Lab 5 Report

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Part 1: Starting Web Assembly

> https://github.com/WebAssembly/design/blob/main/Semantics.md
>
> https://www.wasm.com.cn/docs/text-format/

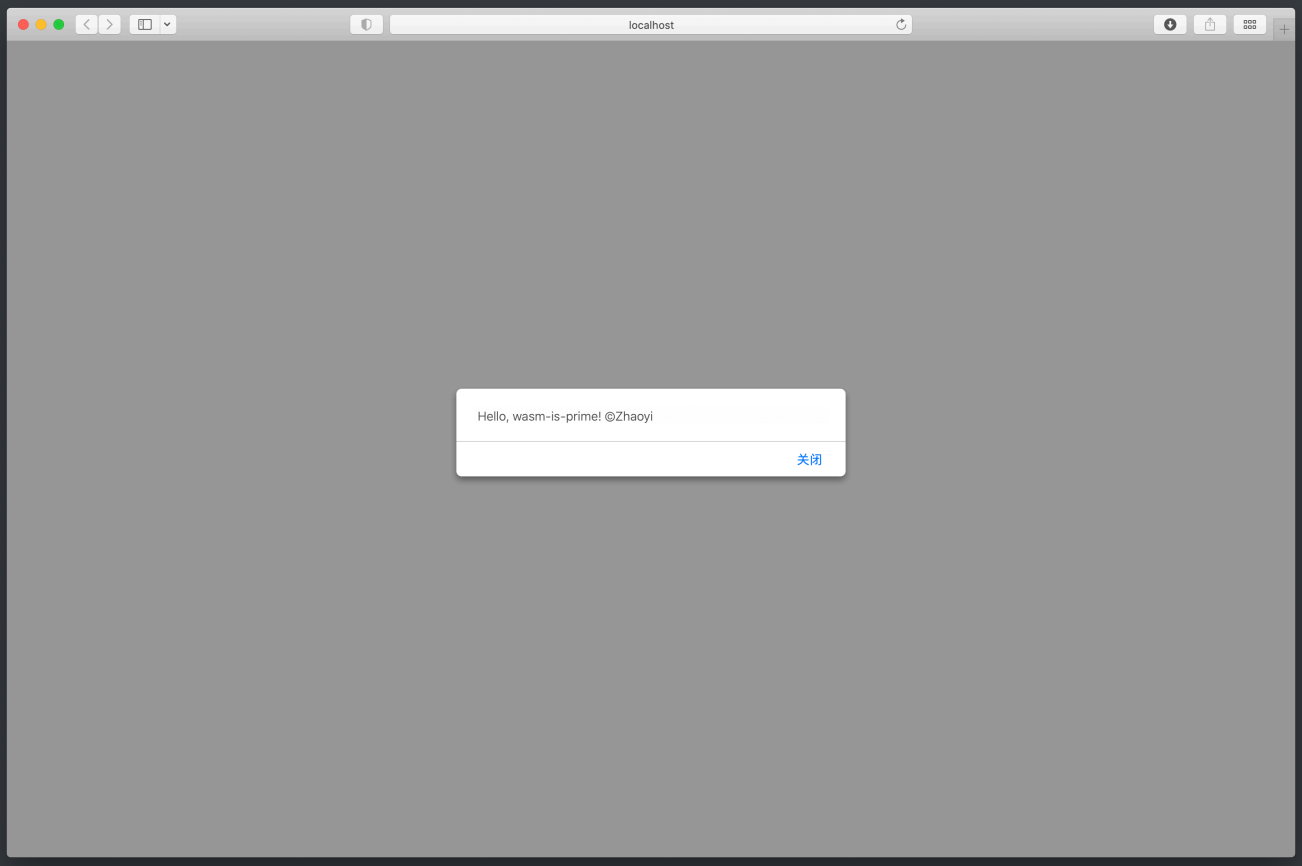
The answer is:

```
(module
 (func $RecursiveCount (param $A i32) (result i32)
      get_local $A
      i32.const 10
      i32.gt_s
  if (result i32)
      i32.const 0
  else
      get_local $A
      get_local $A
      i32.const 1
      i32.add
      call $RecursiveCount
      i32.add
  end)
 (export "RecursiveCount" (func $RecursiveCount)))
```

Code comments:

```
(module
 (func $RecursiveCount (param $A i32) (result i32)
      get local parameter $A
      set a constant value 10 <i32>
      compare the $A with 10, condition is "$A is bigger than 10 "
  if the condition is satisfied (result i32)
      return 0 <i32>
  else
      get local parameter $A (1st)
      get local parameter $A (2nd)
      set a constant value 1 <i32>
      Add 1 to 2nd $A
      call function RecursiveCount
      Add the result to 1st $A
  end)
 (export "RecursiveCount" (func $RecursiveCount)))
```

Part 2: Hello, World !



Part 3: Implementing is-prime app

In `wasm-is-prime/src/lib.rs`:

```
mod utils;

use wasm_bindgen::prelude::*;
use prime_tools::*;

// When the `wee_alloc` feature is enabled, use `wee_alloc` as the
global
// allocator.
#[cfg(feature = "wee_alloc")]
#[global_allocator]
static ALLOC: wee_alloc::WeeAlloc = wee_alloc::WeeAlloc::INIT;
```

```
#[wasm_bindgen]
extern {
    fn alert(s: &str);
}

#[wasm_bindgen]
pub fn greet() {
    alert("Hello, wasm-is-prime! ©Zhaoyi");
}

#[wasm_bindgen]
pub fn CheckPrime(s: &JsValue) {
    let mut input: String = s.as_string().unwrap();
    if is_prime(input) {
        alert("Input is Prime");
    } else {
        alert("Input is NOT Prime");
    }
}
pub fn is_prime(s: String) -> bool {
    let input: u32 = s.trim().parse().expect("Cannot parse");
    is_u32_prime(input)
}
```

In `wasm-is-prime/www/index.html`:

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="utf-8">
    <title>Is-Prime APP!</title>
</head>
<body>
    <noscript>This page contains webassembly and javascript content,
please enable javascript in your browser.</noscript>
```

```
        <script src="./bootstrap.js"></script>
        <form>
            Enter a number: <input type="text" value="2" id="PrimeNumber">
    <br>
        </form>
        <button id="CheckNumber">Check Number</button>
    </body>
    </html>
```

In `wasm-is-prime/www/index.js`:

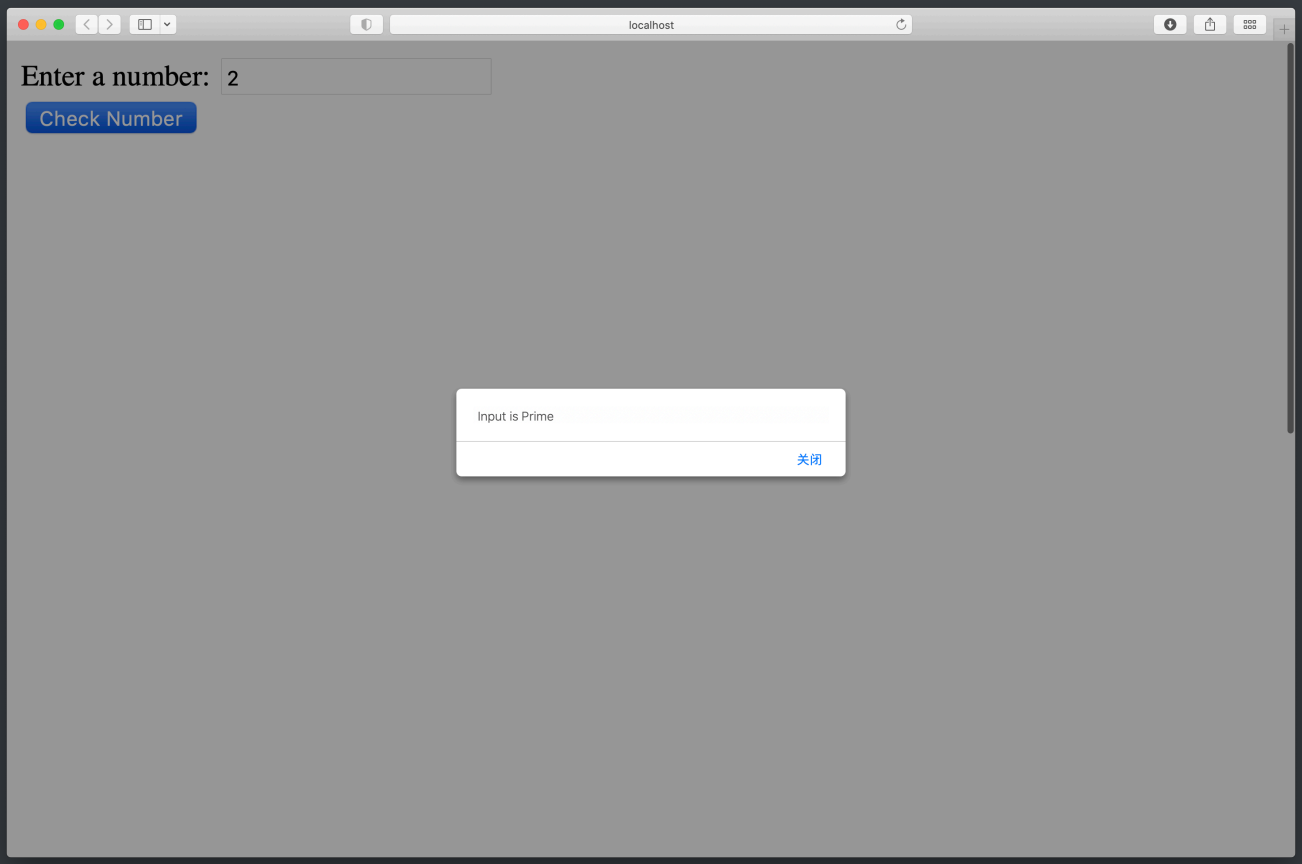
```
    import * as wasm from "wasm-is-prime";

    // wasm.greet();
    const textbox1 = document.getElementById("PrimeNumber");
    document.getElementById("CheckNumber").addEventListener("click", event
    => {
        wasm.CheckPrime(textbox1.value);
    });
```

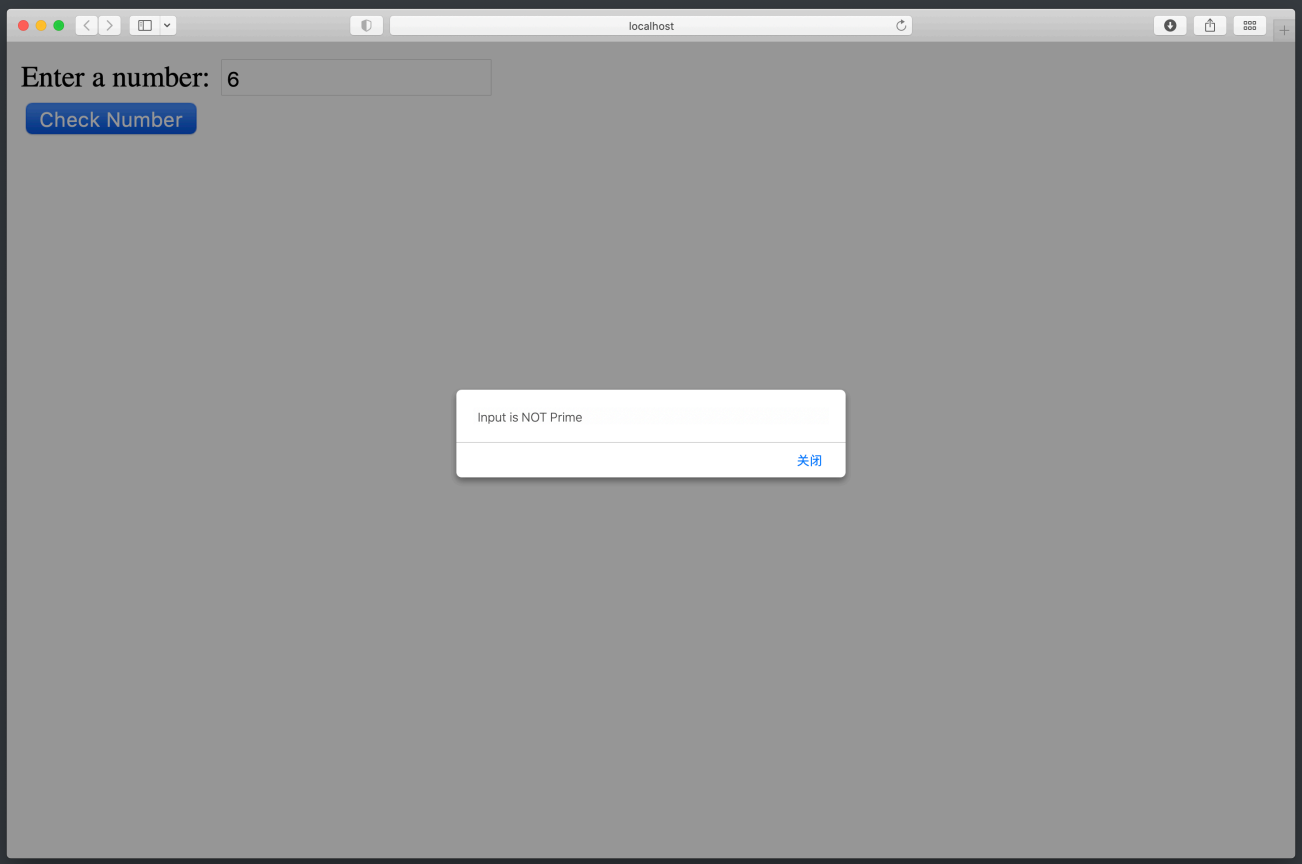
In `wasm-is-prime/pkg/wasm-is-prime.d.ts`:

```
    export function greet(): void;
    export function CheckPrime(s: any): void;  // ADD this line
```

Now, we run `wasm-pack build` under root path `/wasm-is-prime`, and then run `npm run start` under path `wasm-is-prime/www/`.

The output


localhost
Enter a number: 2
Check Number
Input is Prime
关闭


localhost
Enter a number: 6
Check Number
Input is NOT Prime
关闭