Day 1: Let and Const

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Variable Declaration Keywords

`var`

We use the *var* keyword to declare variables. The scope of a variable declared using this keyword is within the context wherever it was declared. For variables declared outside any

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- EXAMPLE

```
"use strict"
process.stdin.on('data', function (data) {
    main(+(data));
});
/**** Ignore above this line. ****/

function main(input) {
    var a = input;

    // If 'a' is odd:
    if (a % 2 == 1) {
        var a = input + 1;
        console.log("if(a): " + a);
    }

    console.log("main(a): " + a);
}
```

Input

```
11
```

Run

Output

OK

Solution

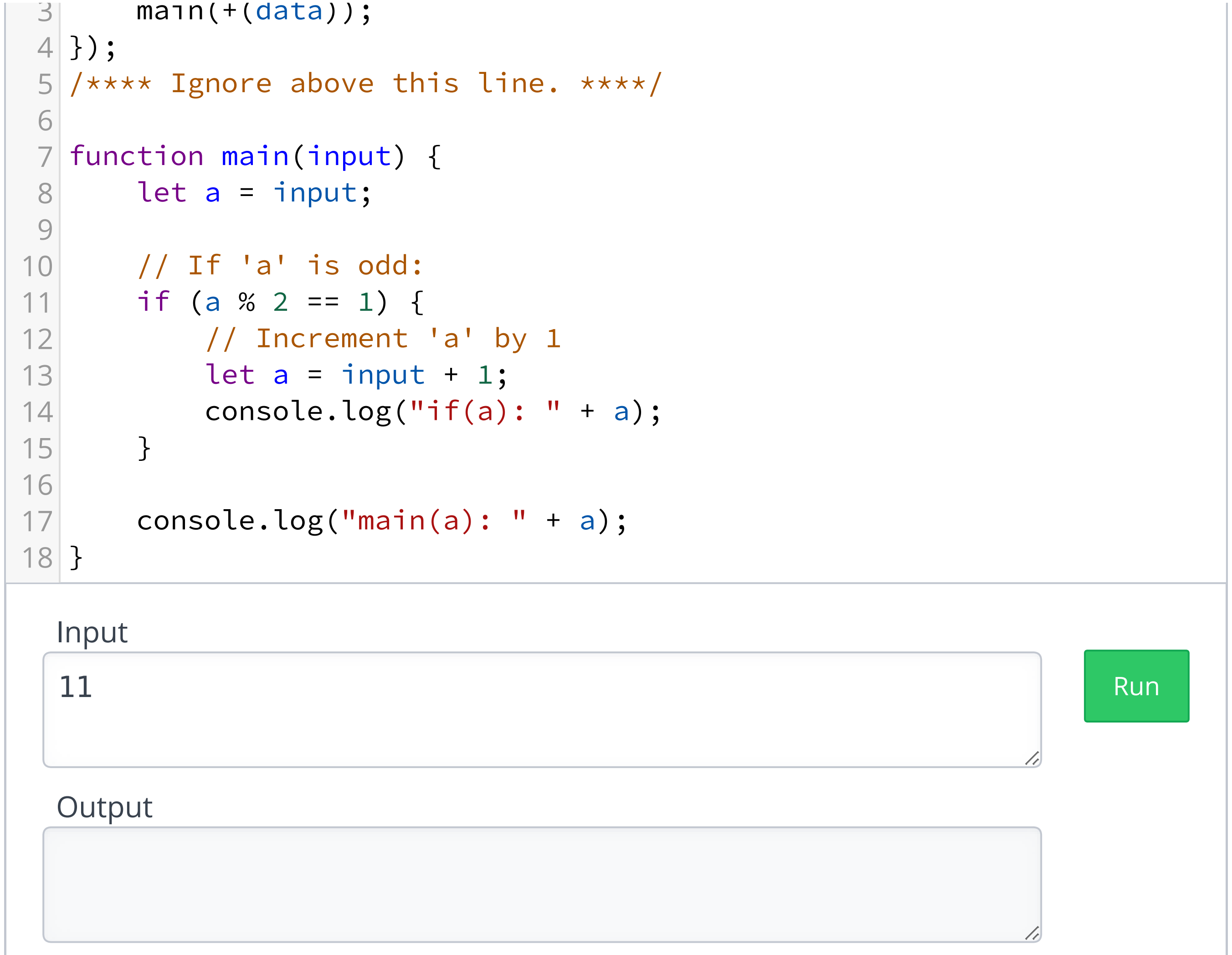
Click *Run* above to execute the given code. It works in the following way:

1. Variable a is declared in the *main* function using the *var* keyword and initialized with the given value, 11.
2. $a \% 1$ evaluates to *true* because $a = 11$ is odd, so we enter the *if* block.
3. Variable a is declared a second time inside the *if* block (still using the *var* keyword) and initialized with a value of $11 + 1 = 12$. We print the value of $a = 12$.
4. We exit the *if* block and print the value of a in *main*. This value is 12 because the scope of the initial declaration of a in *main* includes the *if* block.

`let`

We use the *let* keyword to declare variables that are limited in scope to the block, statement, or expression in which they are used. This is unlike the *var* keyword, which defines a variable globally or locally to an entire function regardless of block scope.

- EXAMPLE



```
    main(+(data));
});
/**** Ignore above this line. ****/

function main(input) {
    let a = input;

    // If 'a' is odd:
    if (a % 2 == 1) {
        // Increment 'a' by 1
        let a = input + 1;
        console.log("if(a): " + a);
    }

    console.log("main(a): " + a);
}
```

Input

```
11
```

Output

Solution

1. Variable a is declared in the *main* function using the *let* keyword and initialized with the given value, 11.

2. $a \ \% \ 1$ evaluates to *true* because $a = 11$ is odd, so we enter the *if* block.

3. Variable a is declared a second time inside the *if* block (again using the *let* keyword) and initialized with a value of $11 + 1 = 12$. We print the value of $a = 12$.

4. We exit the *if* block and print the value of a in *main*. Because we used the *let* keyword for both declarations and the scope of the second declaration of a was limited to the *if* block, the value of a in *main* is still 11.

It's important to note that you cannot redeclare a variable declared using the *let* keyword within the same scope as the original variable. An attempt to do this raises an *Error*, as demonstrated by the code below.

```
"use strict"
process.stdin.on('data', function (data) {
    main(+(data));
});
/**** Ignore above this line. ****/

function main(input) {
    let a = input;

    // This will throw "SyntaxError: Identifier 'a' has already been
    console.log(a);
}
```

Input

```
11
```

Run

Output

`const`

We use the *const* keyword to create a *read-only* reference to a value, meaning the value referenced by this variable cannot be reassigned. Because the value referenced by a constant variable cannot be reassigned, JavaScript *requires* that constant variables always be initialized.

- EXAMPLE

Click *Run* below to see what happens when you declare a constant variable without initializing it.

```javascript
    main(+(data));
});
/**** Ignore above this line. ****/

function main(input) {
    const a = input;

    // This will throw "SyntaxError: Missing initializer in const de
    const b;

    console.log(a);
}
```

Input

```
11
```

Run

Output