

## Chapter 5 - Digital Data\ASCII\ASCII\_string\_converter.html

```
1 <!DOCTYPE html>
2 <html>
3   <head>
4     <title>ASCII String Converter</title>
5     <style>
6       body {
7         padding: 15px 0;
8         text-align: center;
9         background: linear-gradient(90deg, rgb(2, 184, 17) 44%, rgb(0, 255, 255) 100%);
10        font-family: 'Trebuchet MS', 'Lucida Sans Unicode', 'Lucida Grande', 'Lucida Sans'
, Arial, sans-serif;
11        color: rgb(25, 0, 37)
12      }
13      div{
14        text-align: center;
15        font-family: Cambria, Cochin, Georgia, Times, 'Times New Roman', serif;
16        font-size: 150%;
17        background-color: #0077ff;
18        width: 75%;
19        border: 5px solid rgb(8, 0, 116);
20        padding: 25px;
21        margin: auto
22      }
23    </style>
24    <script>
25      // Image Citations: https://simple.wikipedia.org/wiki/ASCII
26
27      // Description: Converts a binary number to decimal
28      // Citation: baseConverter.html
29      // Input/Parameters: Binary number
30      // Output/Return: Converted decimal number
31      function binToDec(binaryNumber) {
32        // Split array into individual indices
33        let binaryArray = binaryNumber.split("");
34
35        // Reverse the array, store back in the same variable
36        binaryArray = binaryArray.reverse();
37
38        // Store our final answer (decimal)
39        let decimalAnswer = 0;
40
41        // Loop through each individual digit in the binary number
42        for (let i = 0; i < binaryArray.length; i++) {
43          // Grab the digit at index i, convert to a number
44          let digit = Number(binaryArray[i]);
45          // Multiplying the digit by its place value
46          let digitValue = digit * (2 ** i);
47          // Adding the digit value to the total
48          decimalAnswer += digitValue;
49        }
50        return decimalAnswer;
51      }
52      // Description: Converts a decimal number to binary
```

```
53 // Citation: baseConverter.html
54 // Input/Parameters: Decimal number
55 // Output/Return: Converted binary number
56 function decToBin(decimalNumber) {
57     let binaryAnswer = "";
58
59     // While loop that run until we get the value of 0
60     while (decimalNumber != 0) {
61         // Find the remainder after dividing by 2
62         let remainder = decimalNumber % 2;
63         // Add the remainder to the binaryAnswer
64         binaryAnswer += remainder;
65         // Use integer division to create a new decimalNumber
66         decimalNumber = Math.floor(decimalNumber / 2);
67     }
68     // Reverse our binaryAnswer
69     let binaryArray = binaryAnswer.split("");
70     binaryArray.reverse();
71     binaryAnswer = binaryArray.join("");
72
73     // Return the final binaryAnswer
74     return binaryAnswer;
75 }
76 // Description: Takes a string and converts it to the binary equivalent
77 // Citation: None
78 // Input/Parameters: String
79 // Output/Return: Binary equivalent
80 function convertToBinaryASCII(stringInput){
81     let stringArray = stringInput.split("");
82     let stringLength = stringArray.length;
83     let binaryOutput = ""
84     for (let i=0; i<stringLength; i++) {
85         let character = stringArray[i]
86         character = character.charCodeAt(0)
87         let binaryInteger = decToBin(character)
88         while (binaryInteger.length < 8){
89             binaryInteger = "0" + binaryInteger;
90         }
91         binaryOutput += binaryInteger + " "
92     }
93     return binaryOutput;
94 }
95 // Description: Takes a binary number and converts it to the string equivalent
96 // Citation: None
97 // Input/Parameters: Binary number
98 // Output/Return: String equivalent
99 function convertToString(binaryInput){
100     let binaryArray = binaryInput.split(" ");
101     let arrayLength = binaryArray.length;
102     let stringOutput = ""
103     for (let i=0; i<arrayLength; i++) {
104         let character = binaryArray[i]
105         character = binToDec(character)
106         character = String.fromCharCode(character)
107         stringOutput += character + " "
108     }
```

```
109         return stringOutput;
110     }
111     // Description: Displays the final converted value
112     // Citation: None
113     // Input/Parameters: None
114     // Output/Return: Final converted value
115     function displayResult(){
116         let inputValue = idInputValue.value
117         let selected = idSelectConversion.value
118         let output = "";
119         if (selected == "String to Binary") {
120             output = convertToBinaryASCII(inputValue)
121         }
122         else if (selected == "Binary to String") {
123             output = convertToString(inputValue)
124         }
125         idOutputValue.innerHTML = output;
126     }
127 </script>
128 </head>
129 <body>
130     <h1>ASCII Converter</h1>
131     <h2>Convert between binary and string representations of ASCII</h2>
132     
133     <br>
134     <textarea id="idInputValue" placeholder="Input goes here (ASCII expressed either as
binary string or decimal string)"rows="10" cols="50"></textarea>
135     <br>
136     <br>
137     <select id="idSelectConversion">
138         <option>String to Binary</option>
139         <option>Binary to String</option>
140     </select>
141     <br>
142     <br>
143     <input type="button" value="Display Result" onclick="displayResult()">
144     <br>
145     <br>
146     <div id="idOutputValue"></div>
147 </body>
148 </html>
```