



EXERCISES

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INTRODUCTION

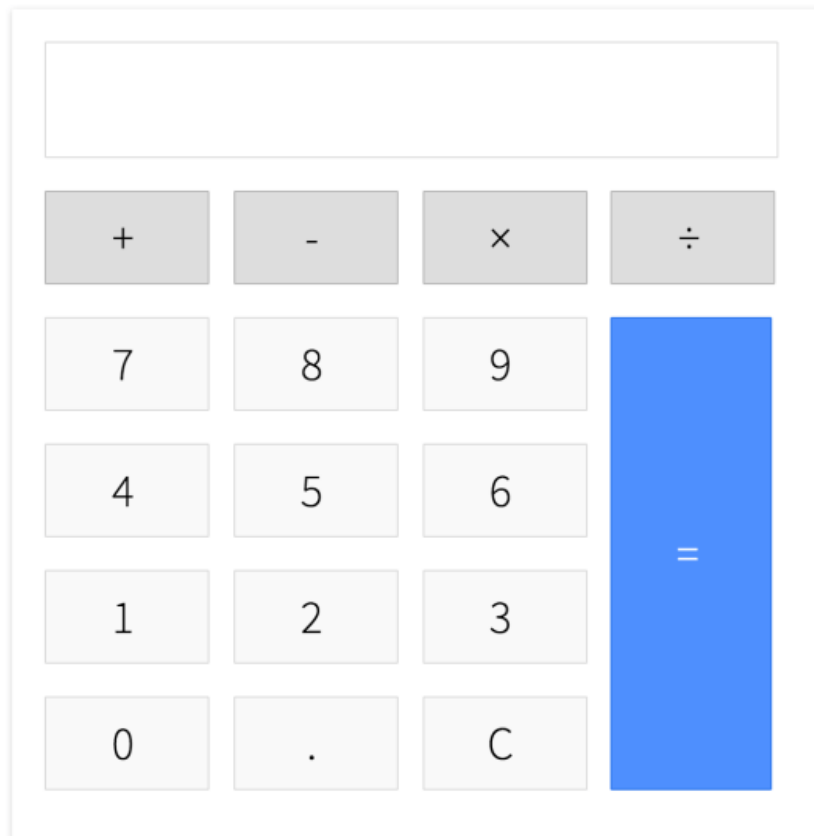
I'm a believer in learning by doing. Programming exercises are a useful tool to practice and improve your coding skills. After all, practice makes one, if not perfect, at least pretty darn good. One of the best ways to learn, practice, and enhance your skills with this code editor is through basic exercises and practice projects. These will allow you to understand the language better.

Learning to program means learning how to solve problems using code. Conceptually it is not very difficult to write a program that solves a problem that you can solve yourself. The skill you need to acquire is thinking very precisely about how you solve the problem and breaking it down into steps that are so simple that a computer can execute them. I encourage you to first solve a few instances of a problem by hand and think about what you did to find the solution. For example, if the task is sorting lists, sort some short lists yourself. A reasonable method would be to find the smallest element, write it down and cross it out of the original list and repeat this process until you have sorted the whole list. Then you have to teach the computer 1) how to find the smallest element, 2) how to write it down, 3) how to cross it out, and wrap this in a loop. Then continue this task breakdown process until you're confident you know how to write the necessary program.

To make good progress in your programming task, you need to test your work as early and as thoroughly as possible. Everybody makes mistakes while programming and finding mistakes in programs consumes a very large part of a programmer's workday. Finding a problem in a small and easy piece of code is much simpler than trying to spot it in a large program. This is why you should try to test each sub-task you identified during your task breakdown by itself. Only after you're confident that each part works as you expect you can attempt to plug them together. Make sure you test the complete program as well, errors can creep in the way the different parts interact. You should try to automate your tests. The easier it is to test your program, the freer you are in experimenting with changes.

Hope, these exercises help you to improve your coding skills.

CALCULATOR EXERCISE



Coding a good old calculator is excellent practice for your JavaScript skills. Create a clean interface with HTML and CSS and then add different features with JavaScript.

Start with just a few basic operators and buttons for:

- Additions
- Subtractions
- Multiplications

HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Calculator | Exercise</title>
  <link rel="stylesheet" href="style.css">
</head>
<body>
  <div class="calculator">
    <div class="input" id="input"></div>
    <div class="buttons">
      <div class="operators">
        <div>+</div>
        <div>-</div>
        <div>&times;</div>
        <div>&divide;</div>
      </div>
      <div class="leftPanel">
        <div class="numbers">
          <div>7</div>
          <div>8</div>
          <div>9</div>
        </div>
        <div class="numbers">
          <div>4</div>
          <div>5</div>
          <div>6</div>
        </div>
        <div class="numbers">
          <div>1</div>
          <div>2</div>
          <div>3</div>
        </div>
        <div class="numbers">
          <div>0</div>
          <div>.</div>
          <div id="clear">C</div>
        </div>
      </div>
      <div class="equal" id="result">=</div>
    </div>
  </div>

  <script src="main.js"></script>
</body>
</html>
```

CSS

```
body {
  width: 500px;
  margin: 4% auto;
  font-family: 'Source Sans Pro', sans-serif;
  letter-spacing: 5px;
  font-size: 1.8rem;
  -moz-user-select: none;
  -webkit-user-select: none;
  -ms-user-select: none;
}

.calculator {
  padding: 20px;
  -webkit-box-shadow: 0px 1px 4px 0px rgba(0, 0, 0, 0.2);
  box-shadow: 0px 1px 4px 0px rgba(0, 0, 0, 0.2);
  border-radius: 1px;
}

.input {
  border: 1px solid #ddd;
  border-radius: 1px;
  height: 60px;
  padding-right: 15px;
  padding-top: 10px;
  text-align: right;
  margin-right: 6px;
  font-size: 2.5rem;
  overflow-x: auto;
  transition: all .2s ease-in-out;
}

.input:hover {
  border: 1px solid #bbb;
  -webkit-box-shadow: inset 0px 1px 4px 0px rgba(0, 0, 0, 0.2);
  box-shadow: inset 0px 1px 4px 0px rgba(0, 0, 0, 0.2);
}

.operators div {
  display: inline-block;
  border: 1px solid #bbb;
  border-radius: 1px;
}
```

```
width: 78px;
text-align: center;
padding: 10px;
margin: 20px 4px 10px 0;
cursor: pointer;
background-color: #ddd;
transition: border-color .2s ease-in-out, background-color .2s, box-shadow .2s;
}

.operators div:hover {
  background-color: #ddd;
  -webkit-box-shadow: 0px 1px 4px 0px rgba(0, 0, 0, 0.2);
  box-shadow: 0px 1px 4px 0px rgba(0, 0, 0, 0.2);
  border-color: #aaa;
}

.operators div:active {
  font-weight: bold;
}

.leftPanel {
  display: inline-block;
}

.numbers div {
  display: inline-block;
  border: 1px solid #ddd;
  border-radius: 1px;
  width: 78px;
  text-align: center;
  padding: 10px;
  margin: 10px 4px 10px 0;
  cursor: pointer;
  background-color: #f9f9f9;
  transition: border-color .2s ease-in-out, background-color .2s, box-shadow .2s;
}

.numbers div:hover {
  background-color: #f1f1f1;
  -webkit-box-shadow: 0px 1px 4px 0px rgba(0, 0, 0, 0.2);
  box-shadow: 0px 1px 4px 0px rgba(0, 0, 0, 0.2);
  border-color: #bbb;
}
```

```
.numbers div:active {  
  font-weight: bold;  
}  
  
div.equal {  
  display: inline-block;  
  border: 1px solid #3079ED;  
  border-radius: 1px;  
  width: 17%;  
  text-align: center;  
  padding: 127px 10px;  
  margin: 10px 6px 10px 0;  
  vertical-align: top;  
  cursor: pointer;  
  color: #FFF;  
  background-color: #4d90fe;  
  transition: all .2s ease-in-out;  
}  
  
div.equal:hover {  
  background-color: #307CF9;  
  -webkit-box-shadow: 0px 1px 4px 0px rgba(0, 0, 0, 0.2);  
  box-shadow: 0px 1px 4px 0px rgba(0, 0, 0, 0.2);  
  border-color: #1857BB;  
}  
  
div.equal:active {  
  font-weight: bold;  
}
```


JAVASCRIPT