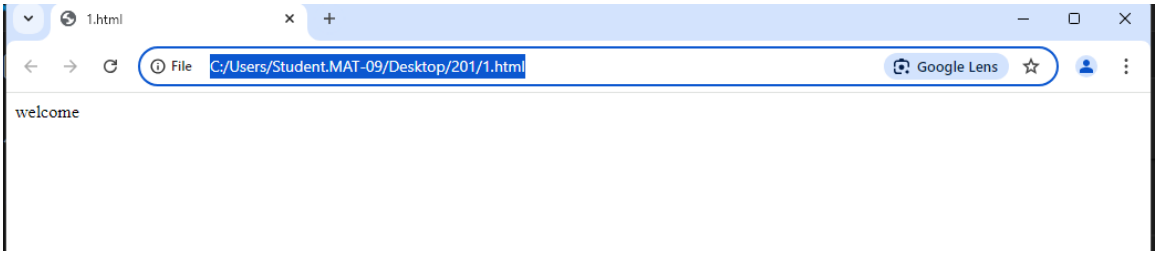
OUTPUT:



TASK 1:

```
<html>
<script>
const mypromise=new Promise((resolve)=>{
setTimeout(()=>
{
resolve("welcome");
},1000)
});
mypromise.then((value)=>{
document.write(value);
})
</script>
</html>
```

OUTPUT:

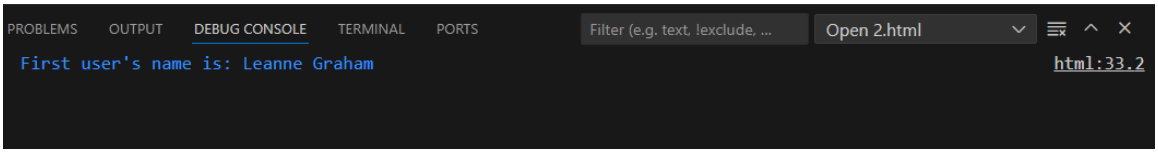


TASK2:

```
<html>
<script>
// Fetch data from an API (e.g., JSONPlaceholder)
function fetchData(url) {
return fetch(url)
.then(response => {
if (!response.ok) {
throw new Error('Network response was not ok');
}
return response.json(); // Parse the JSON data
});
}
// Process the fetched data (e.g., extract the name of the first user)
function processData(data) {
return new Promise((resolve, reject) => {
if (data && data.length > 0) {
// For example, return the name of the first user
resolve(`First user's name is: ${data[0].name}`);
} else {
reject('No data found to process.');
}
});
```

```
}
// Use the fetchData function to get data, then chain the processData function
const apiUrl = 'https://jsonplaceholder.typicode.com/users';
fetchData(apiUrl)
.then((data) => {
// Chain another promise to process the data
return processData(data);
})
.then((processedData) => {
console.log(processedData); // Output the processed data
})
.catch((error) => {
console.error('Error:', error); // Handle any errors
});
</script>
</html>
```

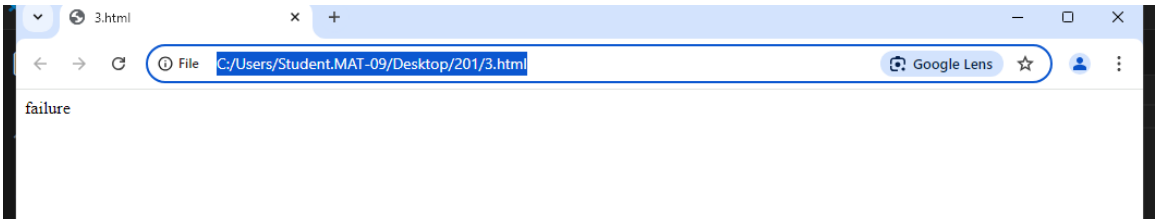
OUTPUT:



TASK3:

```
<html>
<script>
function random(){
return new Promise((resolve,reject)=>{
let random1=Math.random();
if(random1>0.5){
resolve("success");
}
else{
reject("failure");
}
});
}
random()
.then((value)=>{
document.write(value);
})
.catch((error)=>{
document.write(error);
})
</script>
</html>
```

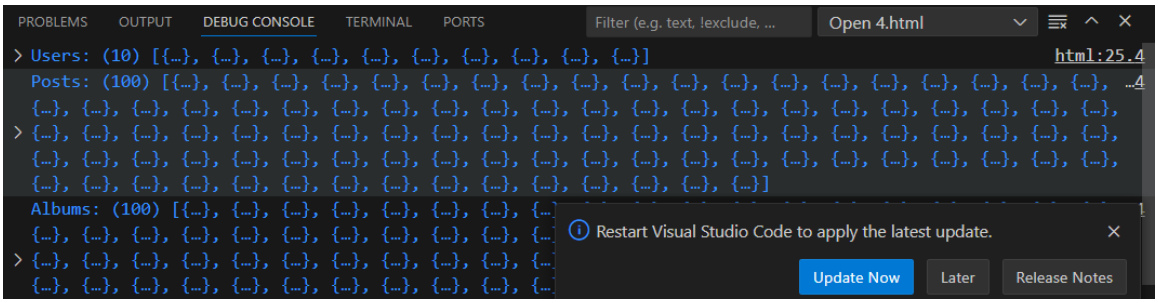
OUTPUT:



TASK4:

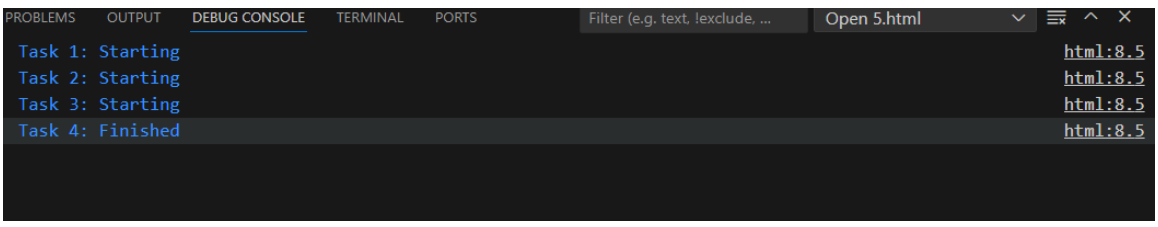
```
<html>
<script>
// URLs to fetch data from
const url1 = 'https://jsonplaceholder.typicode.com/users';
const url2 = 'https://jsonplaceholder.typicode.com/posts';
const url3 = 'https://jsonplaceholder.typicode.com/albums';
// Create an array of fetch promises
const fetchPromises = [
fetch(url1),
fetch(url2),
fetch(url3)
];
// Use Promise.all to fetch all resources in parallel
Promise.all(fetchPromises)
.then(responses => {
// All fetch requests are resolved, now process the responses
return Promise.all(responses.map(response => response.json())); // Convert all responses to JSON
})
.then(data => {
// Process the data from all the responses
const users = data[0];
const posts = data[1];
const albums = data[2];
console.log('Users:', users); // Output the users
console.log('Posts:', posts); // Output the posts
console.log('Albums:', albums); // Output the albums
})
.catch(error => {
// Handle any error from the fetch requests or data processing
console.error('Error:', error);
});
</script>
</html>
```

OUTPUT:



TASK5:

```
<html>
<script>
// Simulate an asynchronous task with a delay
function asyncTask(message, delay) {
return new Promise((resolve, reject) => {
setTimeout(() => {
console.log(message);
resolve(message);
}, delay);
});
}
// Chain promises to perform tasks in sequence
asyncTask("Task 1: Starting", 1000)
.then((result1) => {
// Task 1 is done, now run Task 2
return asyncTask("Task 2: Starting", 1500);
})
.then((result2) => {
// Task 2 is done, now run Task 3
return asyncTask("Task 3: Starting", 2000);
})
.then((result3) => {
// Task 3 is done, now run Task 4
return asyncTask("Task 4: Finished", 1000);
})
.catch((error) => {
console.error("Error:", error);
});
</script>
</html>
```

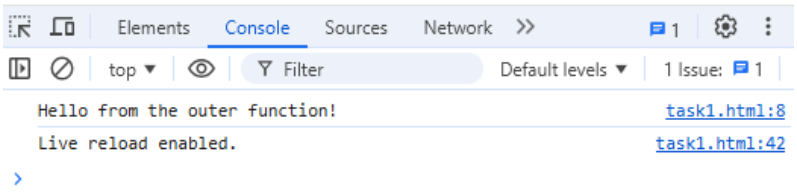


CLOSURE:

TASK 1:

```
<html>
  <body>
    <script>
function outer() {
  let message = "Hello from the outer function!";

  return function inner() {
    console.log(message);
}
}
const closureFunction = outer();
closureFunction();
</script>
</body>
</html>
```

OUTPUT:

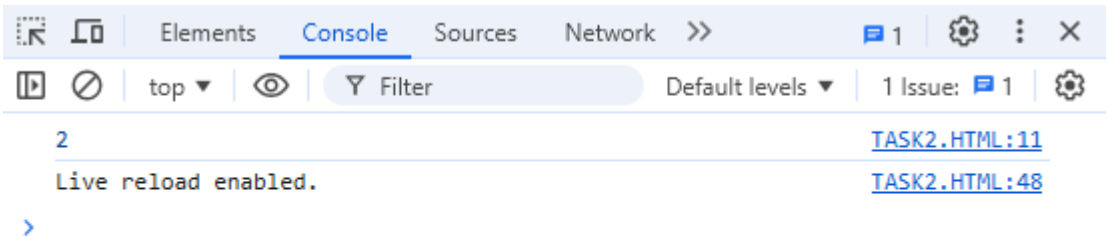


TASK 2:

```
<html>
  <body>
```

```
    <script>
    function createCounter() {
    let count = 0;
    return {
    increment: function() {
      count++;
    },
    getCount: function() {
      console.log(count);
    }
  };
}
const counter = createCounter();
counter.increment();
counter.increment();
counter.getCount();
  </script>
</body>
</html>
```

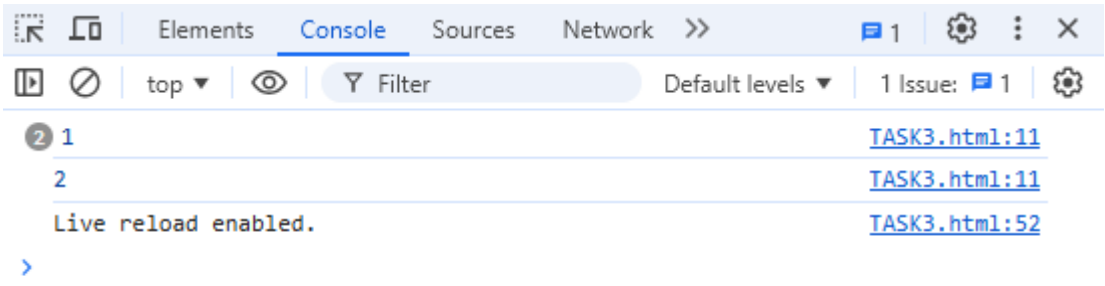
OUTPUT:



TASK 3:

```
<html>
   <body>
   <script>
      function createCounter() {
   let count = 0;
   return {
      increment: function() {
         count++;
      },
      getCount: function() {
         console.log(count);
      }
   };
}
const counter1 = createCounter();
const counter2 = createCounter();
counter1.increment();
counter1.getCount();
counter2.increment();
counter2.getCount();
counter1.increment();
counter1.getCount();
   </script>
   </body>
</html>
```

OUTPUT:

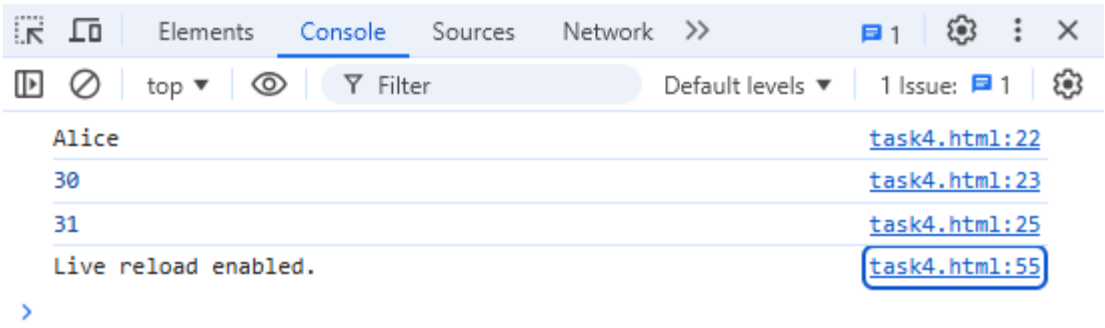


TASK 4:

```
<html>

  <body>

    <script>

    function createPerson(name, age) {

    let _name = name;

    let _age = age;

    return {

     getName: function() {

       return _name;

     },

     getAge: function() {

       return _age;

     },

     setAge: function(newAge) {

       if (newAge > _age) {

          _age = newAge;

       }

     }

    };

   }
```

```
const person = createPerson('Alice', 30);

console.log(person.getName());

console.log(person.getAge());

person.setAge(31);

console.log(person.getAge());
      </script>
   </body>
</html>
```

OUTPUT:

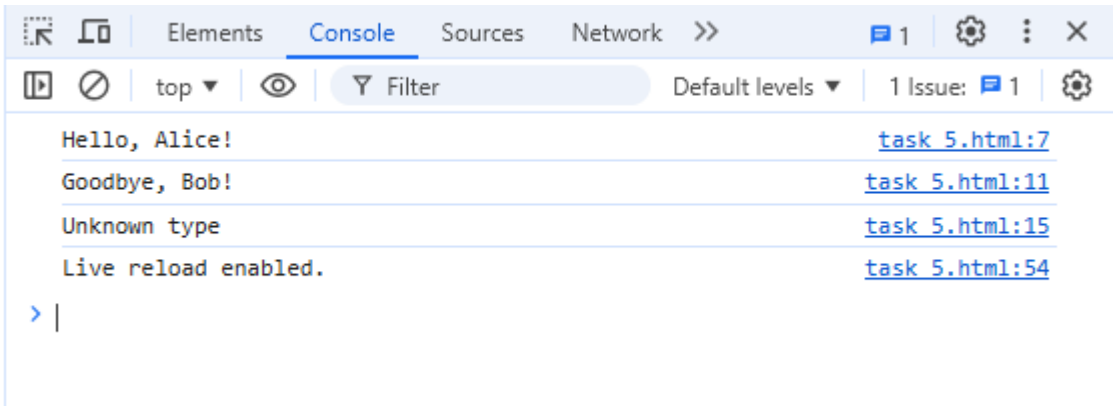


TASK 5:

```
<html>
   <body>
      <script>
      function functionFactory(type) {
      if (type === 'greet') {
        return function(name) {
          console.log(`Hello, ${name}!`);
        };
      } else if (type === 'farewell') {
        return function(name) {
          console.log(`Goodbye, ${name}!`);
        };
```

```
    } else {
      return function() {
        console.log('Unknown type');
      };
    }
  }
const greetFunction = functionFactory('greet');
greetFunction('Alice');
const farewellFunction = functionFactory('farewell');
farewellFunction('Bob');
const unknownFunction = functionFactory('unknown');
unknownFunction();
    </script>
  </body>
</html>
```

OUTPUT:



6.MODULES,INTRODUCTION IMPORT AND EXPORT
TASK-1

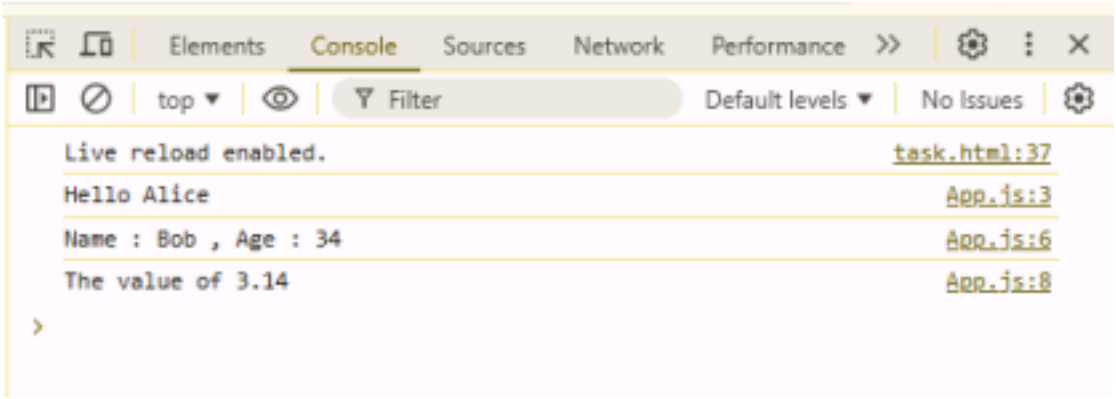
```
<!DOCTYPE html>
<html>
 <head>
 <title>Module Example</title>
 </head>
 <body>
 <script type="module" src = "App.js">
 </script>
 </body>
</html>
```

```
export function greet(name)
{
 return `Hello ${name}`;
}
export class Person {
 constructor(name,age){
 this.name = name;
 this.age = age;
 }
 introduce()
 {
 return `Name : ${this.name} , Age : ${this.age}`;
 }
}
export const pi = 3.14;
```

TASK-2
IMPORT FUNCTION:

```
import {greet,Person,pi} from "./myModule.js";

console.log(greet("Alice"));

const person1 = new Person("Bob","34");
console.log(person1.introduce());

console.log(`The value of ${pi}`);
```

OUTPUT:



TASK-3

```
<!DOCTYPE html>
<html>
 <head>
 <title>Module Example</title>
 </head>
 <body>
 <script type="module" src = "App.js">
 </script>
 </body>
</html>
```

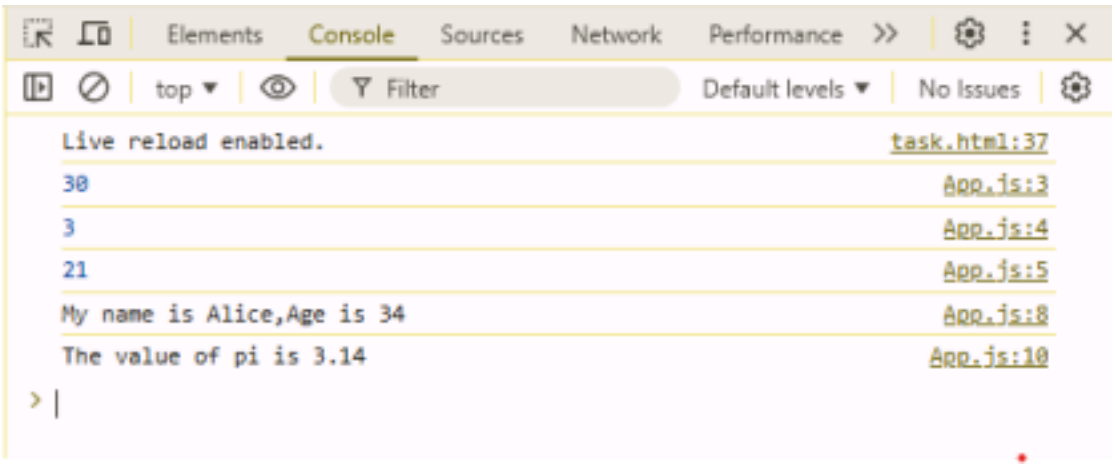
```
export function multiply(a,b)
{
 return a * b;
}
export function subtract(a,b)
{
 return a - b;
}
export function add(a,b,c)
{
 return a+b+c;
}
export class Person{
 constructor(name,age){
 this.name=name;
 this.age=age;
 }
 introduce()
 {
 return `My name is ${this.name},Age is ${this.age}`;
 }
```

```
}
export const pi = 3.14;
```

TASK-4
IMPORT FUNCTION:

```
import {multiply,subtract,add,Person,pi} from "./myModule.js";

console.log(multiply(5,6));
console.log(subtract(7,4));
console.log(add(4,8,9));

const person1 = new Person("Alice",34);
console.log(person1.introduce());

console.log(`The value of pi is ${pi}`);
```

OUTPUT:



TASK-5

```
<!DOCTYPE html>
<html>
 <head>
 <title>Module Example</title>
 </head>
 <body>
 <script type="module" src = "App.js">
 </script>
 </body>
</html>

export default function multiply(a,b)
{
 return a * b;
```

```
}
export function subtract(a,b)
{
 return a - b;
}
export function add(a,b,c)
{
 return a+b+c;
}
export class Person{
 constructor(name,age){
 this.name=name;
 this.age=age;
 }
 introduce()
 {
 return `My name is ${this.name},Age is ${this.age}`;  }
}
export const pi = 3.14;

import multiply, {subtract ,add,Person,pi} from "./myModule.js";

console.log(multiply(5,6));
console.log(subtract(7,4));
console.log(add(4,8,9));

const person1 = new Person("Alice",34);
console.log(person1.introduce());

console.log(`The value of pi is ${pi}`);
```

OUTPUT: