Number System Conversion

A HTML and JavaScript based project

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HIGHLIGHTS

Styles

<Style>

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CSS is an amazing tool of HTML5 which enables programmers to make visually appealing changes to their code.
We have used CSS to stylize the web page and make it more visually appealing.
Using the keyframes rule of CSS, we have added fade in animation to the text.

JavaScript

JavaScript is a powerful front-end computer language which powers websites to do calculations as well as perform certain tasks which are not possible for the HTML language to do.

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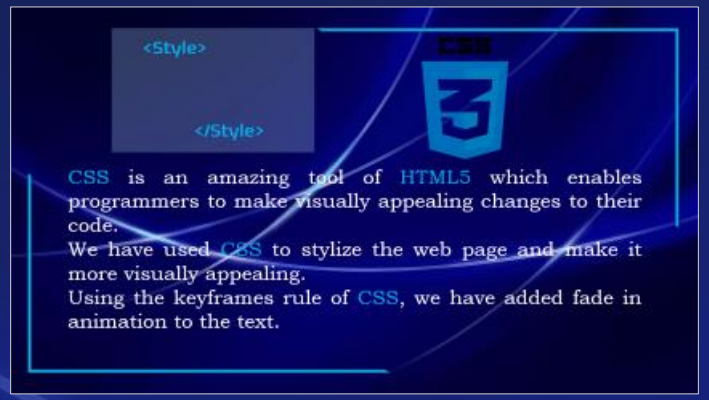
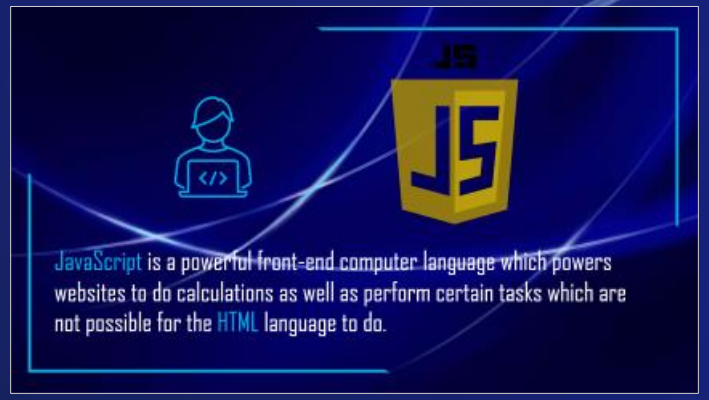


JavaScript



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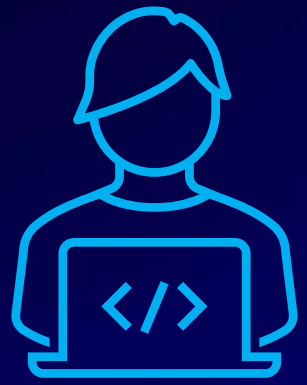

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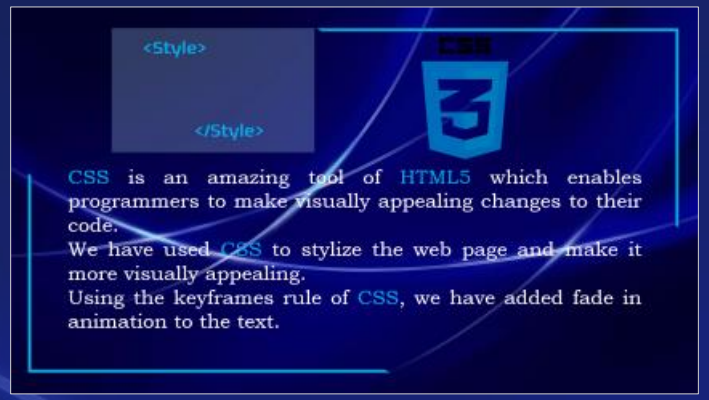

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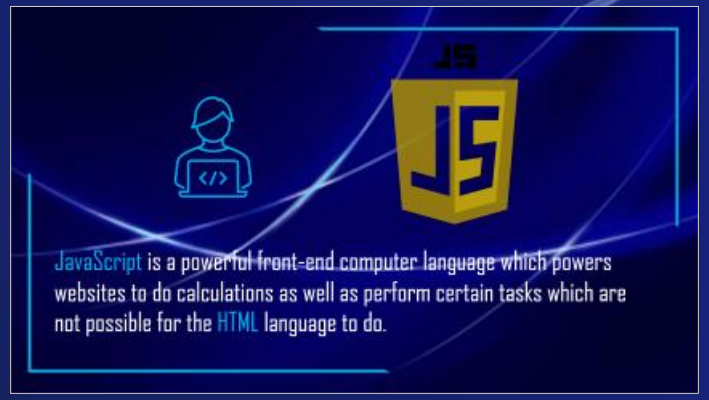

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Applications

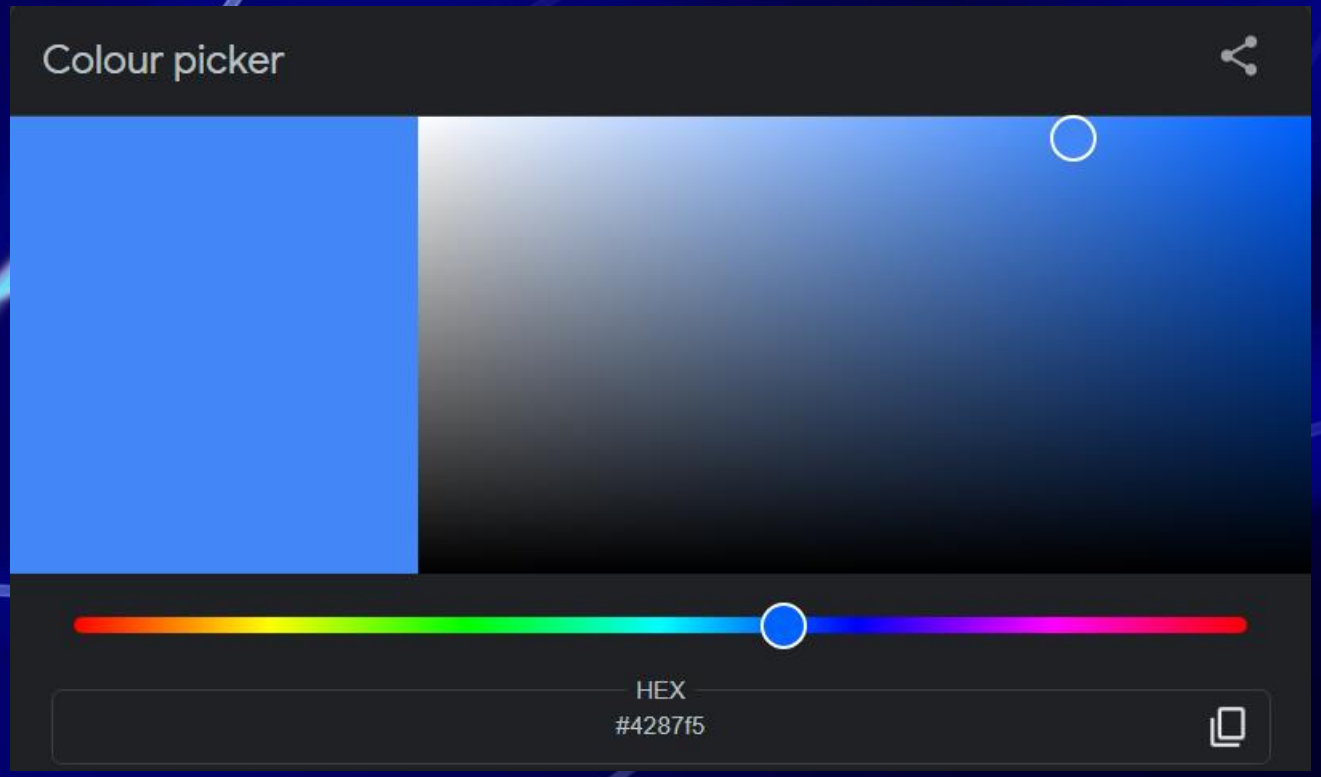
A number system converter is extremely useful in today's era of computers. Following are some of their real-life applications used in daily working

Networking

IP Addresses are stored in the form of dotted decimals but sometimes they may be needed in the form of binary or hexadecimal values. Same goes for MAC Addresses. This helps us in identifying a device over a network.

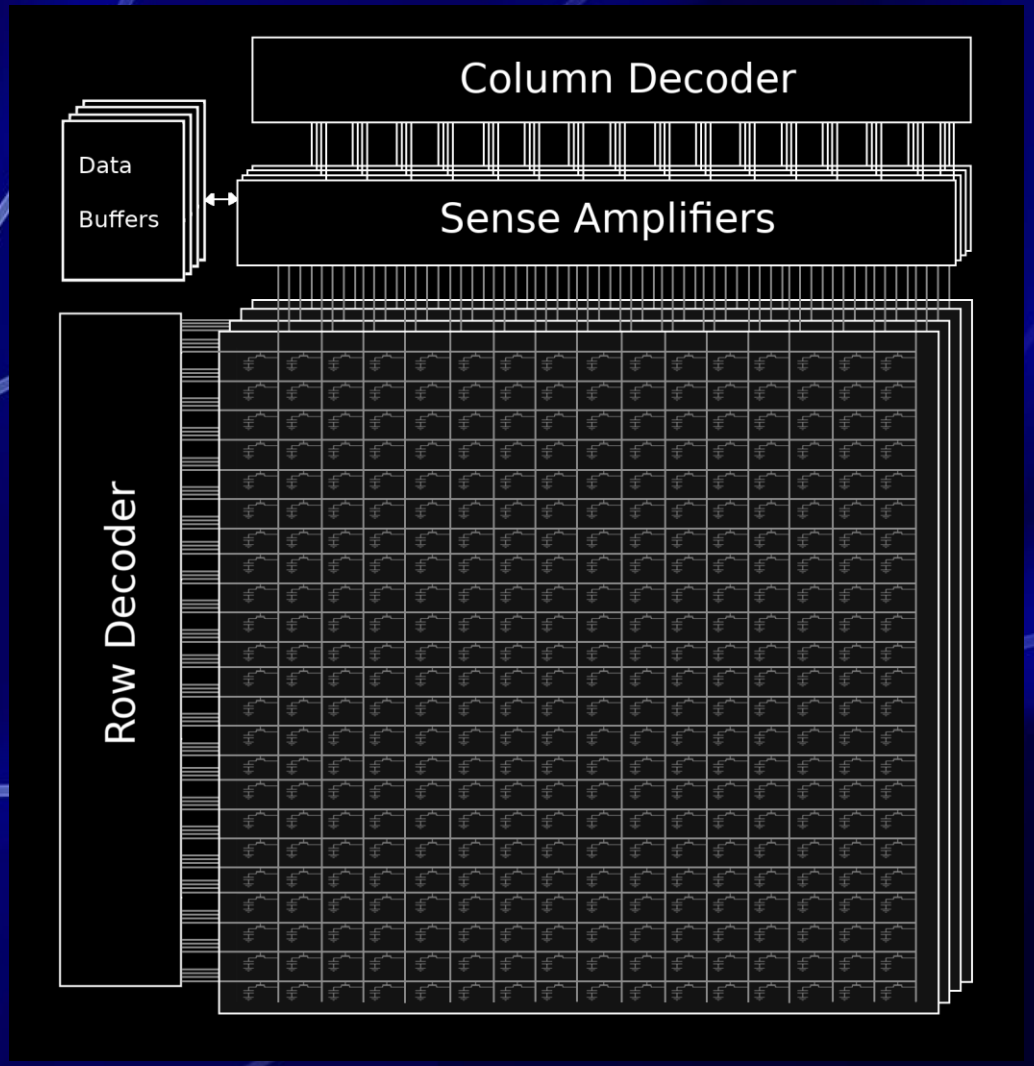
RGB Color Codes

Colors in digital graphics are often represented using RGB (Red, Green, Blue) values. Each color component is typically expressed in hexadecimal (e.g., #FF0000 for red). Number system converters are used to convert these hexadecimal color codes to binary or decimal values for certain computations.



Memory Address

Memory addresses in computer systems are often represented in hexadecimal. Programmers may need to convert these addresses to binary for certain debugging tasks or to decimal for better human understanding.

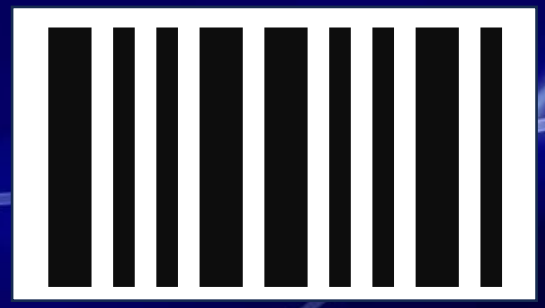


Confirmation

Converting number systems manually can be quite tedious but cross checking without automation can be difficult.

Barcode Encoding

Some barcode symbologies represent data using a combination of bars and spaces, where the width of each element is specified in binary. Converting these widths to decimal might be necessary for certain barcode-related calculations.



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How does it do that ?

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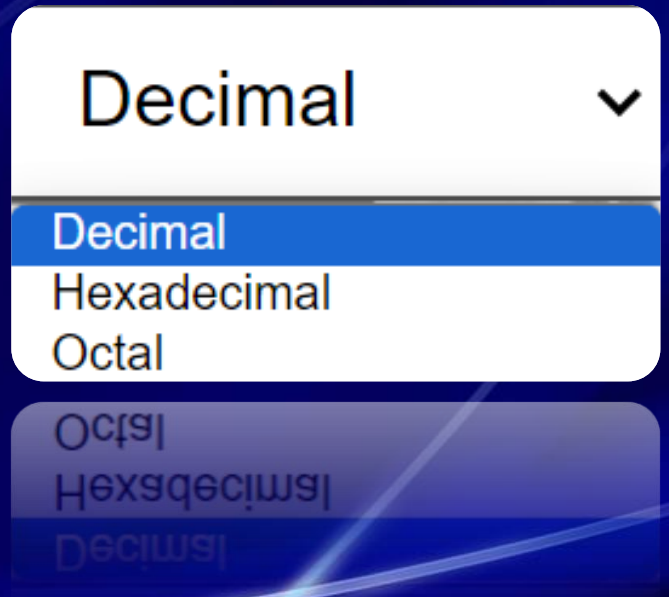
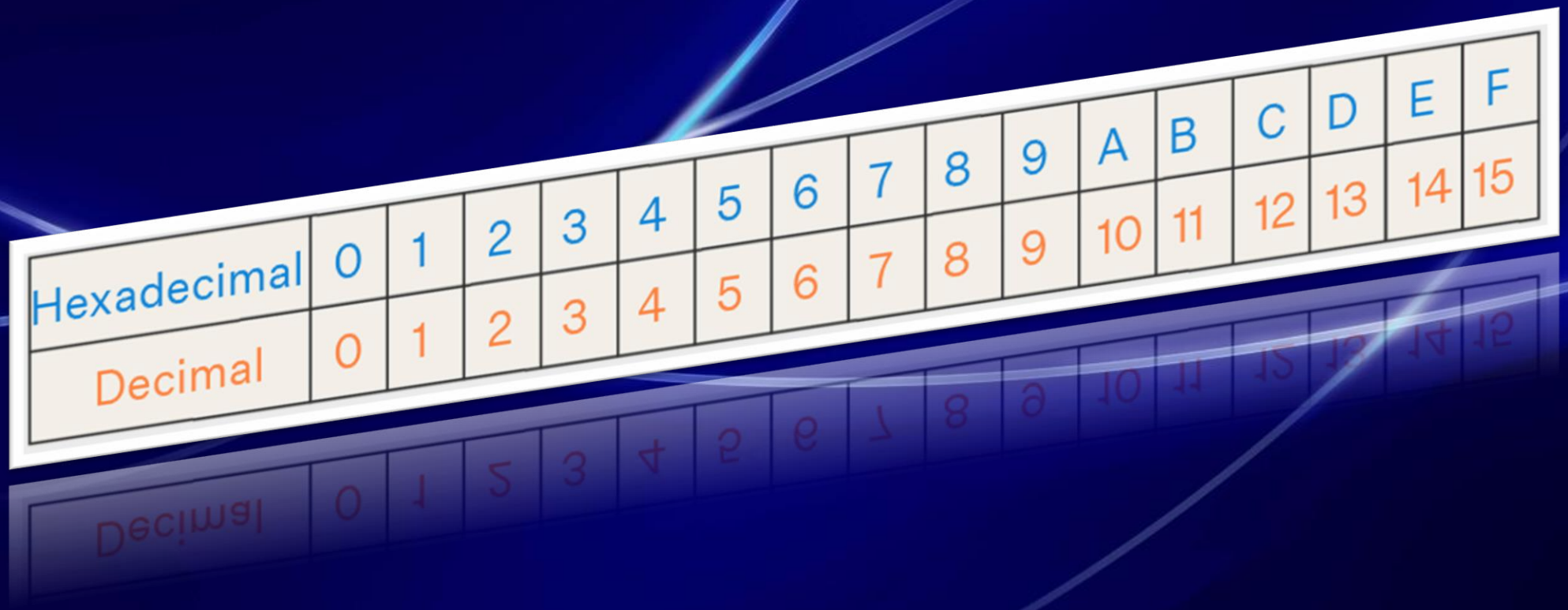
The JS code receives the input from the HTML in the form of a value. We have declared options for conversions which are selectable using the drop-down list. The select option is the sent to the switch case statement which the selects the statement block to be executed.

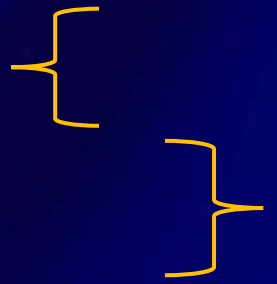


Use of parseInt() allows us to convert string to integer form along with the hexadecimal values from A to F since those cannot be included in calculation.



Hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Decimal	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Declaring multiple functions allowed us to keep the program clutter free and easily debug-able. It's not easy to debug a code if the systematic approach is not followed.



Entering an invalid input in the text box and proceeding for conversion results into 'NaN' output which signifies error.

How we made it work !

The Group consists of 3 members. We divide the jobs amongst each other for ease. At start, we tried using a backend language like C or Python but since that complicated the project, we settled down on JavaScript which makes it easy to make changes to from any device, anywhere.

The Code took us 2 weeks, probably 1-2 hours everyday to write because we kept on making changes to it. Using trial and error method isn't quite time efficient.

It is quite complicated to make a code for number system conversion since on paper and in code, the conversion method might be the same, but the approach is entirely different. Simple conversion on paper is complex in terms of code. To achieve this, we had to try other samples of code too. For example, we first used a for loop along with if statement to create this program to convert A-F to number equivalent.

```
var i, input, str, len, disp;
input =
document.getElementById("T1").value;
str = input.split("");
len = str.length;
for (i = 0; i < len; i++)
{
var val = str[i];
if (val == 'A') {
str[i] = '10';
} else if (val == 'B') {
str[i] = '11';
} else if (val == 'C') {
str[i] = '12';
} else if (val == 'D') {
str[i] = '13';
} else if (val == 'E') {
str[i] = '14';
} else if (val == 'F') {
str[i] = '15';
}
}
```

End

In the end, we created a website which is a functional converter. It can convert amongst Binary, Decimal, Hexadecimal and Octal Number systems.

The website is highly flexible and adjustable. The background style can be easily changed by simply changing a single URL.

A converter does not require any backend support and can keep up on its own thanks to JavaScript and allowed us to reduce the complexity of this project.

Since it's a web page, it can be linked to other websites easily and can be used freely!