



JAVASCRIPT WARS

by

Christopher Topalian

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Dedicated
to
God the Father



**TECHNOLOGY BEYOND
YOUR BELIEF STARK.**

**JavaScript is an incredibly
powerful language.**

**Mastering JavaScript is an
infinite superpower.**

This is the key to victory Stark.

Are you ready?

JavaScript Wars

by

Christopher Topalian

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Hey Tony.
Tony?

They're on
their Way!

JAVASCRIPT WARS

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We have only one year before the main ship arrives. When it does, it will be total war on the entire planet!

**We must prepare humanity.
We need an army of master programmers to design a drone response.**

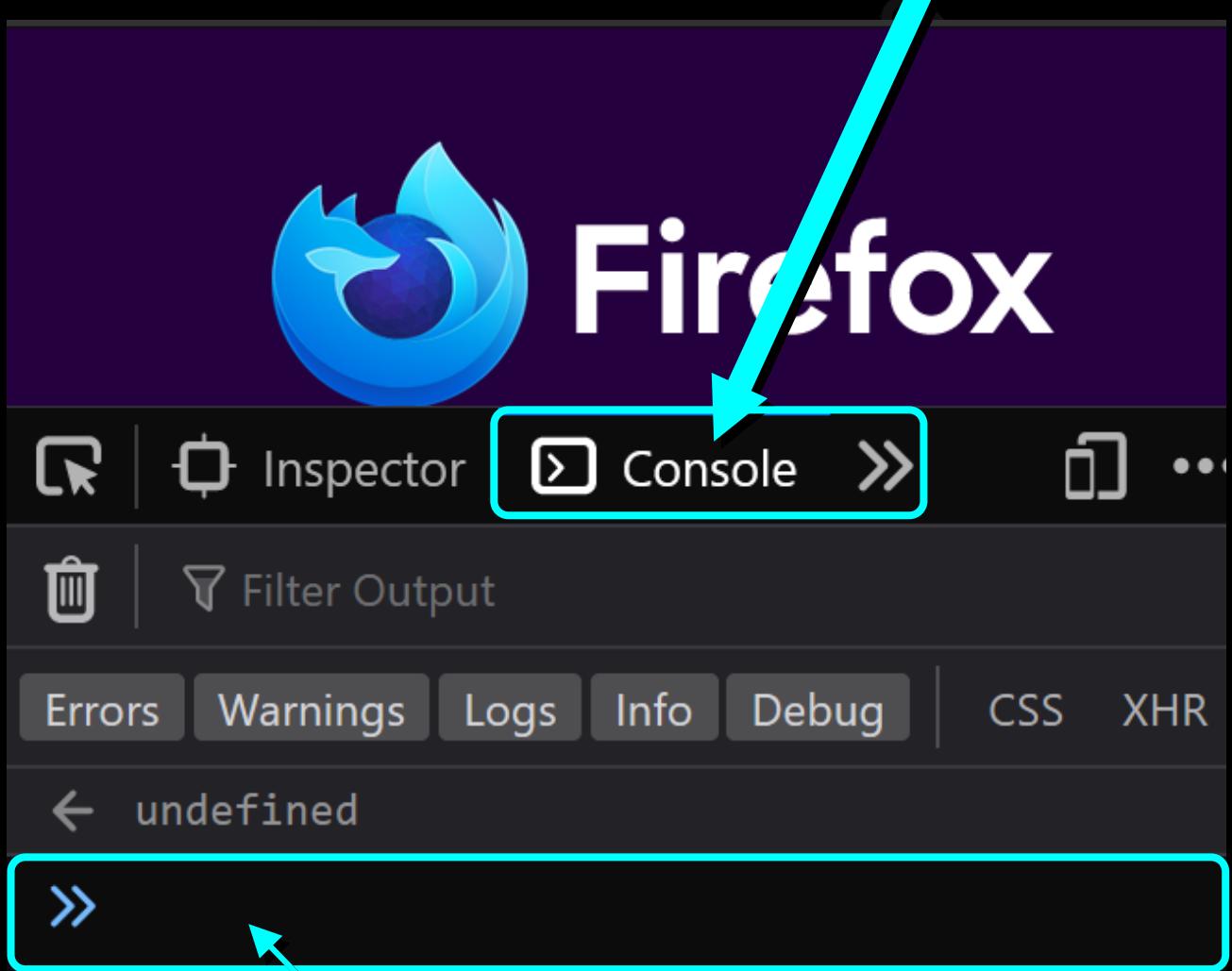
**Hey Tony.
Nice to see you too buddy.**

Where to Place Our Code

We Type or Paste our Code in the Console of the Web Browser

1. Open any Web Browser
2. Press F12

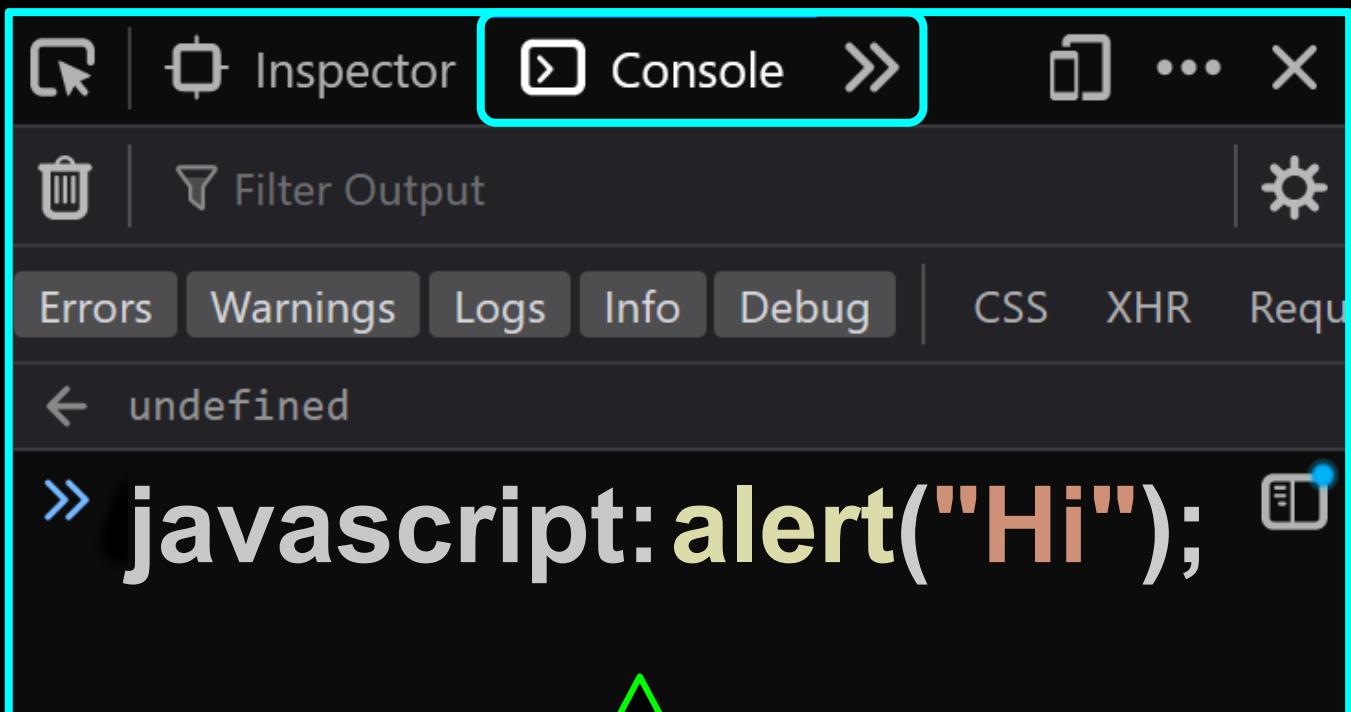
This opens our Web Browser CONSOLE



This is where we Type or Paste our Code

We Type the Code that we see on the next page into the **Console Code Area**.

Type the following Code in the Web Browser Console



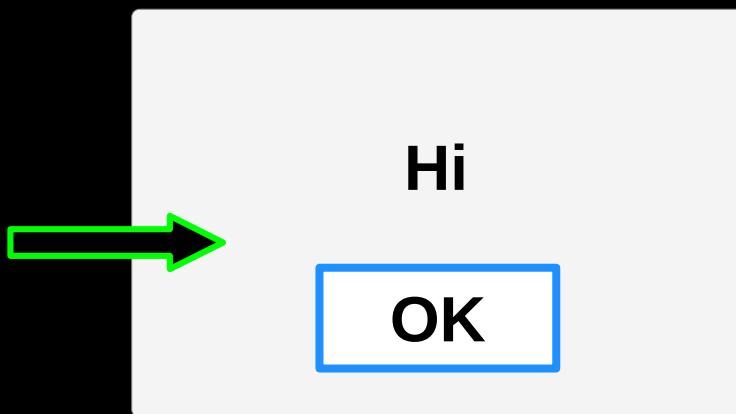
We Type this code in the
Web Browser Console

javascript: alert("Hi");

We then Press Enter button

A Message Box will appear,
as shown on the next page.

This is the Result of Our Code



This is an alert message box.

As we can see above, we typed our code and hit the enter button and it triggered an alert box to display the message Hi.

We can display any message that we want in the alert box.

We can also display variables, as shown in the next tutorial.

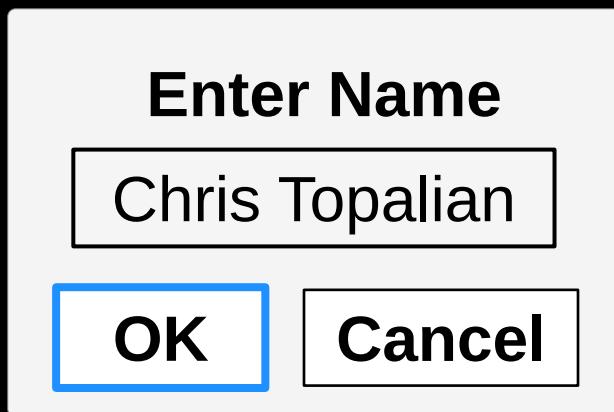
```
javascript:(  
/* Code in a Script Editor, Paste Code in Web  
Browser Console F12 */  
function()  
{  
    function askName()  
    {  
        let name = prompt("Enter Name");  
  
        return name;  
    }  
  
    alert("Hi " + askName());  
}  
/* Select All of the Code and  
press Ctrl + C to Copy it.
```

Open Web Browser Console with F12

**Paste the Code in the Browser Console using
Ctrl + V to Paste, then Press the Enter Button.**

**A Message Box will appear that says Hi and
the person's name that was entered. */**

This is the Result of Our Code

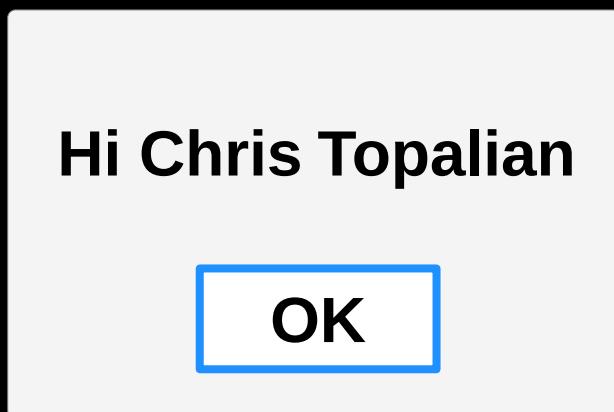


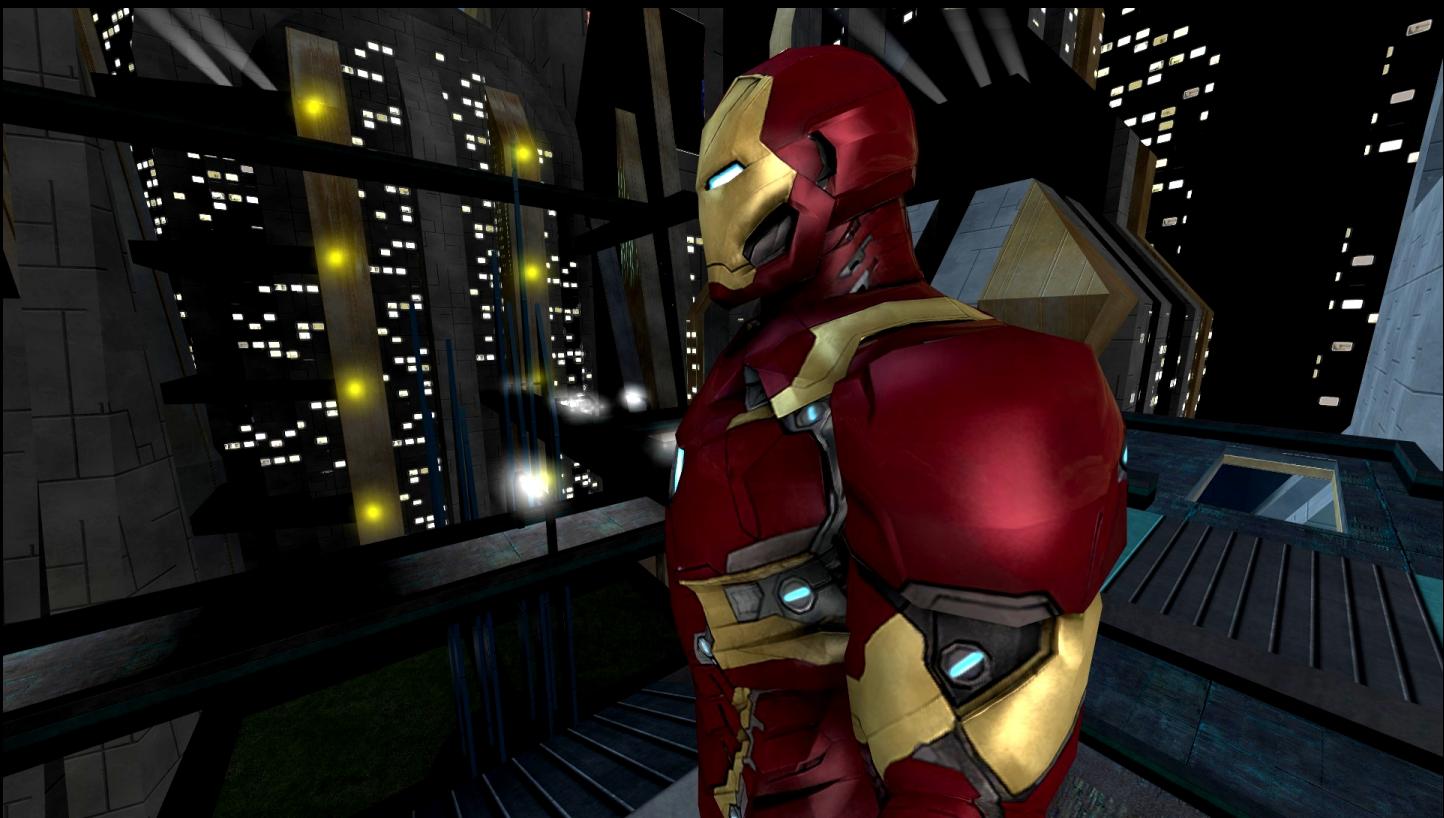
```
name = prompt("Enter Name");
```

The function named **prompt** is assigned to a variable that we call **name**.

The name variable is given a value when the person types their name in the text area of the **prompt box**.

When the person hits the **OK** button, it will greet them by name using an alert message box.





JAVASCRIPT...LOADING...
JARVIS SYSTEMS
ONLINE...READY...
ADVANCED INTELLIGENCE
SYSTEMS ACTIVATED.

Web Browser Console or Bookmarks?

Bookmarklets VS Web Browser Console to Activate our Code:

Activating Code in the Web Browser Console is very useful for quickly and easily testing code by Copying and Pasting from a Text File.

But, Activating Code in a Bookmarklet enables us to trigger the code with the click of the left mouse button, instead of having to copy and paste.

Either way is fine.

Either way, we have modified the Webpage!

Some people may find it easier to keep their code in text files and then paste their code in the Web Browser Console when needed, but other people might more enjoy activating their code using Bookmarks.

Let's learn how to trigger our code in the URL Field of a Bookmark. This is called a BOOKMARKLET, and we make it by placing our JavaScript code in the location field of a Bookmark that we create.

The next pages show step by step, how to put our JavaScript code in a Bookmark, but remember that we can keep using the Web Browser Console method too.

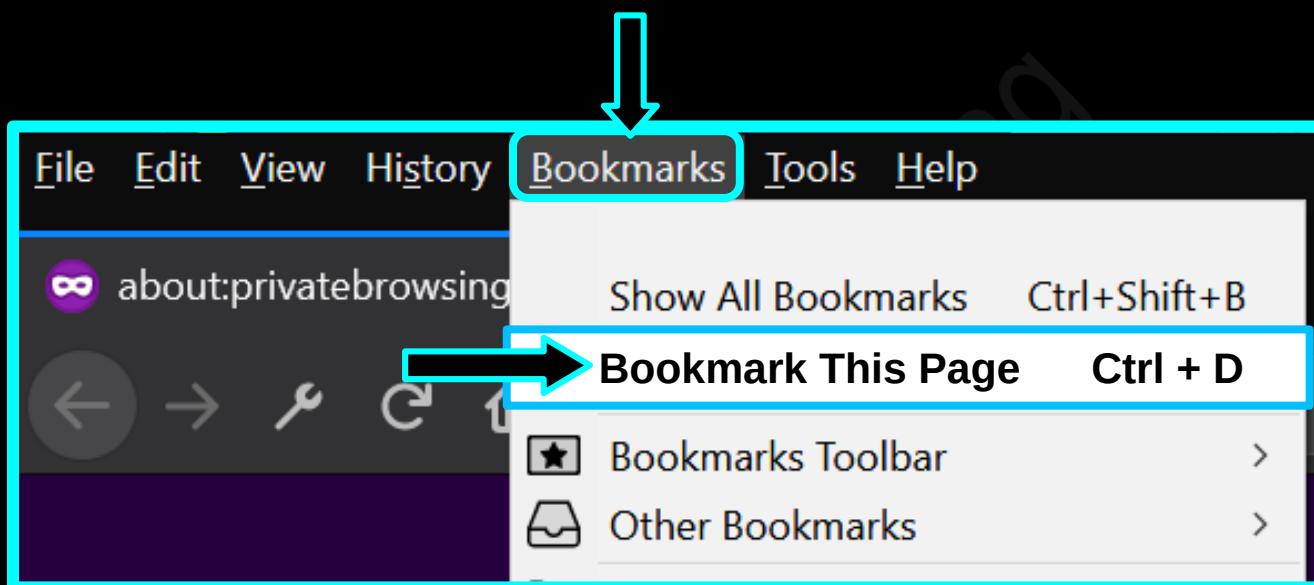
We usually make bookmarklets of scripts that we use very often.

But for just testing things it is often much easier to just paste our code from our script editor into the Browser Console and then hit the enter button to trigger the code.

How to Make Bookmarklets

We Start by Making a Bookmark, which will contain our JavaScript Code in the Location Field.

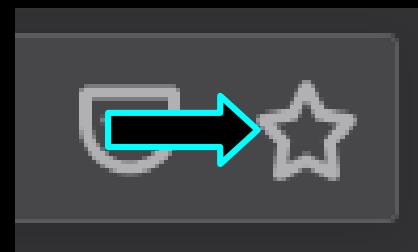
Left Click the Bookmarks Menu



Choose **Bookmark This Page**
or

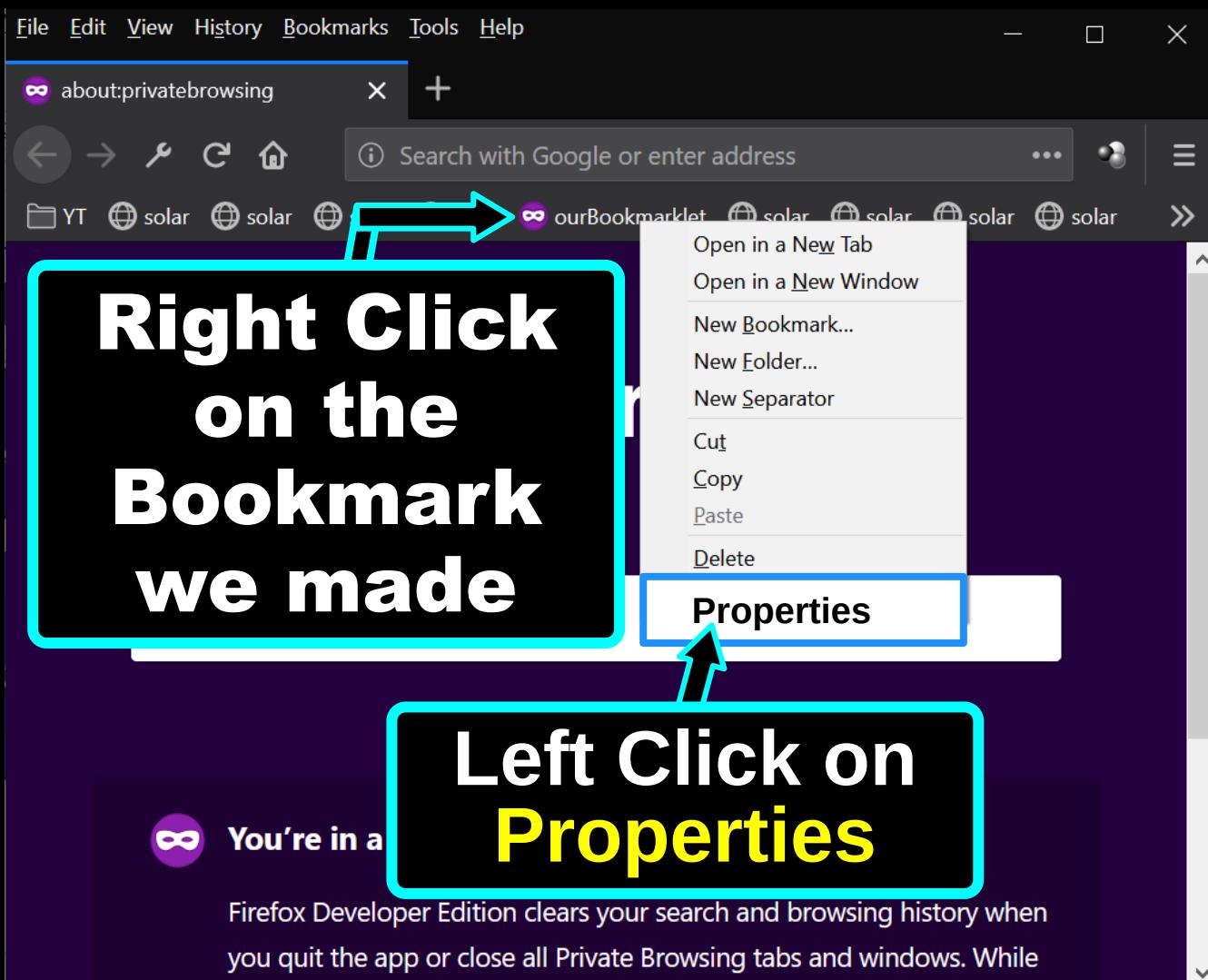
Left Click the **Star** icon
or

Shortcut is **Control + D**



**We should now have
a Bookmark created.**

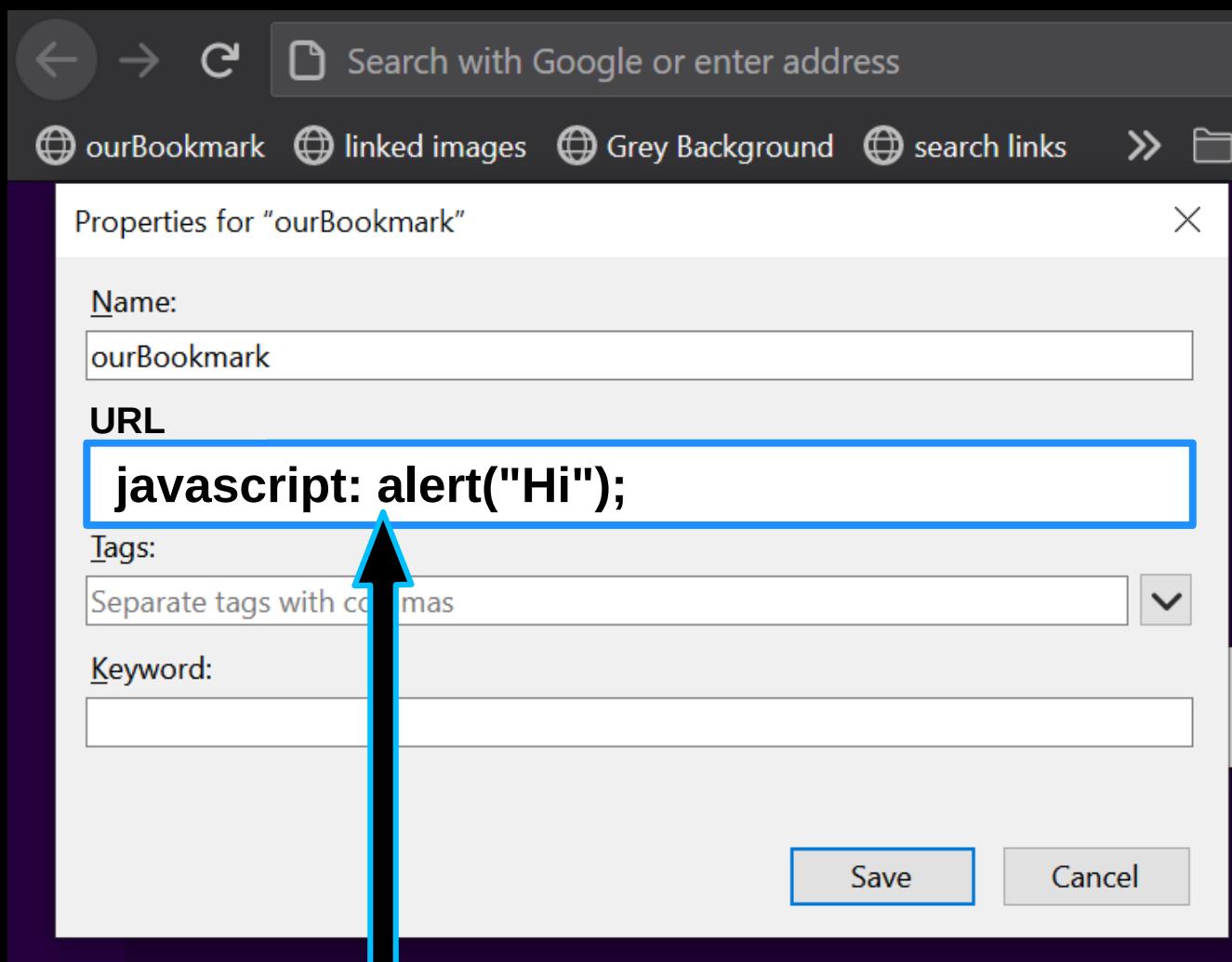
Edit Our Bookmark to Add Our JS



We open the Properties of our Bookmark to Edit it.

Once the Bookmark is open, we will see the Location Field, where we will place our JavaScript Code, as shown on the next tutorial page.

We Type Our JS Code in the URL Text Box of our Bookmark

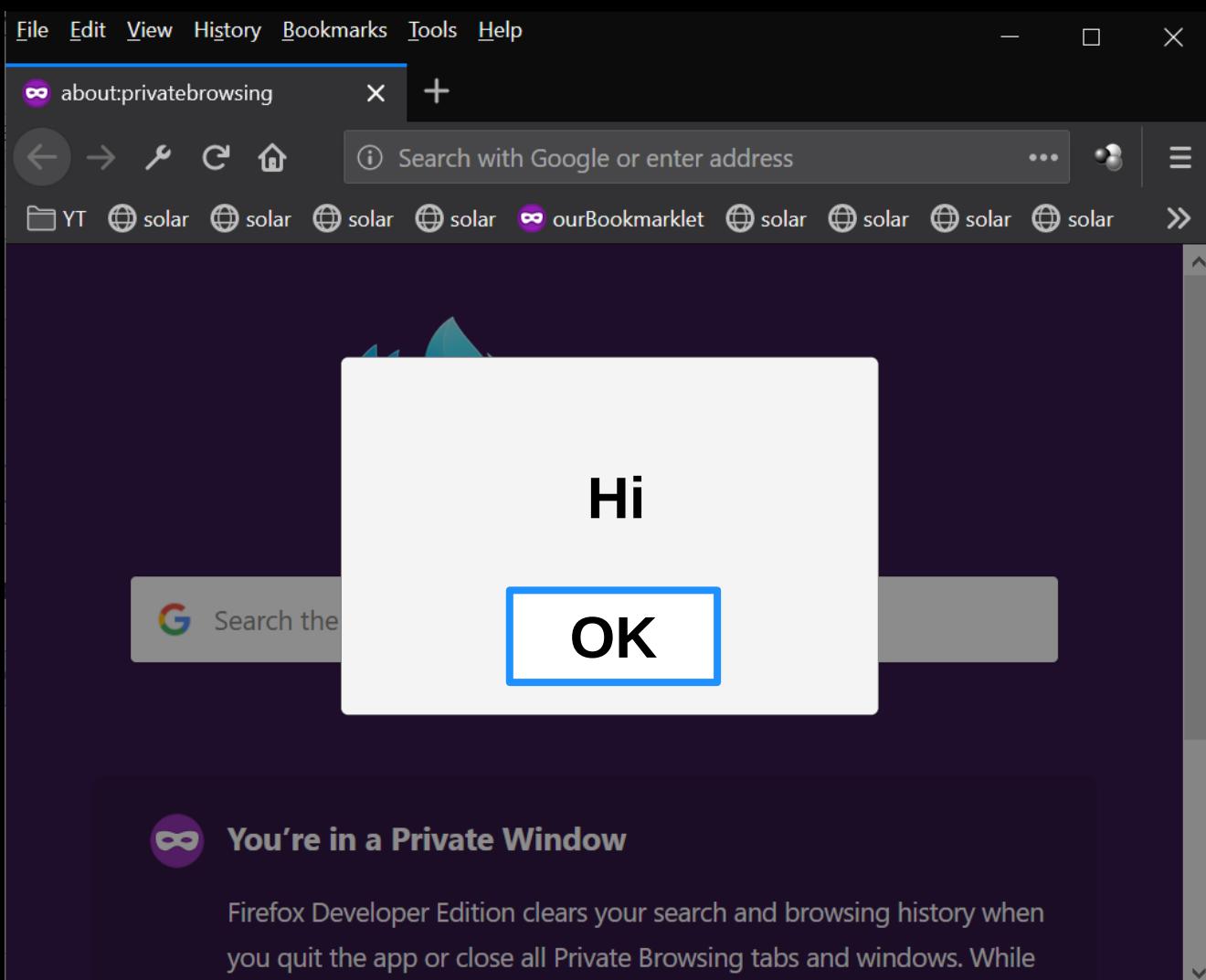


We Type this Code in the URL text box

javascript: alert("Hi");

then Press Save button

Activating Our Bookmarklet



We use our Bookmarklet by
Left Clicking on our Bookmark
on the Browser Toolbar.

This will activate an ALERT dialog box,
with the text message, Hi

Why do we make a Bookmark?

Our JavaScript code will be pasted in the URL field of a Bookmark. The bookmark contains our JavaScript code and makes triggering the code easy. Whenever we click on the bookmark, it will trigger our JavaScript code!

But, we don't do the typing of our code in the URL field of the bookmark, because it would be tough to edit on a one line URL field element.

So, instead, we do our coding work in a modern text editor, such as VSCode, and then we just copy our code from the script editor and paste it into the URL field of the Bookmark we create.

When we want to edit our Bookmarklet, we change the code in our Script editor and then paste it again into the URL field of our Bookmark and save it again.

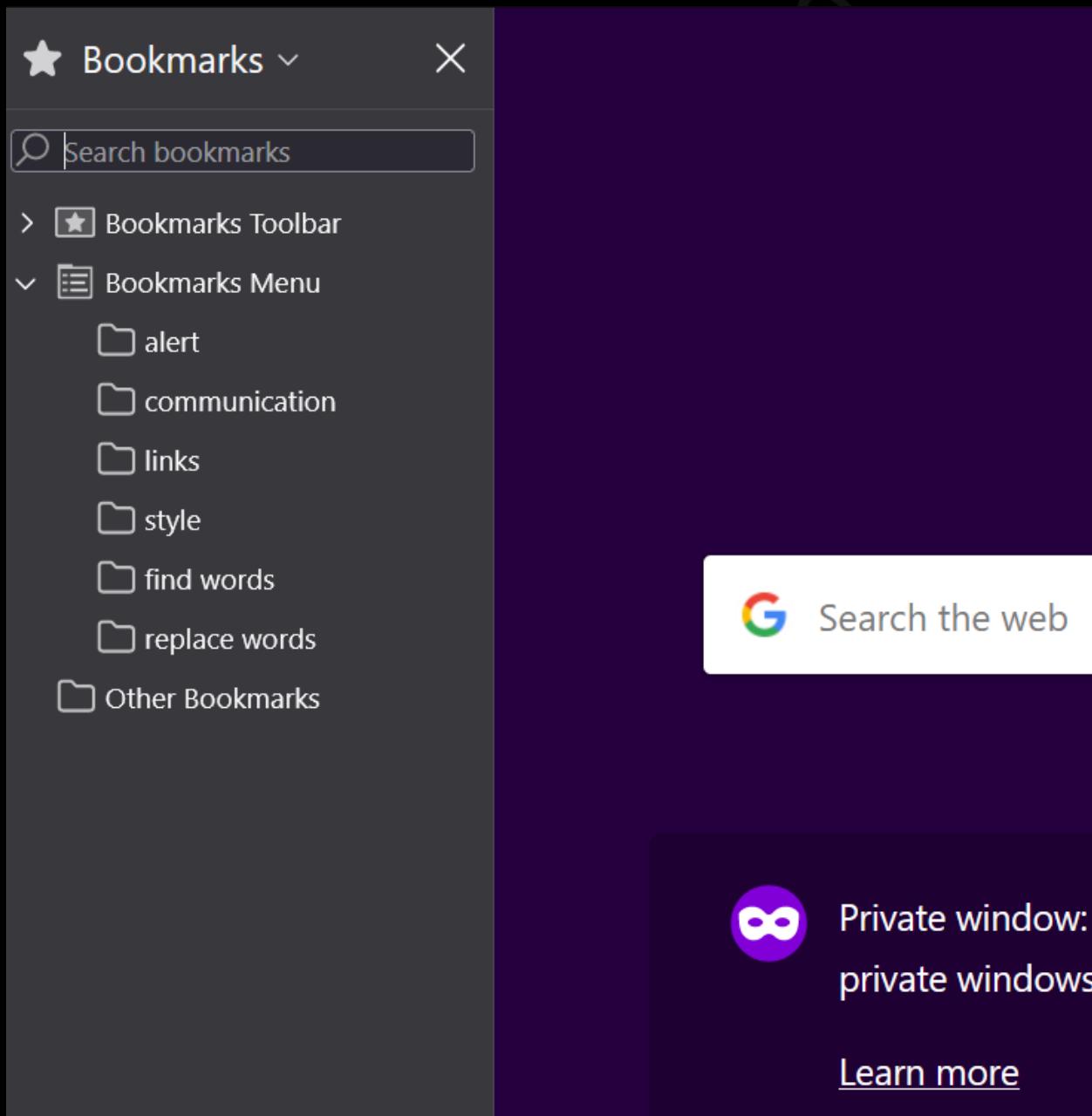
Since we have many thousands of scripts, that we want to keep organized, we keep our scripts in project folders, instead of relying on bookmarks in the browser.

Remember to keep code organized in folders.

Show Bookmarks Panel - Control + B

We can show our Bookmarks folders that we have made on a side panel.

This way we can have many thousands of scripts easily organized into folders and use them when we want.





JAVASCRIPT IS THE MOST SPOKEN
LANGUAGE IN THE UNIVERSE STARK.

Why are you doing this Thanos?
Why are you helping us now?

Gamora!

```
javascript:(  
/* How to Add Comments */  
function()  
{  
    function askName()  
{  
        let name = prompt("Enter Name");  
  
        /* Here is another comment. Comments  
        can be on multiple lines using this way */  
  
        return name;  
    }  
  
    alert("Hi " + askName());  
}  
);
```

When making JavaScript Bookmarklets,
we do NOT use // to make comments
Instead, we use /* */ to make comments.
By using /* */ any code in between will be
commented out, whilst the code before and after
will NOT be effected.



**THE FOUNDATION OF THE UNIVERSE
IS LOGICAL STARK.**

**JAVASCRIPT CAN ACCESS AND EXPRESS
THE SOURCE OF ALL LOGIC
USING MY DEVICE.**

**IT IS MORE POWERFUL THAN ANY WEAPON
ON EARTH OR SATURN.**

THE DESIGN IS READY STARK.

**YOUR TEAM HAS ONE YEAR
BEFORE THEIR SHIP ARRIVES.**

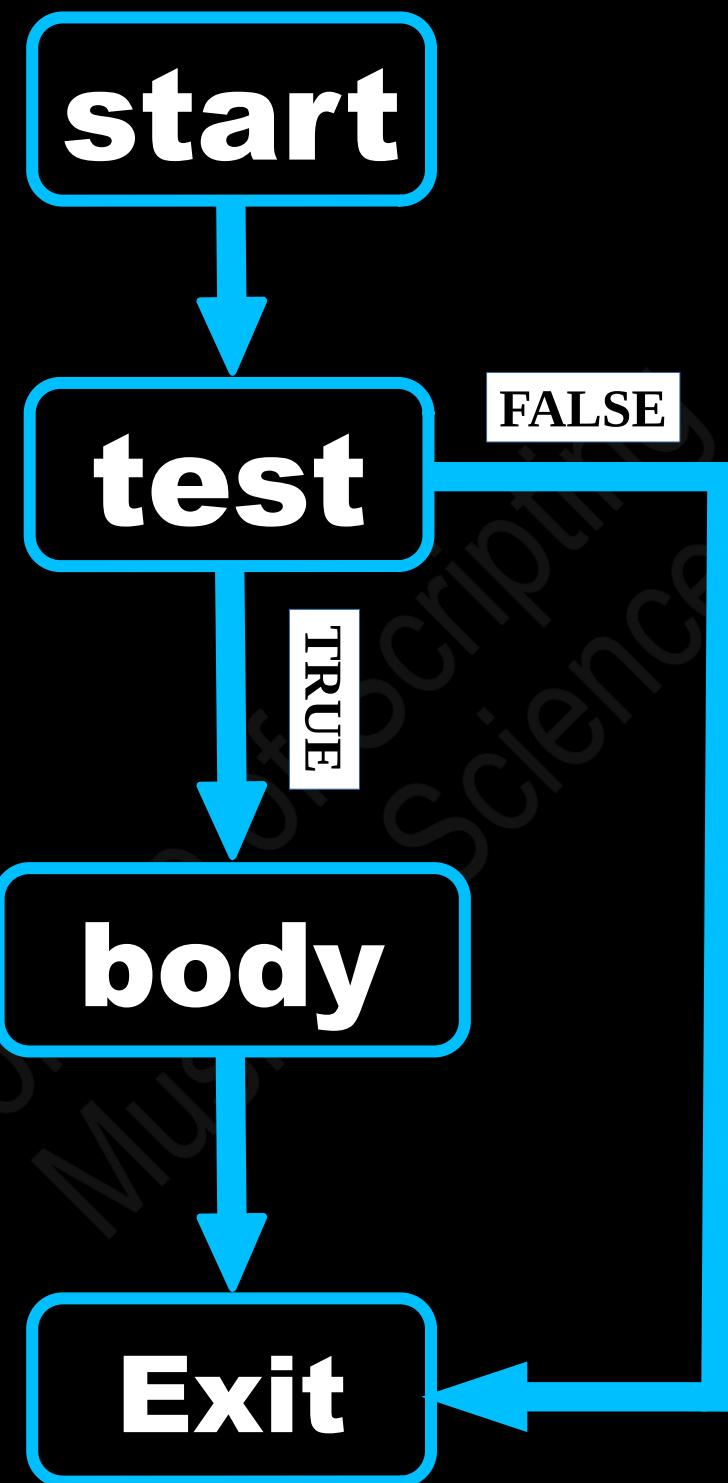
```
javascript:(
/* prompt, if, toLowerCase, alert, == Equal To */
function()
{
    function askName()
    {
        let name = prompt("Enter
Name").toLowerCase();

        if (name == "john")
        {
            alert("Hi " + name);
        }
    }

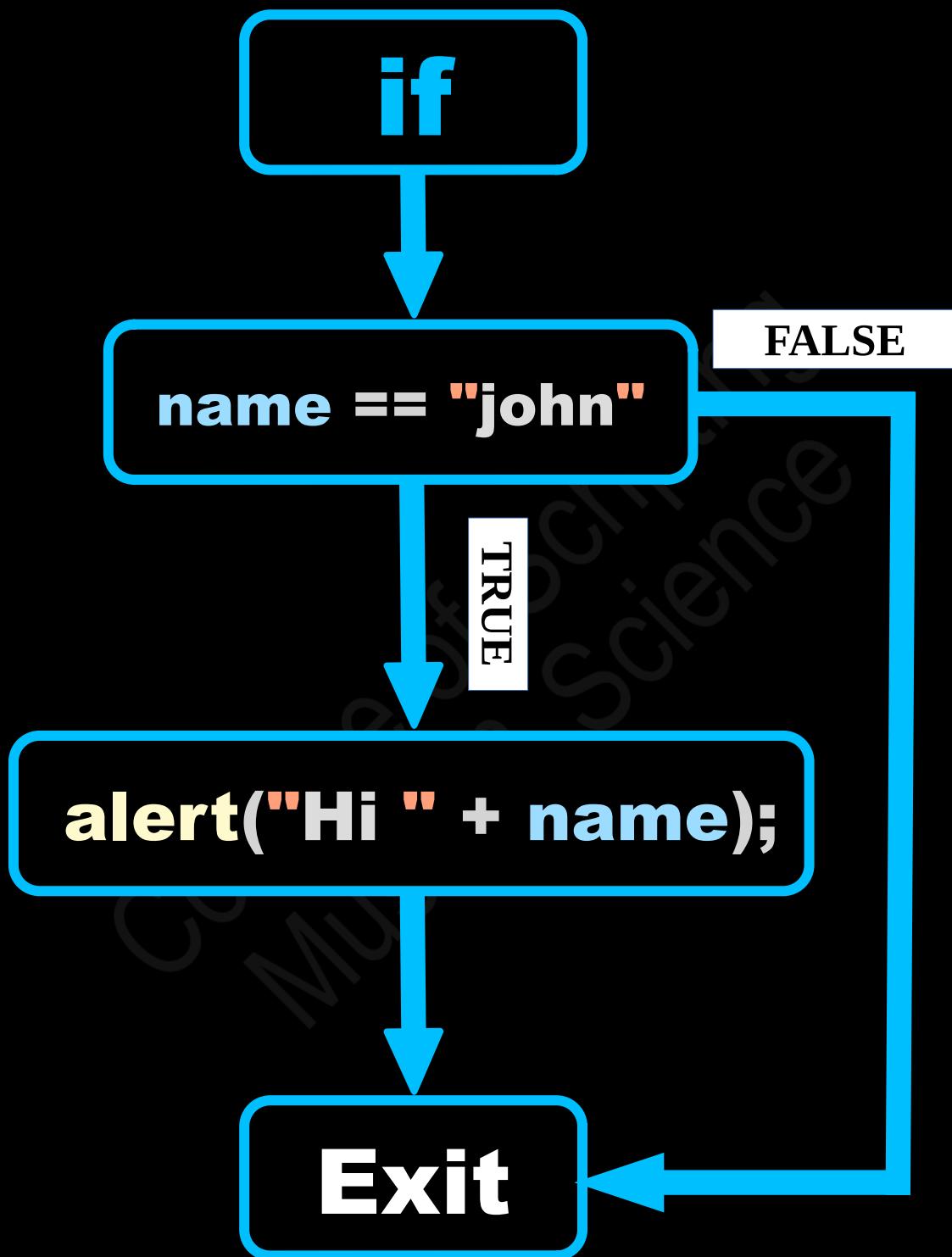
    askName();
}

/* This alert message will trigger if the person
types the name John John john JoHN
JOHN etc. But, if the person uses spaces, it
will NOT trigger. Jo hn, or JOH N or J O H N, it
will NOT trigger. */
```

/* if diagram */



/* if diagram with a test condition */





**Tony, you're asking me to teach
300 million people to become master
programmers in less than one year to
program drone armies to defeat who?**

GALACTUS!

**He plans on extermination!
Without the drone army, Earth Ends
in one year, when his ship arrives.**

```
javascript:(  
/* prompt, if else, toLowerCase, == Equal To */  
function()  
{  
    function askName()  
    {  
        let name = prompt("Enter  
Name").toLowerCase();  
  
        if (name == "john")  
        {  
            return "Hi John";  
        }  
        else  
        {  
            return "Hi " + name + " Where is John";  
        }  
    }  
  
    alert(askName());  
}  
);
```

```
javascript:(
/* prompt, if else, toLowerCase, != Not Equal To */
function()
{
    function askName()
    {
        let name = prompt("Enter
Name").toLowerCase();

        if (name != "john")
        {
            return "Hi " + name + " Where is John";
        }
        else
        {
            return "Hi John";
        }
    }

    alert(askName());
}

);
```

```
javascript:(
/* prompt OK and Cancel Button Responses */
function()
{
    function askName()
    {
        let name = prompt("Enter Name");

        if (name == null)
        {
            return "You pressed the Cancel button";
        }
        if (name == "")
        {
            return "You pressed OK without first
entering your name";
        }

        return name;
    }

    alert("Hi " + askName());
}

/*

```

if the person enters their name and presses OK, it says their name.

if the person presses the OK button without first entering their name, it tells them that they didn't enter their name

if the person presses the Cancel button it tells them that they pressed the Cancel button.

***/**

```
javascript:(
/* prompt if else if, < less than, > greater than */
function()
{
    function askQuestion()
    {
        let question = prompt("What is 5 x 5?");

        if (question < 25)
        {
            return "A bit higher";
        }
        else if (question > 25)
        {
            return "A bit lower";
        }
        else
        {
            return "Correct";
        }
    }

    alert(askQuestion());
}
);
```



**Jarvis, search for how Galactus located the
Anti-Life Equation.**

**Jarvis simulation result:
"Darkseid"**

**That does not sound like
a friendly fellow.**

```
javascript:(  
/* prompt, if else if, do while loop, <, >, != */  
function()  
{  
    function askQuestion()  
    {  
        let message;  
  
        do  
        {  
            let question = prompt("What is 5 x 5?");  
  
            if (question < 25)  
            {  
                message = "A bit higher";  
            }  
            else if (question > 25)  
            {  
                message = "A bit lower";  
            }  
            else  
            {  
                message = "Correct";  
            }  
            alert(message);  
    }  
}
```

```
}

while (question != 25);

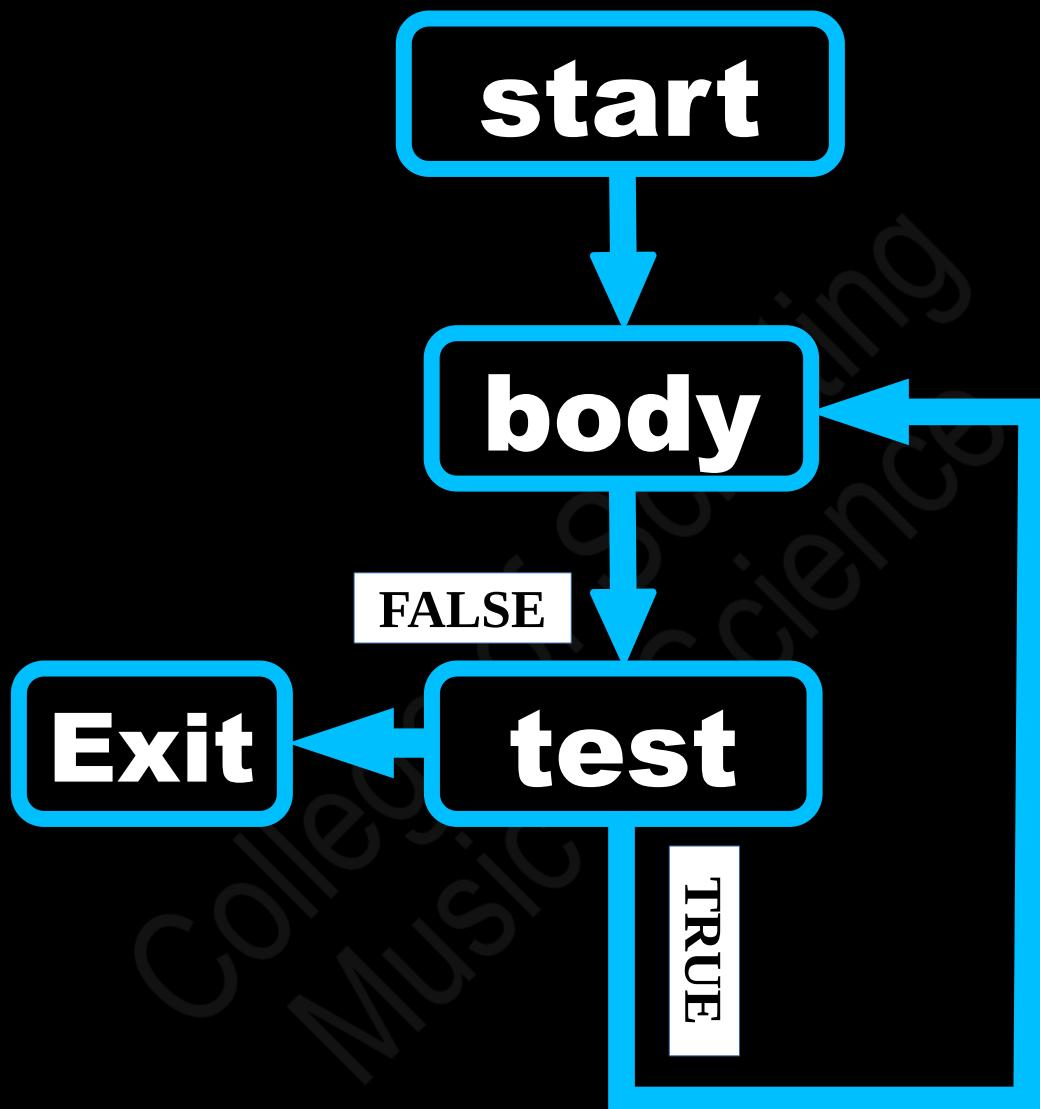
}

askQuestion();
```

```
}());
```

College of Scripting
MUSIC & SCIENCE

/* do while loop diagram */



```
javascript:(
/* prompt, if, while loop, < less than */
function()
{
    function askQuestion()
    {
        let players = prompt("Enter Number of
Players");

        let x = 0;

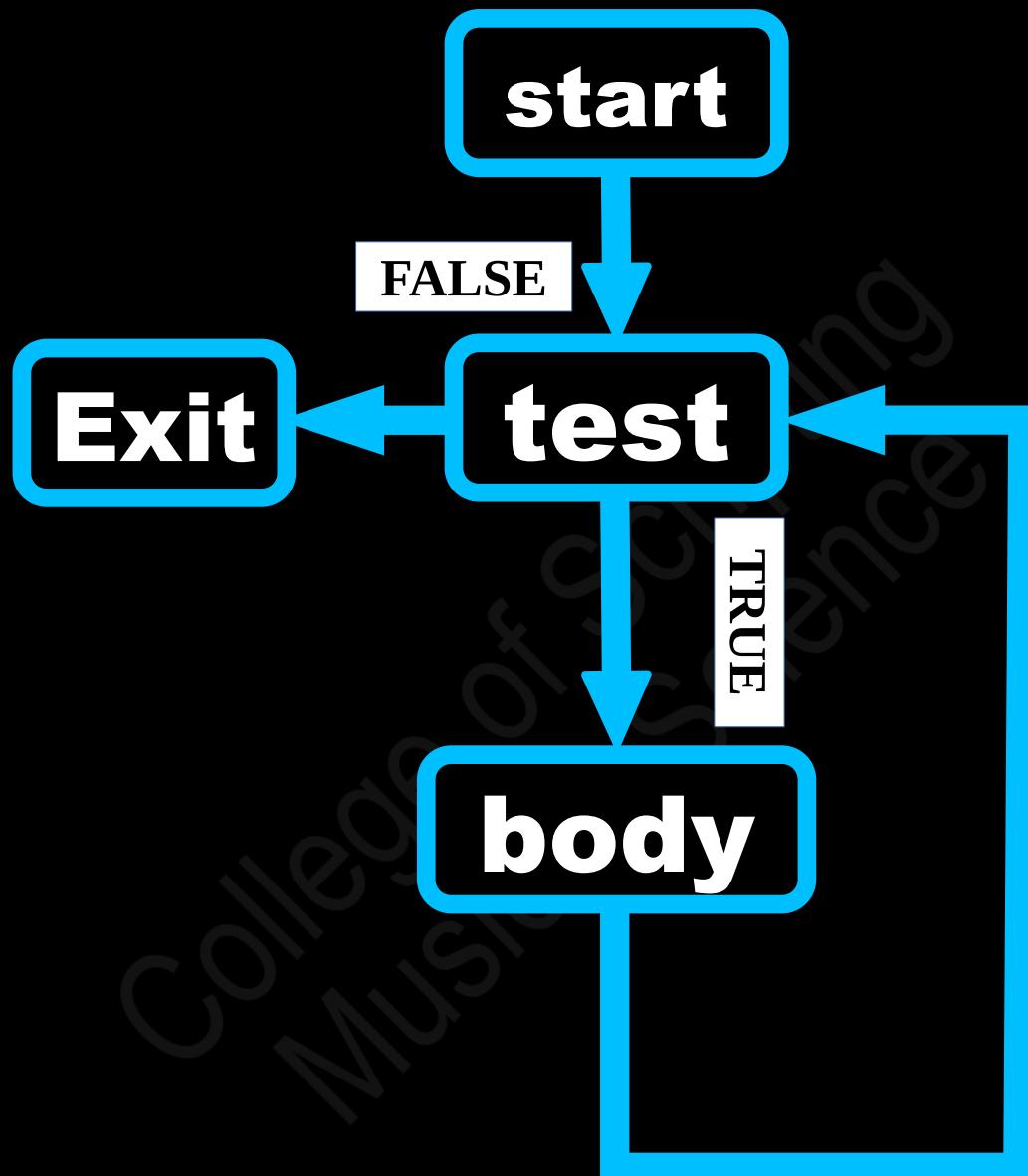
        while (x < players)
        {
            x++;

            console.log("Player " + x + ", ");
        }
    }

    askQuestion();
}

());
```

/* while loop diagram */



```
javascript:(  
/* prompt, if, while loop, <= less than */  
function()  
{  
    function askQuestion()  
{  
        let players = prompt("Enter Number of  
Players");  
  
        let x = 1;  
  
        while (x <= players)  
        {  
            console.log("Player " + x + ", ");  
  
            x++;  
        }  
    }  
    askQuestion();  
}  
);
```

```
javascript:(
/* prompt, for loop, createElement */
function()
{
    function askQuestion()
    {
        let players = prompt("Enter Number of
Players");

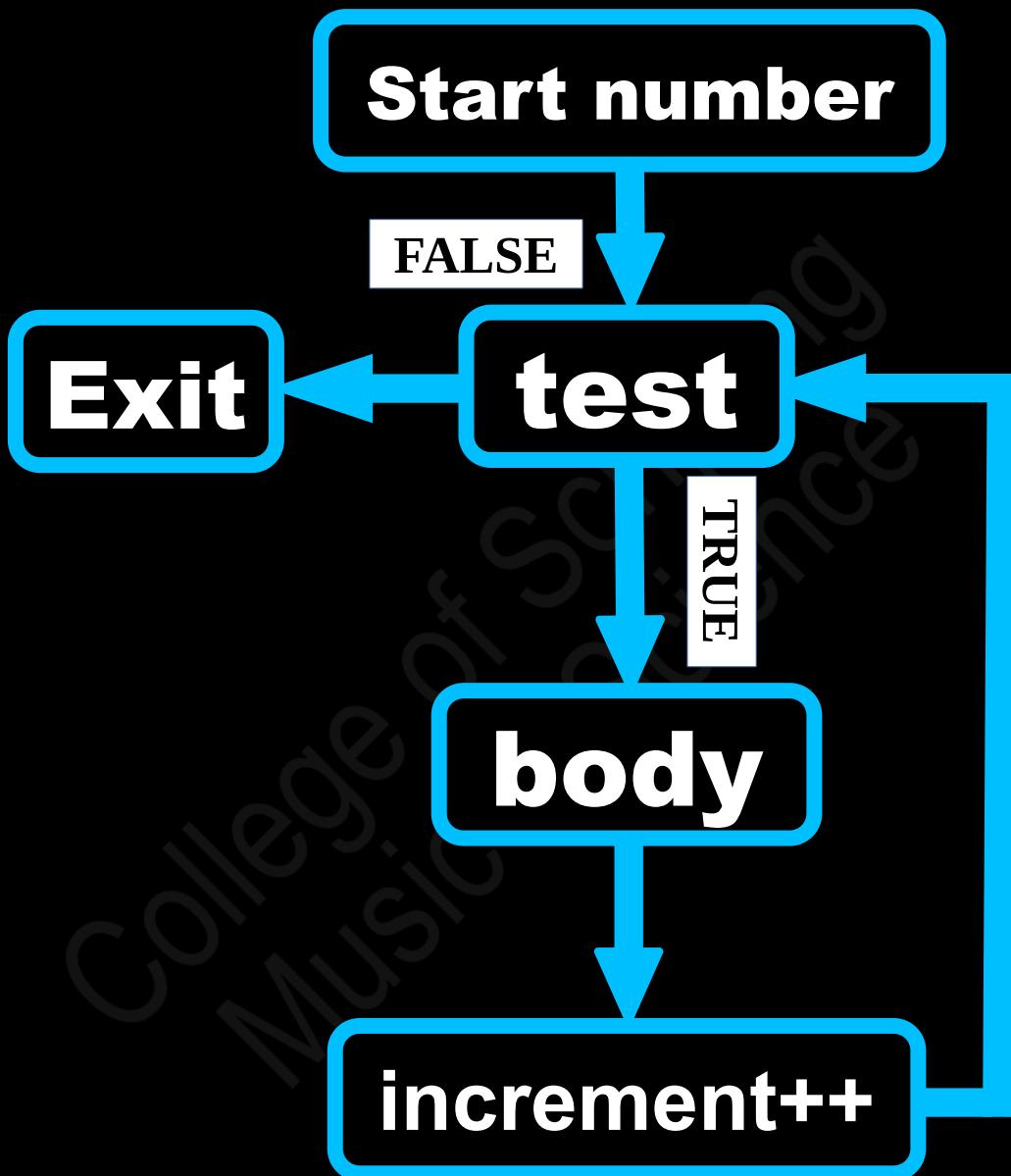
        let mainDiv =
document.createElement("div");
        mainDiv.style.position = "absolute";
        mainDiv.style.width = 200 + "px";
        mainDiv.style.height = 200 + "px";
        mainDiv.style.display = "flex";
        mainDiv.style.flexDirection = "column";
        mainDiv.style.overflowY = "scroll";
        document.body.append(mainDiv);

        for (let x = 0; x < players; x++)
        {
            let player =
document.createElement("button");
            player.onclick = function()

```

```
{  
    alert("Player " + x );  
};  
  
player.innerHTML = "Player " + x;  
  
mainDiv.append(player);  
}  
}  
  
askQuestion();  
  
}());  
  
/*  
We use a for loop to display how many players  
the user chose  
*/
```

/* for loop diagram */



```
javascript:(
/* prompt, for loop with break */
/* we use a for loop to display how many
players the user chose and use break if it is
not enough players chosen */
function()
{
    function askQuestion()
    {
        let players = prompt("Enter Number of
Players");

        for (let x = 1; x <= players; x++)
        {
            if (players <= 3)
            {
                alert(players + " people is not
enough");

                break;
            }

            console.log("Player " + x + ", ");
        }
    }
}
```

```
askQuestion();  
};});
```

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**EITHER WE WIN THIS WAR
OR HUMANITY IS FOREVER LOST.
JAVASCRIPT IS KEY TO OUR
VICTORY!**

**300 million master programmers will combat
swarms of billions of invading
drone bots, coming from their main ship.**

Stark has to do his part and so do we!

There is a trillion bot army on the way!

```
javascript:(
/* Date, Time, Time zone */
function()
{
    function getDateAndTime()
    {
        let currentDate = new Date();

        return currentDate;
    }

    console.log(getDateAndTime());

    alert(getDateAndTime());

}());

/*
Sun Aug 27 2023 07:41:22 GMT-0400 (Eastern
Daylight Time)
*/
```

```
javascript:(
/* Date and Time - toLocaleString */
function()
{
    function getDateAndTime()
    {
        let currentDate = new Date();

        let dateString =
currentDate.toLocaleString();

        return dateString;
    }

    console.log(getDateAndTime());

    alert(getDateAndTime());
}

/*
8/27/2023, 7:35:23 AM
*/
```

```
javascript:(
/* Date - Year */
function()
{
    function getTheYear()
    {
        let currentDate = new Date();

        let year = currentDate.getUTCFullYear();

        return year;
    }

    console.log("Year: " + getTheYear());

    alert("Year: " + getTheYear());
}

/*
Year: 2023
*/
```

```
javascript:(  
/* Date - Month */  
function()  
{  
    function getTheMonth()  
{  
        let currentDate = new Date();  
  
        let month = currentDate.getMonth();  
  
        if (month == 0)  
        {  
            return "January";  
        }  
        else if (month == 1)  
        {  
            return "February";  
        }  
        else if (month == 2)  
        {  
            return "March";  
        }  
        else if (month == 3)  
        {  
            return "April";  
        }  
    }  
}
```

```
else if (month == 4)
{
    return "May";
}
else if (month == 5)
{
    return "June";
}
else if (month == 6)
{
    return "July";
}
else if (month == 7)
{
    return "August";
}
else if (month == 8)
{
    return "September";
}
else if (month == 9)
{
    return "October";
}
else if (month == 10)
{
```

```
    return "November";
}
else if (month == 11)
{
    return "December";
}

return month;
}

console.log("Month is: " + getTheMonth());

alert("Month is: " + getTheMonth());

}());
```

/*
August
*/

```
javascript:(  
/* Date - Day */  
function()  
{  
    function getTheDay()  
{  
        let currentDate = new Date();  
  
        let day = currentDate.getDay();  
  
        if (day == 0)  
        {  
            return "Sunday";  
        }  
        else if (day == 1)  
        {  
            return "Monday";  
        }  
        else if (day == 2)  
        {  
            return "Tuesday";  
        }  
        else if (day == 3)  
        {  
            return "Wednesday";  
        }  
    }  
}
```

```
else if (day == 4)
{
    return "Thursday";
}
else if (day == 5)
{
    return "Friday";
}
else if (day == 6)
{
    return "Saturday";
}

return day;
}

console.log("Today is: " + getTheDay());

alert("Today is: " + getTheDay());

}());
```

/*
Sunday
*/

```
javascript:(  
/* Date - Time - Military - 24 Hour Format */  
function()  
{  
    function getMilitaryTime()  
{  
        let currentDate = new Date();  
        let hours = currentDate.getHours();  
        let minutes = currentDate.getMinutes();  
        let seconds = currentDate.getSeconds();  
  
        if (minutes < 10)  
        {  
            minutes = "0" + minutes;  
        }  
  
        if (seconds < 10)  
        {  
            seconds = "0" + seconds;  
        }  
  
        let timeString = hours + ":" + minutes + ":"  
        + seconds;  
  
        return timeString;  
    }  
}
```

```
console.log("Time: " + getMilitaryTime());  
  
alert("Time: " + getMilitaryTime());  
  
}());  
  
/*  
Time: 8:38:28  
*/
```

```
javascript:(  
/* Date - Time - AM or PM - 12 Hour Format */  
function()  
{  
    function getTheTime()  
{  
        let currentDate = new Date();  
        let hours = currentDate.getHours();  
        let minutes = currentDate.getMinutes();  
        let seconds = currentDate.getSeconds();  
        let amOrPm;  
  
        if (hours >= 12)  
        {  
            amOrPm = "PM";  
            if (hours > 12)  
            {  
                hours -= 12;  
            }  
        }  
        else  
        {  
            amOrPm = "AM";  
            if (hours === 0)  
            {  
                hours = 12;  
            }  
        }  
        return hours + ":" + minutes + ":" + seconds + " " + amOrPm;  
    }  
    return getTheTime();  
}
```

```
        }
    }

if (minutes < 10)
{
    minutes = "0" + minutes;
}

if (seconds < 10)
{
    seconds = "0" + seconds;
}

let timeString = hours + ":" + minutes + ":" +
+ seconds + " " + amOrPm;

return timeString;
}

console.log("Time: " + getTheTime());

alert("Time: " + getTheTime());

}());
```

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```
javascript:(  
/* Date - Time - AM or PM - 12 Hour Format –  
Updates Time in a div */  
function()  
{  
    function getTheTime()  
{  
        let currentDate = new Date();  
        let hours = currentDate.getHours();  
        let minutes = currentDate.getMinutes();  
        let seconds = currentDate.getSeconds();  
        let amOrPm;  
  
        if (hours >= 12)  
        {  
            amOrPm = "PM";  
            if (hours > 12)  
            {  
                hours -= 12;  
            }  
        }  
        else  
        {  
            amOrPm = "AM";  
            if (hours === 0)  
            {  
                hours = 12;  
            }  
        }  
        let timeString = hours + ":" + minutes + ":" + seconds + " " + amOrPm;  
        document.getElementById("time").innerHTML = timeString;  
    }  
    getTheTime();  
    setInterval(getTheTime, 1000);  
}
```

```
    hours = 12;
}
}

if (minutes < 10)
{
    minutes = "0" + minutes;
}

if (seconds < 10)
{
    seconds = "0" + seconds;
}

let timeString = hours + ":" + minutes + ":" +
+ seconds + " " + amOrPm;

return timeString;
}

function createTimeText()
{
    let timeDiv =
document.createElement("div");
    timeDiv.style.position = "fixed";
    timeDiv.style.right = "0px";
```

```
timeDiv.style.top = "0px";
timeDiv.style.paddingLeft = "15px";
timeDiv.style.paddingRight = "15px";
timeDiv.style.paddingTop = "5px";
timeDiv.style.paddingBottom = "5px";
timeDiv.style.borderRadius = "8px";
timeDiv.style.backgroundColor = "rgb(0,
0, 0)";

timeDiv.style.fontSize = "30px";
timeDiv.style.color = "rgb(255, 255, 255)";

setInterval(function()
{
    timeDiv.innerHTML = getTheTime();
}, 1000);

document.body.append(timeDiv);

}

createTimeText();

}());

/* Time: 8:57:17 AM */
```

```
javascript:(  
/* Title of the webpage */  
function()  
{  
    function titleOfPage()  
{  
        let title = document.title;  
  
        return title;  
    }  
  
    console.log(titleOfPage());  
  
    alert(titleOfPage());  
}());
```

```
javascript:(  
/* URL of the webpage */  
function()  
{  
    function urlOfPage()  
{  
        let url = window.location.href;  
  
        return url;  
    }  
  
    console.log(urlOfPage());  
  
    alert(urlOfPage());  
}());
```

```
javascript:(  
/* Title and URL of the webpage */  
function()  
{  
    function titleOfPage()  
{  
        let title = document.title;  
  
        return title;  
    }  
  
    function urlOfPage()  
{  
        let url = window.location.href;  
  
        return url;  
    }  
  
    console.log(titleOfPage() + "\n" +  
urlOfPage());  
  
    alert(titleOfPage() + "\n" + urlOfPage());  
}());
```

```
javascript:(
/* Title and URL of the webpage as a single
function */
function()
{
    function getPageData()
    {
        let pageTitle = document.title;

        let pageURL = window.location.href;

        let pageData =
        "Title: " + pageTitle + "\n" +
        "URL: " + pageURL;

        return pageData;
    }

    console.log(getPageData());

    alert(getPageData());
}

());
```

```
javascript:(  
/* Elements - How Many Elements on a Page */  
function()  
{  
    function howManyElements()  
{  
        let elements =  
document.getElementsByTagName("*");  
  
        let elementCount = elements.length;  
  
        return elementCount;  
    }  
  
    console.log(howManyElements());  
  
    alert(howManyElements());  
}  
);
```

```
javascript:(  
/* Images - How many Images on a page */  
function()  
{  
    function howManyImages()  
{  
        let images =  
document.getElementsByTagName('img');  
  
        let imageCount = images.length;  
  
        return imageCount;  
    }  
  
    console.log("Number of images is " +  
howManyImages());  
  
    alert("Number of images is " +  
howManyImages());  
}  
);
```

```
javascript:(
/* Links - How many Images on a page */
function()
{
    function howManyLinks()
    {
        let links =
document.getElementsByTagName('a');

        let linksCount = links.length;

        return linksCount;
    }

    console.log("Number of Links: " +
howManyLinks());

    alert("Number of Links: " +
howManyLinks());
}

/* On the next page we make a more
generalized function, so that we can choose
which Element type that we want to get by
using the name of the element type. */
```

```
javascript:(  
/* How many specified elements */  
function()  
{  
    function  
howManySpecifiedElements(whichElementType)  
    {  
        let elements =  
document.getElementsByTagName(whichElementType);  
  
        let elementCount = elements.length;  
  
        return elementCount;  
    }  
  
    console.log(howManySpecifiedElements("a"));  
  
    alert(howManySpecifiedElements("a"));  
}());
```

```
javascript:(
/* Style Links */
function()
{
    function styleLinks()
    {
        let links =
document.getElementsByTagName('a');

        for (let x = 0; x < links.length; x++)
        {
            links[x].style.backgroundColor = "rgb(0,
255, 255)";

            links[x].style.color = "rgb(0, 0, 0)";
        }
    }

    styleLinks();
}

());
```

```
javascript:(  
/* Style Specified Elements */  
function()  
{  
    function  
styleSpecifiedElements(whichElementType)  
    {  
        let elements =  
document.getElementsByTagName(whichElementType);  
  
        for (let x = 0; x < elements.length; x++)  
        {  
            elements[x].style.backgroundColor =  
"rgb(0, 255, 255)";  
  
            elements[x].style.color = "rgb(0, 0, 0)";  
        }  
    }  
  
    styleSpecifiedElements("a");  
  
}());
```

```
javascript:(
/* Text Color of a Webpage Changed to Aqua */
function()
{
    function textColorChange()
    {
        let style =
document.createElement("style");
        style.textContent = "body * { color: aqua !important; }";
        document.head.append(style);
    }
    textColorChange();
}());
/* !important makes a CSS rule a higher specificity. It overrides any other styles, even if those other styles are defined later in the stylesheet or even inline styles */
```

```
javascript:(  
/* Text Color of a Webpage Changed to a  
Specified Color */  
function()  
{  
    function textColorChange(whichColor)  
    {  
        let style =  
document.createElement("style");  
  
        style.textContent = "body * { color: " +  
whichColor + " !important; }";  
  
        document.head.append(style);  
    }  
  
    textColorChange("aqua");  
}  
);
```



The AI Language that Thanos delivered to Stark will unleash the end of the humans and every vessel of moving heat on that planet. There will be no escape from my creation. I will finally complete my goal of ending the cycle.

```
javascript:(
/* Style All Elements of a Specified Type */
function()
{
    function styleElement(whichElementType)
    {
        let elements =
document.getElementsByTagName(whichElementType);

        for (let x = 0; x < elements.length; x++)
        {
            elements[x].style.borderStyle = "solid";
            elements[x].style.borderWidth = 1 +
"px";
            elements[x].style.borderRadius = 8 +
"px";
            elements[x].style.borderColor = "rgb(0,
255, 255)";
            elements[x].style.fontSize = 20 + "px";
        }
    }
})()
```

```
elements[x].style.fontWeight = "bold";  
}  
}  
  
styleElement("div");  
}());
```

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```
javascript:(  
/* Number of Elements of a Specified Type on a  
Page */  
function()  
{  
    function  
getNumberOfSpecifiedElement(whichElement)  
    {  
        let elements =  
document.getElementsByTagName(whichElem  
ent);  
  
        return elements.length;  
    }  
  
console.log(getNumberOfSpecifiedElement("di  
v"));  
  
alert(getNumberOfSpecifiedElement("div"));  
}());
```

```
javascript:(  
/* Show the InnerHTML of each specified  
element type on a Page */  
function()  
{  
    function  
showElementInnerHTML(whichElementType)  
    {  
        let report = "";  
  
        let elements =  
document.getElementsByTagName(whichElem  
entType);  
  
        for (let x = 0; x < elements.length; x++)  
        {  
            report += elements[x].innerHTML;  
  
            report += "\n";  
        }  
  
        console.log(report);  
  
        alert(report);  
    }  
}
```

```
showElementInnerHTML("p");  
}  
  
/*  
Show innerHTML of element types, such as:  
/*  
<p>: Paragraph elements.  
<h1>, <h2>, <h3>, <h4>, <h5>, <h6>: Headings  
of different levels.  
<div>: Div elements.  
<span>: Span elements.  
<li>: List item elements within <ul> or <ol>.  
<a>: Anchor links.  
<button>: Buttons.  
<label>: Labels for form elements.  
<textarea>: Textareas within forms.  
<option>: Options within <select> elements.  
<blockquote>: Block quotes.  
<cite>: Citations within block quotes.  
<abbr>: Abbreviations.  
<code>: Code snippets.  
<pre>: Preformatted text.  
*/
```

```
javascript:(  
/* Show the src of each specified element type  
on a Page */  
function()  
{  
    function  
    showElementsSrc(whichElementType)  
    {  
        let report = "";  
  
        let elements =  
document.getElementsByTagName(whichElementType);  
  
        for (let x = 0; x < elements.length; x++)  
        {  
            report += elements[x].src;  
  
            report += "\n";  
        }  
  
        console.log(report);  
  
        alert(report);  
    }  
}
```

```
showElementsSrc("img");
```

```
});
```

```
/*
```

Show src of element types, such as:

: Image elements.

<input>: Input elements.

<script>: Script elements.

```
*/
```

```
javascript:(  
/* Show the href of each specified element type  
on a Page */  
function()  
{  
    function  
    showElementsHref(whichElementType)  
    {  
        let report = "";  
  
        let elements =  
document.getElementsByTagName(whichElementType);  
  
        for (let x = 0; x < elements.length; x++)  
        {  
            report += elements[x].href;  
  
            report += "\n";  
        }  
  
        console.log(report);  
  
        alert(report);  
    }  
}
```

```
showElementsHref("link");
```

```
});
```

```
/*
```

Show href of element types, such as:

<a>: Anchor elements.

<link>: Link elements, such as style sheets.

```
*/
```

```
javascript:(  
/* Show the InnerHTML of the specified  
element type and style it */  
function()  
{  
    function  
showElementInnerHTML(whichElementType)  
    {  
        let report = "";  
  
        let elements =  
document.getElementsByTagName(whichElem  
entType);  
  
        for (let x = 0; x < elements.length; x++)  
        {  
            elements[x].style.padding = 10 + "px";  
  
            elements[x].style.borderStyle = "solid";  
  
            elements[x].style.borderWidth = 2 +  
"px";  
  
            elements[x].style.borderColor = "rgb(0,  
255, 255)";
```

```
elements[x].style.fontWeight = "bold";  
  
report += elements[x].innerHTML;  
  
report += "\n";  
}  
  
console.log(report);  
  
alert(report);  
}  
  
showElementInnerHTML("p");  
}());
```

```
javascript:(  
/* Show All Image URLs */  
function()  
{  
    function showImageUrls()  
    {  
        let report = "";  
  
        let theLinks =  
document.getElementsByTagName("img");  
  
        for (let x = 0; x < theLinks.length; x++)  
        {  
            report += theLinks[x].src;  
  
            report += "\n";  
        }  
  
        console.log(report);  
  
        alert(report);  
    }  
  
    showImageUrls();  
}
```

```
});
```

```
/*
```

alert shows a limited amount of characters.

Use console.log or other method to show all image links found, when there are many.

Press F12 to see the console report.

```
*/
```

```
javascript:(
/* Show All Image URLs with style */
function()
{
    function showImageUrls()
    {
        let report = "";

        let images =
document.getElementsByTagName("img");

        for (let x = 0; x < images.length; x++)
        {
            images[x].style.borderStyle = "solid";
            images[x].style.borderWidth = 2 + "px";
            images[x].style.borderColor = "rgb(0,
255, 255)";

            report += images[x].src;
            report += "\n";
        }
    }
}
```

```
console.log(report);  
  
alert(report);  
}  
  
showImageUrls();  
  
}());
```

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```
javascript:(
/* Show All Buttons with style */
function()
{
    function showButtons()
    {
        let report = "";

        let buttons =
document.getElementsByTagName("button");

        for (let x = 0; x < buttons.length; x++)
        {
            buttons[x].style.borderStyle = "solid";
            buttons[x].style.borderWidth = 2 + "px";
            buttons[x].style.borderColor = "rgb(0,
255, 255)";

            report += buttons[x].innerHTML;
            report += "\n";
        }
    }
}
```

```
console.log(report);  
  
alert(report);  
}  
  
showButtons();  
  
}());
```

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```
javascript:(
/* Show All Links with style */
function()
{
    function showLinks()
    {
        let report = "";

        let links =
document.getElementsByTagName("a");

        for (let x = 0; x < links.length; x++)
        {
            links[x].style.borderWidth = 2 + "px";
            links[x].style.borderColor = "rgb(0, 255,
255)";
            report += links[x].href;
            report += "\n";
        }
    }
}
```

```
console.log(report);  
  
alert(report);  
}  
  
showLinks();  
  
}());
```

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```
javascript:(
/* Get Selected Text */
function()
{
    function getSelectedText()
    {
        let selectedText =
window.getSelection().toString();

        return selectedText;
    }

    console.log(getSelectedText());

    alert(getSelectedText());
}
());
```

```
javascript:(  
/* Replace Words on a Webpage */  
function()  
{  
    function replaceWords()  
{  
        let elements =  
document.getElementsByTagName('*');  
  
        for (let x = 0; x < elements.length; x++)  
        {  
            let theElement = elements[x];  
  
            theElement.innerHTML =  
theElement.innerHTML.replace(/\b(?:News)\b/gi  
, 'Howdy');  
  
            theElement.innerHTML =  
theElement.innerHTML.replace(/\b(?:The|Was|  
A|To|Were)\b/gi, 'LOL');  
  
            theElement.innerHTML =  
theElement.innerHTML.replace(/\b(?:What|  
Where|When|Why|How)\b/gi, 'Funny');  
        }  
    }  
}
```

```
replaceWords();  
});  
  
/*
```

/ beginning and ending slashes show the start and end of the regular expression pattern.

g means global and it replaces all occurrences of the pattern, not only the first one.

i means case insensitive, meaning it matches uppercase and lowercase of the found pattern.

\b(?:News)\b The regular expression pattern being searched for

\b word boundary anchor means that the pattern is matched only as a whole word but not as part of a bigger word.

(?:News) This is a non-capturing group that matches the word "News." The ?: at the beginning of the group makes it non-capturing,

which means it won't be found as part of a match.

\b word boundary anchor ensures the whole word is matched.

*/

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```
javascript:(  
/* Replace Words on a Webpage - Variation */  
function()  
{  
    function replaceText(whichElement)  
{  
        whichElement.innerHTML =  
whichElement.innerHTML.replace(/\bgoogle\b/gi, 'Orc Factory');  
    }  
  
    let elements =  
document.getElementsByTagName('*');  
  
    for (let x = 0; x < elements.length; x++)  
    {  
        replaceText(elements[x]);  
    }  
}());
```

```
javascript:(  
/* Images Display to None */  
function()  
{  
    function hidelimages()  
{  
        let images =  
document.getElementsByTagName('img');  
  
        for (let x = 0; x < images.length; x++)  
        {  
            if  
(window.getComputedStyle(images[x]).display  
==="none")  
            {  
                images[x].style.display = "block";  
            }  
            else  
            {  
                images[x].style.display = "none";  
            }  
        }  
        hidelimages();  
    }());
```

```
javascript:(
/* Images - Gray Scale */
function()
{
    function makelimagesGrayScale()
    {
        let thelimages =
document.getElementsByTagName('img');

        for (let x = 0; x < thelimages.length; x++)
        {
            thelimages[x].style.filter =
'grayscale(100%)';
        }
    }

    makelimagesGrayScale();
}

/* selects all img elements on the page and
applies the grayscale filter to them. */
```

```
javascript:(  
/* Toggle Images On/Off */  
function()  
{  
    function toggleImagesOnOrOff()  
{  
        let images =  
document.getElementsByTagName('img');  
  
        for (let x = 0; x < images.length; x++)  
        {  
            let display =  
window.getComputedStyle(images[x]).display;  
  
            if (display === 'none')  
            {  
                images[x].style.display = 'block';  
            }  
            else  
            {  
                images[x].style.display = 'none';  
            }  
        }  
    }  
  
    toggleImagesOnOrOff();  
}
```

```
});
```

```
/*
```

```
if images are hidden, it will show them
```

```
if images are visible, it will hide them
```

```
*/
```

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```
javascript:(  
/* Mouse Click Changes Font Weight */  
function()  
{  
    function mouseTriggersStyle()  
{  
        document.onclick = function()  
{  
            let elements =  
document.getElementsByTagName('*');  
  
            for (let x = 0; x < elements.length; x++)  
{  
                elements[x].style.fontWeight =  
"bold";  
            }  
        };  
    }  
  
    mouseTriggersStyle();  
  
}());
```

```
javascript:(  
/* Mouse Changes Font Weight Toggles Bold */  
function()  
{  
    function mouseTriggersStyle()  
{  
        let isBold = false;  
  
        document.onclick = function()  
{  
            let elements =  
document.getElementsByTagName('*');  
  
            for (let x = 0; x < elements.length; x++)  
{  
                if (isBold)  
{  
                    elements[x].style.fontWeight =  
"normal";  
                }  
                else  
{  
                    elements[x].style.fontWeight =  
"bold";  
                }  
            }  
        }  
    }  
}
```

```
    isBold = !isBold;  
};  
}  
  
mouseTriggersStyle();  
  
}());
```



**THE TIME HAS COME TO DEPLOY THE
ULTIMATE WORLD PROTECTOR.
ACTIVATE JAVASCRIPT PROGRAM #24828**

**Jarvis: "Are you sure Sir?
There is no recalling that program."**

**Yes, Jarvis.
The world needs it now.**

```
javascript:(
/* Random Number Generator from 1 to 100 */
function()
{
    function generateRandomNumber()
    {
        let randomNumber =
Math.floor(Math.random() * 100) + 1;

        return randomNumber;
    }

    console.log(generateRandomNumber());

    alert(generateRandomNumber());
}());
```

```
javascript:(
/* Random Background Color */
function()
{
    function randomBackgroundColor()
    {
        let randomColor = 'rgb(' +
Math.floor(Math.random() * 255) + ',' +
Math.floor(Math.random() * 255) + ',' +
Math.floor(Math.random() * 255) + ')';
        document.body.style.backgroundColor =
randomColor;
    }
    randomBackgroundColor();
}());
```

```
javascript:(
/* Random Background Color - Variation */
function()
{
    function randomValue()
    {
        return Math.floor(Math.random() * 255);
    }

    let red = randomValue();
    let green = randomValue();
    let blue = randomValue();

    let randomColor = 'rgb('+red+', '+green+', '+
blue+')';

    document.body.style.backgroundColor =
randomColor;
}());
```

```
javascript:(  
/* Random Greeting */  
function()  
{  
    let greetings =  
    [  
        "Hi",  
        "Howdy.",  
        "How ya doing?",  
        "You having fun?",  
        "Glad you are here.",  
        "Nice weather today.",  
        "It's such a nice day out."  
];
```

```
function makeRandomMessage(whichArray)  
{  
    let randomGreeting =  
whichArray[Math.floor(Math.random() *  
whichArray.length)];  
  
    return randomGreeting;  
}
```

```
let message =  
makeRandomMessage(greetings);
```

```
console.log(message);  
  
alert(message);  
  
}());
```

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```
javascript:(
/* Random Quote Generator */
function()
{
    function generateRandomQuote()
    {
        let quotes =
        [
            "Always be kind",
            "Be excellent to each other",
            "Live long and prosper"
        ];
        let randomIndex =
Math.floor(Math.random() * quotes.length);

        let randomQuote = quotes[randomIndex];

        return randomQuote;
    }

    let quote = generateRandomQuote();

    console.log(quote);
    alert(quote);
}());
```

```
javascript:(  
/* Random Font for the entire Webpage */  
function()  
{  
    let fonts =  
    [  
        'Arial',  
        'Times New Roman',  
        'Courier New',  
        'Garamond',  
        'Avant Garde',  
        'Palatino Linotype'  
    ];  
  
    function makeRandomFont()  
    {  
        let elements =  
document.getElementsByTagName('*');  
  
        let randomFont =  
fonts[Math.floor(Math.random() *  
fonts.length)];  
  
        for (let x = 0; x < elements.length; x++)  
        {  
            elements[x].style.fontFamily = randomFont;  
        }  
    }  
}  
);
```

```
elements[x].style.fontFamily =  
randomFont;  
}  
  
console.log('Changed font to ' +  
randomFont);  
  
alert('Changed font to ' + randomFont);  
}  
  
makeRandomFont();  
}());
```

```
javascript:(
/* Random Background Color */
function()
{
    function getRandomColor()
    {
        let r = Math.floor(Math.random() * 255);
        let g = Math.floor(Math.random() * 255);
        let b = Math.floor(Math.random() * 255);

        return 'rgb('+r+', '+g+', '+b+')';
    }

    document.body.style.backgroundColor =
getRandomColor();
}

());
```

```
javascript:(
/* Random BG to Specified Element */
function()
{
    function
styleSpecifiedElements(whichElementType)
{
    let elements =
document.getElementsByTagName(whichElementType);

    for (let x = 0; x < elements.length; x++)
    {
        let randomColor = 'rgb(' +
Math.floor(Math.random() * 255) + ',' +
Math.floor(Math.random() * 255) + ',' +
Math.floor(Math.random() * 255) + ')';

        elements[x].style.backgroundColor =
randomColor;
    }
}

styleSpecifiedElements("a");

}());
```

```
javascript:(  
/* Random BG to Specified Elements –  
Variation */  
function()  
{  
    function  
styleSpecifiedElements(whichElementType,  
whichRgbColor)  
{  
    let theElements =  
document.getElementsByTagName(whichElem  
entType);  
  
    for (let x = 0; x < theElements.length; x++)  
    {  
        theElements[x].style.backgroundColor  
= whichRgbColor;  
    }  
}  
  
styleSpecifiedElements("p", 'rgb(' +  
Math.floor(Math.random() * 255) + ',' +  
Math.floor(Math.random() * 255) + ',' +  
Math.floor(Math.random() * 255) + ')');  
}());
```

```
javascript:(
/* Random Positions for a Circle */
function()
{
    function moveObjectRandomPositions()
    {
        let obj = document.createElement("div");
        obj.style.position = "absolute";
        obj.style.width = "20px";
        obj.style.height = "20px";
        obj.style.background = "aqua";
        obj.style.borderRadius = "50%";
        document.body.append(obj);

        /*----*/
        function getRandomPosition()
        {
            let x = Math.floor(Math.random() *
window.innerWidth);

            let y = Math.floor(Math.random() *
window.innerHeight);

            return {
                x: x,
```

```
        y: y
    };
}

function moveObject()
{
    let pos = getRandomPosition();

    obj.style.left = pos.x + "px";
    obj.style.top = pos.y + "px";
}

/* move every 1 second */
setInterval(moveObject, 1000);
}

moveObjectRandomPositions();

}());
```

```
javascript:(
/* Random Circles Pos and Color */
function()
{
    function randomCirclePosAndColor()
    {
        let circle =
document.createElement("div");
        circle.style.width = "20px";
        circle.style.height = "20px";
        circle.style.borderRadius = "50%";
        circle.style.position = "absolute";
        circle.style.backgroundColor =
getRandomColor();
        document.body.append(circle);

//----//

function getRandomPosition()
{
    let x = Math.floor(Math.random() *
window.innerWidth);
    let y = Math.floor(Math.random() *
window.innerHeight);

    return {

```

```
    x: x,  
    y: y  
};  
}  
  
function getRandomColor()  
{  
    let r = Math.floor(Math.random() * 255);  
    let g = Math.floor(Math.random() * 255);  
    let b = Math.floor(Math.random() * 255);  
  
    return "rgb("+r+", "+g+", "+b+")";  
}  
  
function moveCircle()  
{  
    let pos = getRandomPosition();  
  
    circle.style.left = pos.x + "px";  
  
    circle.style.top = pos.y + "px";  
  
    /* move every 2 seconds */  
    setTimeout(moveCircle, 2000);  
}
```

```
moveCircle();  
}  
  
randomCirclePosAndColor();  
  
}());
```

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```
javascript:(
/* Random Circles Pos and Color - How many
to Create */
function()
{
    function randomCirclePosAndColor()
    {
        let circleCount = prompt("Number of
Circles to Create");

        circleCount = parseInt(circleCount);

        if (isNaN(circleCount) || circleCount <= 0)
        {
            alert("Enter a valid number more than
0");
            return;
        }

        function getRandomPosition()
        {
            let x = Math.floor(Math.random() *
window.innerWidth);
```

```
let y = Math.floor(Math.random() *  
window.innerHeight);  
return {  
  x: x,  
  y: y  
};  
}  
  
function getRandomColor()  
{  
  let r = Math.floor(Math.random() * 255);  
  let g = Math.floor(Math.random() * 255);  
  let b = Math.floor(Math.random() * 255);  
  
  return "rgb("+r+", "+g+", "+b+")";  
}  
  
function moveCircle(circle)  
{  
  let pos = getRandomPosition();  
  
  circle.style.left = pos.x + "px";  
  
  circle.style.top = pos.y + "px";  
  
  /* move every 2 seconds */
```

```
setTimeout(function()
{
    moveCircle(circle);
}, 2000);

}

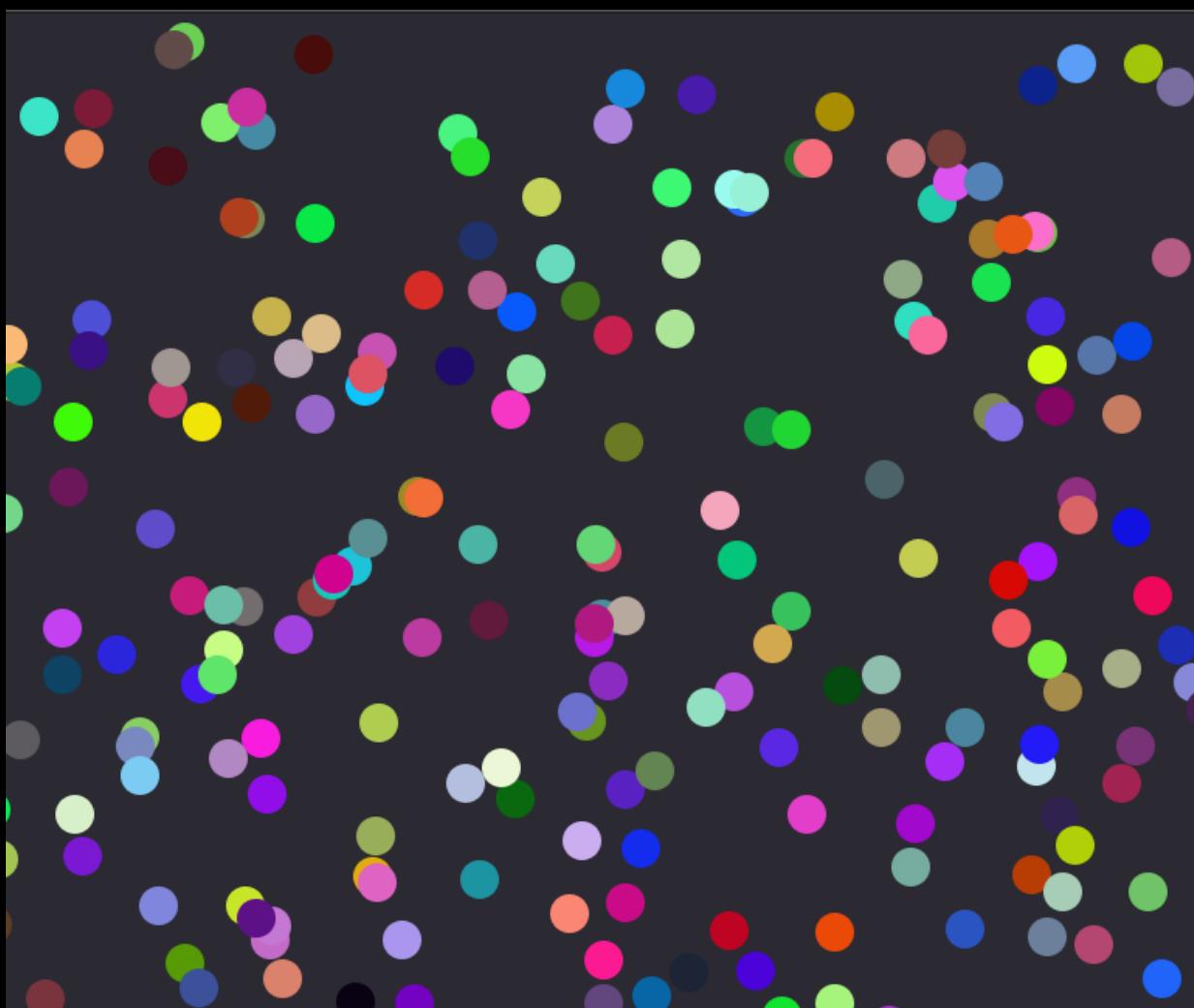
for (let x = 0; x < circleCount; x++)
{
    let circle =
document.createElement("div");
    circle.style.width = "20px";
    circle.style.height = "20px";
    circle.style.borderRadius = "50%";
    circle.style.position = "absolute";
    circle.style.backgroundColor =
getRandomColor();
    document.body.append(circle);

    moveCircle(circle);
}

}

randomCirclePosAndColor();

}());
```



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```
javascript:(
/* Random Pos, Size, Color Objects on Screen */
function()
{
    function generateRandomObjects()
    {
        /* array to hold the random objects */
        let objects = [];

        /* function to create a random object */
        function createRandomObject()
        {
            let object =
document.createElement('div');
            object.style.position = 'absolute';
            object.style.left = Math.random() *
window.innerWidth + 'px';
            object.style.top = Math.random() *
window.innerHeight + 'px';
            object.style.width = Math.random() * 50
+ 'px';
            object.style.height = Math.random() * 50
+ 'px';
            object.style.backgroundColor =
getRandomColor();
    }
}
```

```
document.body.append(object);

/* add the object to the array */
objects.push(object);
}

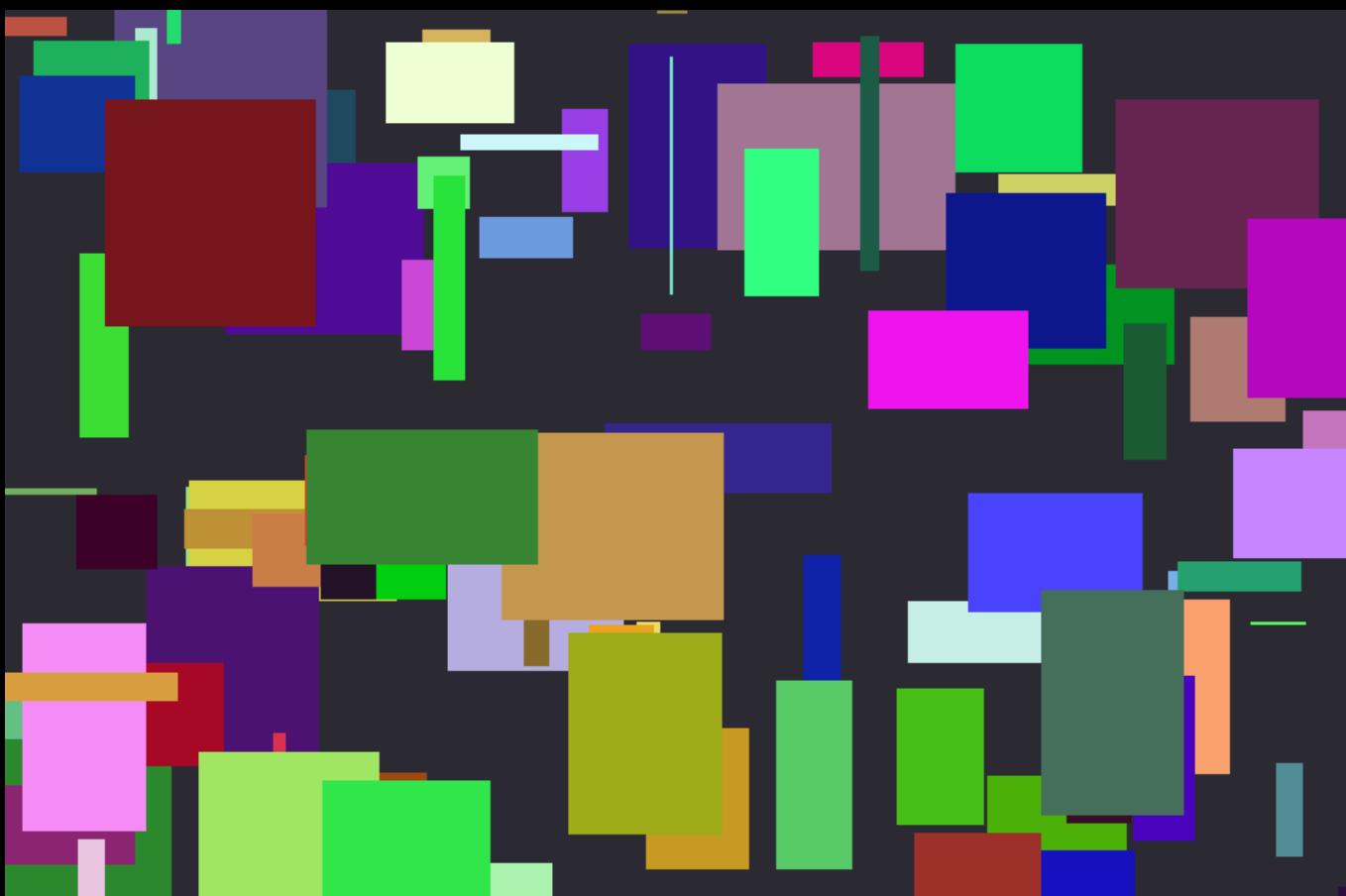
/* function to generate a random color */
function getRandomColor()
{
    let r = Math.floor(Math.random() * 255);
    let g = Math.floor(Math.random() * 255);
    let b = Math.floor(Math.random() * 255);

    return `rgb(${r}, ${g}, ${b})`;
}

// function to move the objects randomly
function moveObjects()
{
    for (let x = 0; x < objects.length; x++)
    {
        const object = objects[x];

        const newX = Math.random() *
window.innerWidth;
```

```
const newY = Math.random() *  
window.innerHeight;  
  
object.style.left = newX + 'px';  
  
object.style.top = newY + 'px';  
}  
}  
  
/* create random objects */  
setInterval(createRandomObject, 1000);  
  
/* move random objects */  
setInterval(moveObjects, 2000);  
}  
  
generateRandomObjects();  
}());
```



/*

More objects will continue to appear on the screen with random position, size and color.

*/

```
javascript:(
/* Random Border Color with Timer */
function()
{
    let theTimer;
    let isRunning = false;

    function getRandomColor()
    {
        let r = Math.floor(Math.random() * 255);
        let g = Math.floor(Math.random() * 255);
        let b = Math.floor(Math.random() * 255);
        return 'rgb('+r+', '+g+', '+b+')';
    }

    function toggleColorChange()
    {
        if (!isRunning)
        {
            document.body.style.borderStyle =
"solid";
            document.body.style.borderColor =
"rgb(255, 255, 255)";
            theTimer = setInterval(function()

```

```
{  
    document.body.style.borderColor =  
getRandomColor();  
}, 1000);  
}  
else  
{  
    clearInterval(theTimer);  
  
    document.body.style.backgroundColor  
= "#";  
}  
isRunning = !isRunning;  
}  
  
toggleColorChange();  
  
document.body.addEventListener('click',  
toggleColorChange);  
}());
```

```
javascript:(
/* Replace Images with a Random Image from
our Array */
function()
{
    const textures =
    [
'https://collegeofscripting.weebly.com/
uploads/6/4/4/8/64482293/wood1.jpg',
'https://collegeofscripting.weebly.com/
uploads/6/4/4/8/64482293/copper.jpg',
'https://collegeofscripting.weebly.com/
uploads/6/4/4/8/64482293/silver.jpg',
'https://collegeofscripting.weebly.com/
uploads/6/4/4/8/64482293/gold.jpg',
];
}

function replaceImages()
{
    const images =
document.getElementsByTagName('img');

    for (let x = 0; x < images.length; x++)

```

```
{  
    let imageIndex = x % textures.length;  
  
    images[x].src = textures[imageIndex];  
  
    images[x].alt = 'Replaced Image';  
}  
}  
  
replacerImages();  
  
}());  
  
/* replaces all images on the current page  
with random images from our array */
```

```
javascript:(  
/* Replace Images with specified Image */  
function()  
{  
    function replacelimages()  
{  
        let images =  
document.getElementsByTagName('img');  
  
        for (let x = 0; x < images.length; x++)  
        {  
            images[x].src =  
'https://collegeofscripting.weebly.com/uploads/  
6/4/4/8/64482293/asphalt.jpg';  
            images[x].alt = 'Asphalt';  
        }  
    }  
    replacelimages();  
}  
);
```

```
javascript:(  
/* Video Pause - Pauses the Video */  
function()  
{  
    function videoPause()  
    {  
        let theVideo =  
document.querySelector('video');  
  
        theVideo.pause();  
    }  
  
    videoPause();  
}  
);
```

/* When Activated, this Bookmarklet will PAUSE the first video found on the page.

This Bookmarklet also works for YouTube and other major Video Websites as well.

We start by first selecting the 0 video on the page. We then use the pause() function to pause the video.

***/**

```
javascript:(  
/* Video Play */  
function()  
{  
    function videoPlay()  
    {  
        let theVideo =  
document.querySelector('video');  
  
        theVideo.play();  
    }  
  
    videoPlay();  
}  
);
```

```
javascript:(  
/* Video Back 2 Seconds */  
function()  
{  
    function videoSkipBackwards()  
    {  
        let theTime =  
document.querySelector('video').currentTime  
+= -2;  
    }  
  
    videoSkipBackwards();  
}  
);
```

```
javascript:(
/* Video Forward 2 Seconds */
function()
{
    function videoSkipForward()
    {
        let theTime =
document.querySelector('video').currentTime
+= 2;
    }

    videoSkipForward();
}

());
```

```
javascript:(  
/* Video Forward 2 Seconds, Keep Activating */  
function()  
{  
    function videoSkipForward()  
    {  
        document.querySelector('video').currentTime  
        += 2;  
    }  
  
    setInterval(videoSkipForward, 1000);  
}  
);
```

```
javascript:(  
/* Video currentTime */  
function()  
{  
    function videocurrentTime()  
    {  
        let time =  
document.querySelector('video').currentTime;  
  
        return time;  
    }  
  
    console.log(videocurrentTime());  
  
    alert(videocurrentTime());  
}  
);
```

```
javascript:(  
/* Video currentTime with round */  
function()  
{  
    function videocurrentTime()  
    {  
        let time =  
document.querySelector('video').currentTime;  
  
        let roundedTime = Math.round(time);  
  
        return roundedTime;  
    }  
  
    console.log(videocurrentTime());  
  
    alert(videocurrentTime());  
}  
);
```

```
javascript:(  
/* Video currentTime using toFixed */  
function()  
{  
    function videocurrentTime()  
    {  
        let time =  
document.querySelector('video').currentTime;  
  
        let formattedTime = time.toFixed(2);  
  
        return formattedTime;  
    }  
  
    console.log(videocurrentTime());  
  
    alert(videocurrentTime());  
}  
);
```

```
javascript:(  
/* Video - Set the currentTime */  
function()  
{  
    function videoSetTime(whichSeconds)  
    {  
        document.querySelector('video').currentTime  
= whichSeconds;  
    }  
  
    videoSetTime(60);  
}  
);
```

```
javascript:(
/* Video - Duration - Total Length in Seconds */
function()
{
    function videoGetDuration()
    {
        let theDuration =
document.querySelector('video').duration;

        return theDuration;
    }

    console.log(videoGetDuration());

    alert(videoGetDuration());
}

());
```

```
javascript:(  
/* Video - loop if true, non loop if false */  
function()  
{  
    function videoLoop(whichLoopSetting)  
    {  
        document.querySelector('video').loop =  
whichLoopSetting;  
    }  
  
    videoLoop(true);  
}  
);
```

```
javascript:(  
/* Video muted if true, unmuted if false */  
function()  
{  
    function videoMute(whichMuteSetting)  
    {  
        document.querySelector('video').muted =  
whichMuteSetting;  
    }  
  
    videoMute(true);  
}  
);
```

```
javascript:(  
/* Video URL - window.location.href */  
function()  
{  
    function videoSource()  
{  
        let theSrc = window.location.href;  
  
        return theSrc;  
    }  
  
    alert(videoSource());  
}  
);
```

```
javascript:(  
/* Video Volume - 0.0 Mute, 1.0 Full */  
function()  
{  
    function videoVolume(whichVolume)  
    {  
        document.querySelector('video').volume =  
whichVolume;  
    }  
  
    videoVolume(0.5);  
}  
);
```

```
javascript:(  
/* Video Volume - Get Volume Level 0.0 to 1.0 */  
function()  
{  
    function videoVolumeGet()  
    {  
        let theSrc =  
document.querySelector('video').volume;  
  
        return theSrc;  
    }  
  
    alert(videoVolumeGet());  
}  
);
```

```
javascript:(  
/* Video Speed to Custom Value */  
/* Set the speed value of the video, such as:  
0.0, 0.25, 0.5, 0.75, 1.00, 1.25, 1.5, 1.75, 2.00,  
20.0, or super slow 0.01 */  
function()  
{  
    function videoSpeedSet(whichSpeed)  
    {  
        document.querySelector('video').playbackRate  
= whichSpeed;  
    }  
  
    videoSpeedSet(0.5);  
}  
());
```

```
javascript:(
/* Video - Custom Speed */
function()
{
    function videoSpeedSet()
    {
        const speedInput = prompt('Enter a
Speed', '0.50');

        const videoSpeed =
parseFloat(speedInput);

        document.querySelector('video').playbackRate
= videoSpeed;
    }

    videoSpeedSet();
}

());
```



**THERE'S ONLY ONE YEAR BEFORE THE
MOTHERSHIP ARRIVES.**

**WE HAVE TO HAVE THE ARMY OF DRONES
READY BEFORE THEN!**

**WITH JAVASCRIPT BOTS RUNNING FULL
TIME, WE MIGHT STAND A CHANCE TO
FEND OFF THE INCOMING WAVES.**

```
javascript:(
/* YouTube - Style Description Border color */
function()
{
    function createBorderAroundVideoInfo()
    {
        let theBorder =
document.querySelector(".style-scope ytd-
watch-metadata");

        theBorder.style.borderStyle = 'solid';
        theBorder.style.borderColor = 'aqua';
    }

    createBorderAroundVideoInfo();
}

());
```

The image shows a YouTube video thumbnail with a black background. At the top, the channel name "Topalian Comic Book Creator Coded in JavaScript" is displayed in white. Below it is the channel logo, which is a circular icon with "CollegeOfScripting.weebly.com" written on it. To the right of the logo, the channel name "ScriptingCollege" and the subscriber count "668 subscribers" are shown. A "Subscribe" button is located next to the channel info. Below the channel section, there is a timestamp "44 views 3 months ago". The main video description reads: "The long awaited JavaScript application that allows you to create your own comic books in your web browser is finally here! You can include video backgrounds, video animations, animated gifs and so much more. In this video, I show you the gallery feature, which lets you choose item ...more". The entire thumbnail is enclosed in a light gray border.



**Jarvis, Stealth is working nicely.
The AI tanks haven't detected me yet.**

True, but there is an anomaly in the stealth field, sir, which will allow you to be seen in about 5 seconds from now.

Anomaly Jarvis? Allows me to be seen?

Stealth is now broken, sir.

```
javascript:(
/* YouTube - Get URL, Title, Description, Date */
function()
{
    function getInfo()
    {
        let nameList =
document.querySelectorAll(".style-scope ytd-
video-primary-info-renderer");

        let theNames = [];

        for (let x = 0; x < nameList.length; x++)
        {
            theNames += nameList[x].textContent;

            theNames += "\n";
        }

        let theTextArea =
document.createElement("textarea");

        theTextArea.style.position = "absolute";
        theTextArea.style.left = 100 + 'px';
        theTextArea.style.top = 200 + 'px';
    }
}
```

```
theTextArea.style.width = 700 + 'px';
theTextArea.style.height = 200 + 'px';
theTextArea.style.zIndex = "1000";
theTextArea.style.border = "solid 2px
rgba(0,0,100,1.0)";

theTextArea.style.background = "white";
theTextArea.style.fontFamily = "arial";
theTextArea.style.fontWeight = "normal";
theTextArea.style.fontSize = "medium";
theTextArea.style.color = "black";
theTextArea.style.textAlign = "center";

theTextArea.setAttribute("readonly",
"true");

theTextArea.value = theNames;

document.body.append(theTextArea);

}

getInfo();

}());
```



Yikes. The AI Tanks have spotted me.

Jarvis: Program #137.

Activate!

Sir, there is a malfunction in the targeting system. You will need to perform all manual aiming.



Jarvis, why didn't you tell me this before the advanced AI tanks got here?

Sorry sir, I will note that in my memory banks for next time.

```
javascript:(  
/* Shows Mouse Position when person clicks  
the screen */  
function()  
{  
    function mousePos()  
{  
        let mouseX = event.pageX;  
        let mouseY = event.pageY;  
  
        let mousePos =  
        "Mouse" + "\n" +  
        "X " + mouseX + "\n" +  
        "Y " + mouseY;  
  
        console.log(mousePos);  
  
        document.title = mousePos;  
    }  
  
    window.addEventListener("click",  
    mousePos, false);  
  
    mousePos();  
}());
```

```
javascript:(  
/* Create a Video Game Player on Any  
Webpage! */  
function()  
{  
    function createPlayer()  
{  
        let player =  
document.createElement("div");  
player.id = "thePlayer";  
player.style.position = "absolute";  
player.style.left = 0;  
player.style.top = 0;  
player.style.width = "50px";  
player.style.height = "50px";  
player.style.zIndex = "15";  
player.style.fontFamily = "exo";  
player.style.fontSize = "20px";  
player.style.fontWeight = "bold";  
player.style.color = "rgb(255, 255, 255)";  
player.style.textAlign = "center";  
player.style.backgroundColor = "rgba(76, 175,  
180, 0.5)";  
document.body.append(player);  
}
```

```
/*----*/
```

```
/* keyboard Letter Codes Being Pressed */
```

```
let keyboard = {};  
keyboard.UP = 87;  
keyboard.DOWN = 83;  
keyboard.LEFT = 65;  
keyboard.RIGHT = 68;
```

```
/*----*/
```

```
/* player's start position and id */
```

```
let ourPlayer =
```

```
{  
    x: 100,  
    y: 300,  
    speedMultiplier: 2,  
    playerId:
```

```
document.getElementById("thePlayer")
```

```
};
```

```
/*----*/
```

```
/* key press detection */
```

```
document.body.onkeyup =
document.body.onkeydown = function (e)
{
    if (e.keyCode == 80) /* letter p */
    {
        ourPlayer.playerId.style.background =
"rgba(0, 175, 80, 0.5)";
        ourPlayer.speedMultiplier = 4;
    }
    if (e.keyCode == 79) /* letter o */
    {
        ourPlayer.playerId.style.background =
"rgba(76, 0, 80, 0.5)";
        ourPlayer.speedMultiplier = 3;
    }
    if (e.keyCode == 73) /* letter i */
    {
        ourPlayer.playerId.style.background =
"rgba(76, 175, 180, 0.5)";
        ourPlayer.speedMultiplier = 2;
    }

/* find out which key was pressed */
let theKeyCode = e.keyCode || e.which;
```

```
    keyboard[theKeyCode] = e.type ==  
'keydown';  
};  
  
/*----*/  
  
/* character movement updating */  
let movePlayer = function (theX, theY)  
{  
    ourPlayer.x += (theX || 0) *  
ourPlayer.speedMultiplier;  
  
    ourPlayer.y += (theY || 0) *  
ourPlayer.speedMultiplier;  
  
    ourPlayer.playerId.style.left = ourPlayer.x  
+ 'px';  
  
    ourPlayer.playerId.style.top = ourPlayer.y  
+ 'px';  
};  
  
/*----*/  
  
/* player controls */
```

```
let sensePlayerMotion = function()
{
    if (keyboard[keyboard.LEFT])
    {
        movePlayer(-1, 0);
    }
    if (keyboard[keyboard.RIGHT])
    {
        movePlayer(1, 0);
    }
    if (keyboard[keyboard.UP])
    {
        movePlayer(0, -1);
    }
    if (keyboard[keyboard.DOWN])
    {
        movePlayer(0, 1);
    }
};
```

```
/*----*/
```

```
/* update the Position of the player */
movePlayer();
```

```
/*----*/  
  
function scrollIt()  
{  
  document.getElementById("thePlayer").scroll  
  intoView(  
    {  
      block: "center",  
      inline: "center"  
    });  
}  
  
let loop001;  
  
function gameLoop()  
{  
  sensePlayerMotion();  
  
  scrollIt();  
  
  loop001 =  
  requestAnimationFrame(gameLoop);  
}  
  
gameLoop();
```

}

createPlayer();

}());

College of Scripting
MUSIC & SCIENCE



Ion weapon is fully charged Sir.

Time to Heat'em up!

WOW!

Jarvis did you modify that since our last test?

No Sir. I agree. It does seem more energized for some reason. I will conduct diagnostics on the systems and report my findings.

```
javascript:(  
/* createElement, append, Make a div, style */  
function()  
{  
    function createInfoDiv()  
{  
        let ourDiv =  
document.createElement("div");  
        ourDiv.style.position = "absolute";  
        ourDiv.style.left = "100px";  
        ourDiv.style.top = "100px";  
        ourDiv.style.padding = "10px";  
        ourDiv.style.zIndex = "1000";  
        ourDiv.style.background = "rgb(0, 0, 0)";  
        ourDiv.style.color = "rgb(0, 255, 255)";  
        ourDiv.innerHTML = "Copper";  
        ourDiv.innerHTML += "<br>";  
        ourDiv.innerHTML += "29";  
        document.body.append(ourDiv);  
    }  
  
    createInfoDiv();  
}  
());
```

```
javascript:(  
/* createElement - id - Right click on the Div  
and choose Inspect */  
function()  
{  
    function createDiv()  
{  
        let ourDiv =  
document.createElement("div");  
ourDiv.id = "ourDiv";  
ourDiv.style.position = "absolute";  
ourDiv.style.left = 100 + "px";  
ourDiv.style.top = 100 + "px";  
ourDiv.style.padding = "2px 2px 2px 2px";  
ourDiv.style.background = "rgb(0, 0, 0)";  
ourDiv.style.fontSize = 30 + "px";  
ourDiv.style.color = "rgb(0, 255, 255)";  
ourDiv.innerHTML = "Right click on this  
div and choose Inspect, to see the id";  
document.body.append(ourDiv);  
}  
  
createDiv();  
}());
```

```
javascript:(
/* createElement, append, Make a Paragraph */
function()
{
    function createParagraph()
    {
        let ourParagraph =
document.createElement("p");
        ourParagraph.style.position = "absolute";
        ourParagraph.style.top = 100 + 'px';
        ourParagraph.style.left = 100 + 'px';
        ourParagraph.innerHTML = "Here is the
text.";
        document.body.append(ourParagraph);
    }
    createParagraph();
}
());
```

```
javascript:(  
/* createElement, append, Make a div, style, url  
new tab */  
function()  
{  
    function createInfoDiv()  
    {  
        let Elements =  
        {  
            name: "copper",  
            number: "29",  
            link:  
"https://en.wikipedia.org/wiki/Copper"  
        };  
  
        let ourDiv =  
document.createElement("div");  
ourDiv.style.position = "absolute";  
ourDiv.style.left = "100px";  
ourDiv.style.top = "100px";  
ourDiv.style.paddingLeft = "10px";  
ourDiv.style.paddingRight = "10px";  
ourDiv.style.paddingBottom = "15px";  
ourDiv.style.paddingTop = "9px";  
ourDiv.style.zIndex = "1000";  
ourDiv.style.borderRadius = "8px";  
    }  
}
```

```
ourDiv.style.background = "rgb(0, 0, 0)";  
ourDiv.style.fontSize = 30 + "px";  
ourDiv.style.color = "rgb(0, 255, 255)";  
ourDiv.style.textAlign = "center";  
ourDiv.innerHTML = Elements.name;  
ourDiv.innerHTML += "<br>";  
ourDiv.innerHTML += Elements.number;  
ourDiv.innerHTML += "<br>";  
ourDiv.innerHTML += '<a href = \'' +  
Elements.link + '\' target = "_blank"> Link </a>';  
document.body.append(ourDiv);  
}  
  
createInfoDiv();  
}());
```



```
javascript:(  
/* createElement, Array Of Objects - link */  
function()  
{  
    function createInfoDiv()  
{  
        let myRecord =  
        [  
            {  
                name: "Key",  
                weight: 140,  
                link: "https://google.com/news"  
            },  
            {  
                name: "Donald",  
                weight: 160,  
                link: "https://google.com"  
            }  
        ];  
    };  
}
```

```
let ourDiv =  
document.createElement("div");  
ourDiv.style.position = "absolute";  
ourDiv.style.left = "100px";  
ourDiv.style.top = "100px";  
ourDiv.style.width = "100px";
```

```
ourDiv.style.paddingLeft = "10px";
ourDiv.style.paddingRight = "10px";
ourDiv.style.paddingBottom = "15px";
ourDiv.style.paddingTop = "9px";
ourDiv.style.borderRadius = "8px";
ourDiv.style.background = "rgb(0, 0, 0)";
ourDiv.style.zIndex = "1000";
ourDiv.style.fontSize = 30 + "px";
ourDiv.style.color = "rgb(0, 255, 255)";
ourDiv.style.textAlign = "center";
ourDiv.innerHTML = myRecord[0].name;
ourDiv.innerHTML += "<br>";
ourDiv.innerHTML +=
myRecord[0].weight;
ourDiv.innerHTML += "<br>";
ourDiv.innerHTML += '<a href = \'' +
myRecord[0].link + '\' target = "_blank"> Link
</a>';

document.body.append(ourDiv);
}

createInfoDiv();

}());
```

```
/*
```



We make an Array of Objects that we named myRecord

The 0 entry of the myRecord array is Key.

**The 1 entry of the myRecord array is Donald.
In the above script, we only display one record, which is the entry that has the name Key.**

**To display the first entry name we use
myRecord[0].name**

**To display the first entry weight we use
myRecord[0].weight**

**To display the second entry name we use
myRecord[1].name**

**To display the second entry weight we use
myRecord[1].weight**

```
*/
```

```
javascript:(  
/* createElement, Array of Objects - Show All */  
function()  
{  
    function createInfoDiv()  
{  
        let myRecord =  
        [  
            {  
                name: "Key",  
                weight: 140,  
                link: "https://google.com/news"  
            },  
            {  
                name: "Donald",  
                weight: 160,  
                link: "https://google.com"  
            }  
        ];  
  
        /*----*/  
    }  
}
```

```
    let ourDiv =  
    document.createElement("div");  
    ourDiv.style.position = "absolute";  
    ourDiv.style.left = "100px";
```

```
ourDiv.style.top = "100px";
ourDiv.style.paddingLeft = "10px";
ourDiv.style.paddingRight = "10px";
ourDiv.style.paddingBottom = "2px";
ourDiv.style.paddingTop = "2px";
ourDiv.style.borderRadius = "8px";
ourDiv.style.background = "rgb(0, 0, 0)";
ourDiv.style.zIndex = "1000";
ourDiv.style.fontSize = 30 + "px";
ourDiv.style.color = "rgb(0, 255, 255)";
ourDiv.style.textAlign = "right";
document.body.append(ourDiv);
```

```
let output = "";
```

```
for (let x = 0; x < myRecord.length; x++)
{
```

```
    output += "<hr>";
```

```
    output += myRecord[x].name;
```

```
    output += " ";
```

```
    output += myRecord[x].weight;
```

```
    output += " ";
```

```
    output += '<a href = \'' +
```

```
myRecord[x].link + '\' target = "_blank"> Link
</a>';
}
```

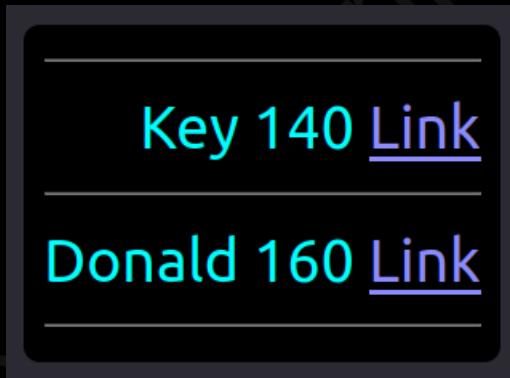
```
output += '<hr>';

ourDiv.innerHTML = output;

}

createInfoDiv();

}());
```



```
/*  
Creates a New div on the page with style & url  
link of an array of objects, displaying all  
entries
```

We loop through the entries of the myRecords array to display all of them at once. The for loop will only continue for as many entries that are found. In this case, there are only two entries.

We display them all of the entries on a div that we have made using createElement. This div that we create is very useful technology.

A person can make RPG Games, Periodic Tables, Pop Ups, Ads, Additional Info Boxes, Notifications, and so much more, using just this one script! */

```
javascript:(  
/* createElement, Make a Button */  
function()  
{  
    function textMessage(whichText)  
    {  
        alert(whichText);  
    }  
  
    function createMessage(whichText)  
    {  
        let ourButton =  
document.createElement("button");  
        ourButton.style.position = "absolute";  
        ourButton.style.left = "100px";  
        ourButton.style.top = "100px";  
        ourButton.style.padding = "2px";  
        ourButton.style.zIndex = "1000";  
        ourButton.style.background = "rgb(0, 0,  
0)";  
        ourButton.style.fontSize = 22 + "px";  
        ourButton.style.color = "rgb(255, 255,  
255)";  
        ourButton.innerHTML = "Greeting";  
    }  
}
```

```
ourButton.onmouseover = function()
{
    ourButton.style.color = "rgb(0, 255,
255)";
};

ourButton.onmouseout = function()
{
    ourButton.style.color = "rgb(255, 255,
255)";
};

ourButton.onclick = function()
{
    textMessage(whichText);
};

document.body.append(ourButton);

}

createMessage("Hi Everyone");

}());
```



Jarvis, use the AI quickly to find out why the auto aiming system is down.

Sir it is not advisable to run the AI outside of the containment box.

Jarvis, the radar is showing 7000 more tanks in the distance. Just activate the AI fast and fix the issue.



It has already begun.

Stark is a fool after all. He took the bait.

**The JavaScript A.I. Language will take only
days to destroy all life on the planet.**

The cycle will finally be over.

```
javascript:(
/* Scene - Position - Get Current Position of the
square object by left clicking it */
function()
{
    let horizon = document.createElement('div');
    horizon.style.position = 'absolute';
    horizon.style.left = '0px';
    horizon.style.top = '0px';
    horizon.style.width = '100%';
    horizon.style.height = '50%';
    horizon.style.backgroundColor = 'rgb(0, 100,
200)';
    document.body.append(horizon);

/*----*/
    let grass = document.createElement('div');
    grass.style.position = 'absolute';
    grass.style.left = '0px';
    grass.style.bottom = '0px';
    grass.style.width = '100%';
    grass.style.height = '50%';
    grass.style.backgroundColor = 'rgb(0, 120,
0)';
    document.body.append(grass);
}
```

```
/*----*/  
  
let road = document.createElement('div');  
road.style.position = 'absolute';  
road.style.left = '30%';  
road.style.bottom = '0%';  
road.style.width = '20%';  
road.style.height = '100%';  
road.style.clipPath = 'polygon(0 100%, 50%  
50%, 100% 100%)';  
road.style.backgroundColor = 'rgb(0, 20, 0)';  
document.body.append(road);
```

```
/*----*/
```

```
let object001 =  
document.createElement('div');  
object001.style.position = 'absolute';  
object001.style.left = '400px';  
object001.style.top = '500px';  
object001.style.width = '20px';  
object001.style.height = '20px';  
object001.style.backgroundColor = 'tan';  
object001.style.cursor = 'pointer';  
object001.style.zIndex = '10000';
```

```
object001.onclick = function(event)
{
    /* get position */
    let objectRect =
object001.getBoundingClientRect();

    console.log('X: ' + objectRect.x + ', Y: ' +
objectRect.y);

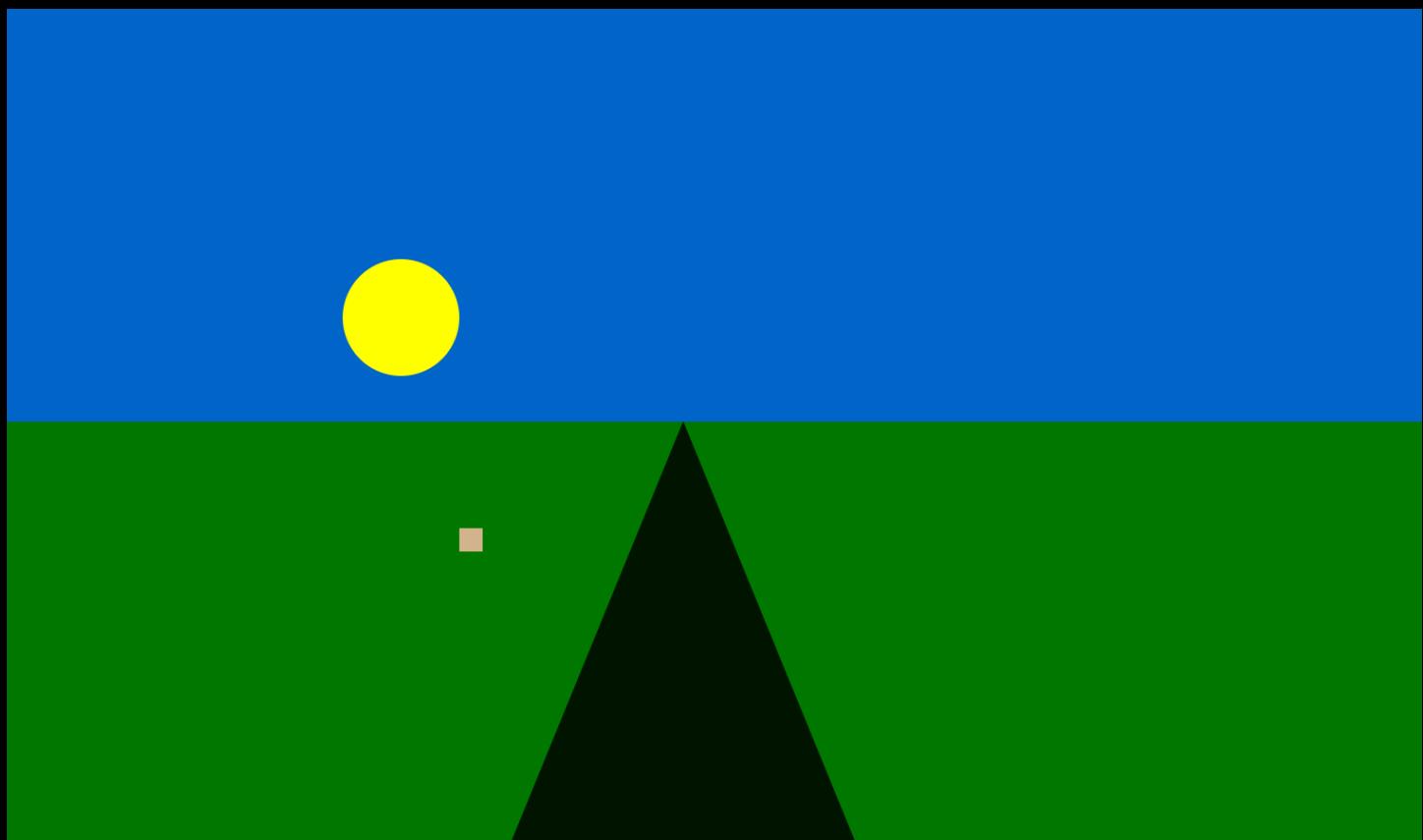
    alert('X: ' + objectRect.x + ', Y: ' +
objectRect.y);
};

document.body.append(object01);

/*----*/
let sun = document.createElement('div');
sun.style.position = 'absolute';
sun.style.left = '300px';
sun.style.bottom = '400px';
sun.style.width = '100px';
sun.style.height = '100px';
sun.style.borderRadius = "50%";
sun.style.backgroundColor = 'yellow';
```

```
sun.style.cursor = 'pointer';
sun.style.zIndex = '10000';
document.body.append(sun);

}());
```



```
/*
Result:
X: 400, Y: 500
*/
```

```
javascript:(  
/* createElement - Get link textContent from a  
Webpage, remove element on right click */  
function()  
{  
    function createInfoDiv()  
{  
        let report = "";  
  
        let theLinks =  
document.getElementsByTagName("a");  
  
        for (let x = 0; x < theLinks.length; x++)  
        {  
            report += '<a href = "' + theLinks[x] + '"  
target = "_blank">' + theLinks[x].textContent +  
'</a>';  
  
            report += "<hr>";  
        }  
  
        let ourDiv =  
document.createElement("div");  
        ourDiv.id = "theDiv";  
        ourDiv.style.position = "absolute";
```

```
ourDiv.style.left = "100px";
ourDiv.style.top = "100px";
ourDiv.style.width = "300px";
ourDiv.style.height = "200px";
ourDiv.style.paddingLeft = "10px";
ourDiv.style.paddingRight = "10px";
ourDiv.style.paddingBottom = "5px";
ourDiv.style.paddingTop = "5px";
ourDiv.style.borderRadius = "8px";
ourDiv.style.background = "rgb(0, 0, 0)";
ourDiv.style.zIndex = "1000";
ourDiv.style.fontSize = 22 + "px";
ourDiv.style.color = "rgb(0, 255, 255)";
ourDiv.style.overflowY = "scroll";

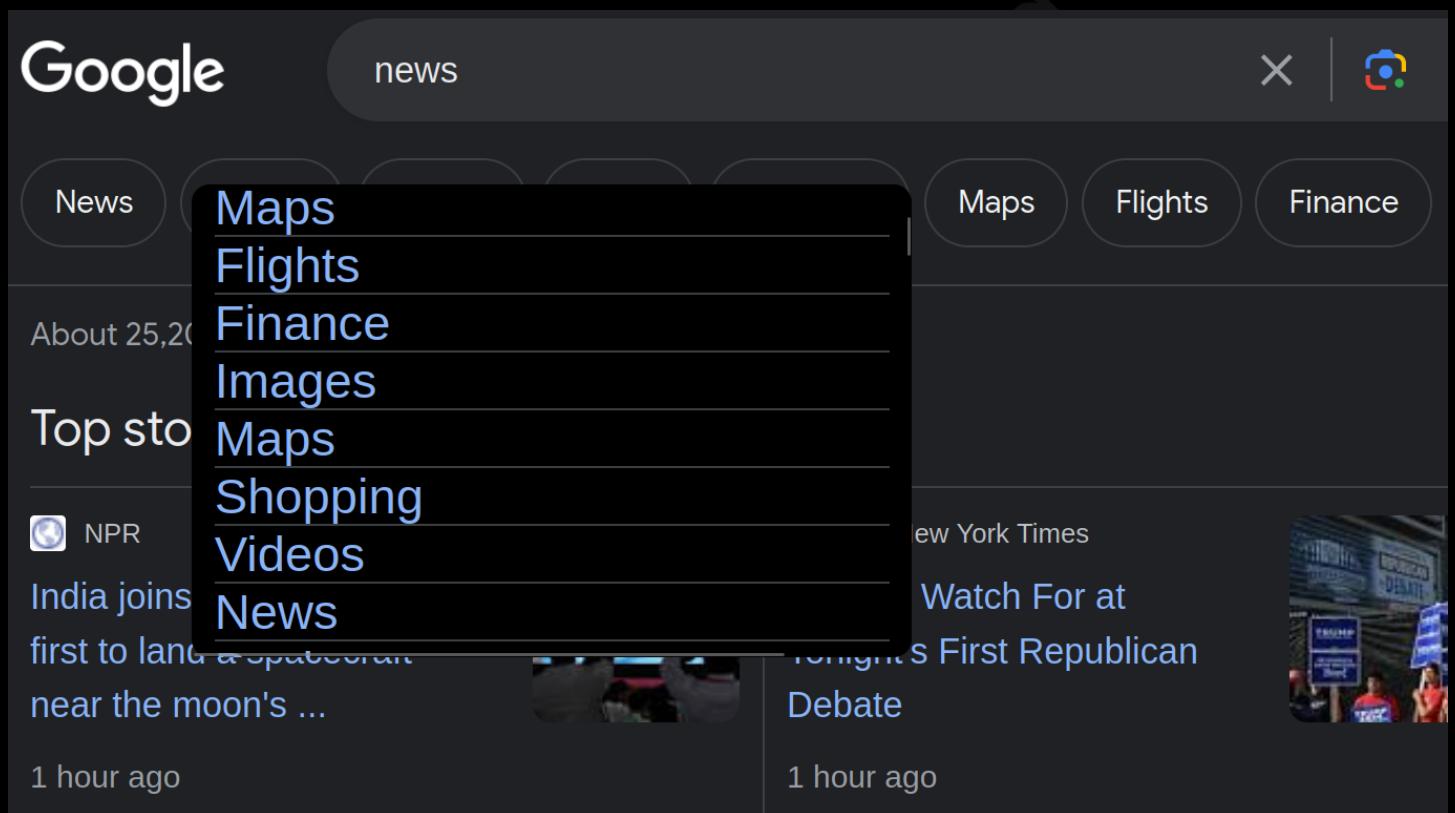
ourDiv.innerHTML = report;

ourDiv.oncontextmenu = function()
{
document.getElementById("theDiv").remove();
};

document.body.append(ourDiv);
}
```

```
createInfoDiv();  
});
```

/* For example: we can search Google for the word News and then activate our script */



```
/*  
The div is created on the page and the links of  
the page are shown in the div and are  
clickable.  
The div is also scrollable.  
*/
```

```
/*
```

Choose the syntax style that you like using more:

```
report += "<a href = ' " + theLinks[x] + " ' target = '_blank'>" + theLinks[x].textContent + "</a>";
```

```
report += '<a href = " ' + theLinks[x] + ' " target = "_blank">' + theLinks[x].textContent + '</a>';
```

```
report += '<a href = \' + theLinks[x] + '\'' target = "_blank"> '+theLinks[x].textContent+' </a>';
```

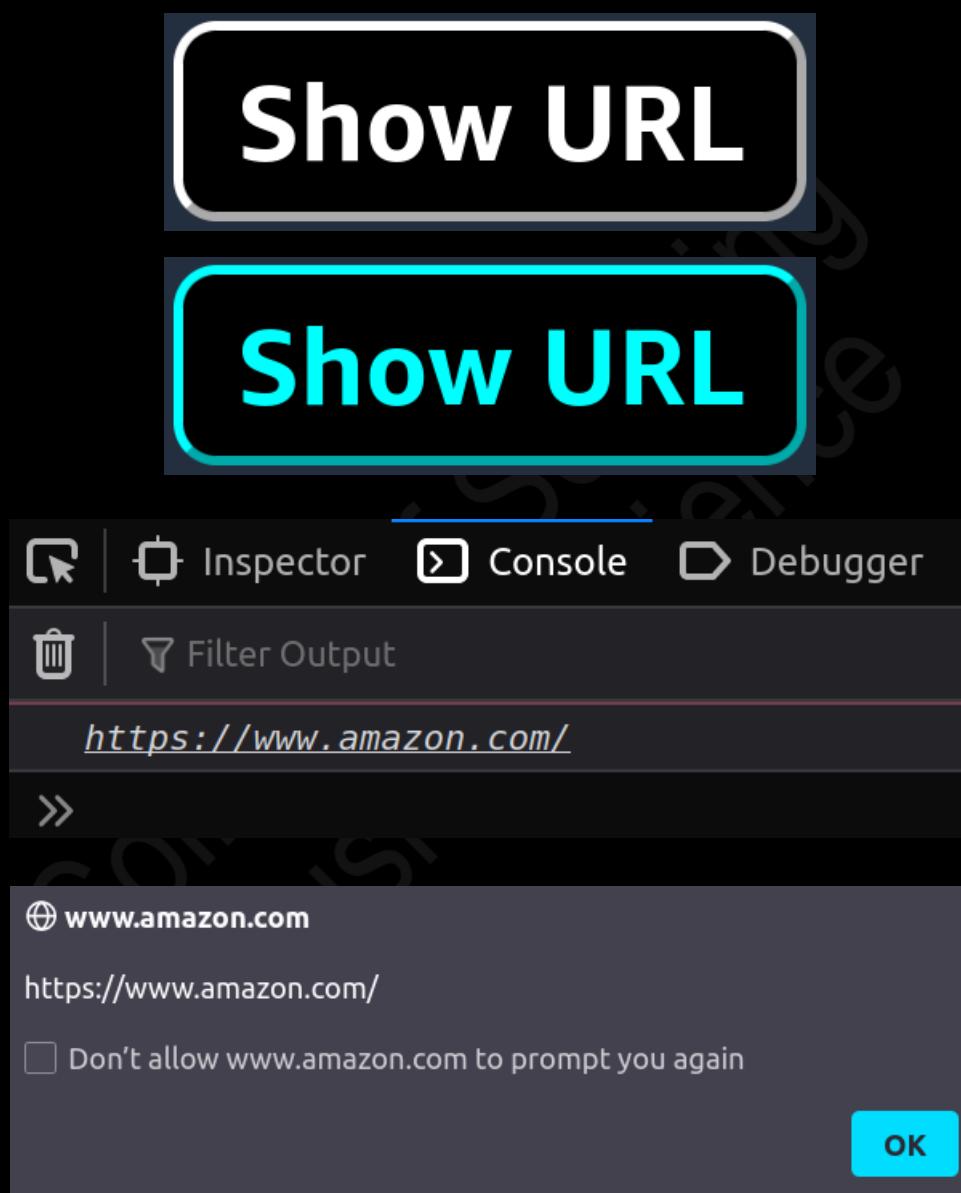
```
report += `<a href = "${theLinks[x]}" target = "_blank">${theLinks[x].textContent}</a>`;
```

```
*/
```

```
javascript:(  
/* createElement - Get URL of Page when  
button is clicked - onmouseover, onmouseout  
function()  
{  
    function showUrl()  
{  
        let ourButton =  
document.createElement("button");  
        ourButton.style.position = "fixed";  
        ourButton.style.right = 5 + "px";  
        ourButton.style.top = 5 + "px";  
        ourButton.style.borderRadius = 8 + "px";  
        ourButton.style.paddingLeft = 10 + "px";  
        ourButton.style.paddingRight = 10 + "px";  
        ourButton.style.paddingBottom = 5 +  
"px";  
        ourButton.style.paddingTop = 5 + "px";  
        ourButton.style.zIndex = "1000";  
        ourButton.style.background = "rgb(0, 0,  
0)";  
        ourButton.style.fontSize = 20 + "px";  
        ourButton.style.fontWeight = "bold";  
    }  
}
```

```
ourButton.style.color = "rgb(255, 255,  
255)";  
  
ourButton.onclick = function()  
{  
    console.log(window.location.href);  
    alert(window.location.href);  
};  
  
ourButton.onmouseover = function()  
{  
    ourButton.style.borderColor = "aqua";  
    ourButton.style.color = "aqua";  
};  
  
ourButton.onmouseout = function()  
{  
    ourButton.style.borderColor = "white";  
    ourButton.style.color = "white";  
};  
  
ourButton.innerHTML = "Show URL";  
  
document.body.append(ourButton);  
}
```

```
showUrl();  
});
```



```
/* onmouseover the button changes style,  
onmouseout the button changes style again.  
onclick it shows the url of the page in a  
console message and alert message box */
```

```
javascript:(
/* createElement, Video pause button */
function()
{
    function videoPause()
    {
        let ourButton =
document.createElement("button");
        ourButton.id = "theButton";
        ourButton.style.position = "absolute";
        ourButton.style.left = "100px";
        ourButton.style.top = "100px";
        ourButton.style.paddingLeft = 10 + "px";
        ourButton.style.paddingRight = 10 + "px";
        ourButton.style.paddingTop = 5 + "px";
        ourButton.style.paddingBottom = 5 +
"px";
        ourButton.style.borderRadius = 8 + "px";
        ourButton.style.zIndex = "1000";
        ourButton.style.background = "rgb(0, 0,
0)";
        ourButton.style.fontSize = 20 + "px";
        ourButton.style.fontWeight = "bold";
        ourButton.style.color = "rgb(255, 255,
255)";
    }
}
```

```
ourButton.innerHTML = "Pause Button";  
  
ourButton.onmouseover = function()  
{  
    ourButton.style.color = "rgb(0, 255,  
255)";  
};  
  
ourButton.onmouseout = function()  
{  
    ourButton.style.color = "rgb(255, 255,  
255)";  
};  
  
ourButton.onclick = function()  
{  
    let theVideo =  
document.querySelectorAll("video");  
  
    theVideo.pause();  
};  
  
document.body.append(ourButton);  
  
}
```

```
videoPause();  
});
```

/* When we have a video playing in our browser we can pause it using this button. */

```
javascript:(
/* createElement, append, Video, Play, Pause
Buttons */
function()
{
    function createPausePlayButtons()
    {
        let playButton =
document.createElement("button");
        playButton.id = "playButton";
        playButton.style.position = "absolute";
        playButton.style.left = 100 + "px";
        playButton.style.top = 100 + "px";
        playButton.style.paddingLeft = 10 + "px";
        playButton.style.paddingRight = 10 +
"px";
        playButton.style.paddingTop = 5 + "px";
        playButton.style.paddingBottom = 5 +
"px";
        playButton.style.borderRadius = 8 + "px";
        playButton.style.zIndex = 1000;
        playButton.style.background = "rgb(0, 0,
0)";
        playButton.style.fontSize = 20 + "px";
        playButton.style.fontWeight = "bold";
    }
}
```

```
playButton.style.color = "rgb(255, 255,  
255)";  
playButton.innerHTML = "Play Button";  
  
playButton.onmouseover = function()  
{  
    playButton.style.color = "rgb(0, 255,  
255)";  
};  
  
playButton.onmouseout = function()  
{  
    playButton.style.color = "rgb(255, 255,  
255)";  
};  
  
playButton.onclick = function()  
{  
    let theVideo =  
document.querySelectorAll("video");  
  
    theVideo.play();  
};  
  
document.body.append(playButton);
```

```
/*----*/  
  
let pauseButton =  
document.createElement("button");  
pauseButton.id = "pauseButton";  
pauseButton.style.position = "absolute";  
pauseButton.style.left = 100 + "px";  
pauseButton.style.top = 150 + "px";  
pauseButton.style.paddingLeft = 10 +  
"px";  
pauseButton.style.paddingRight = 10 +  
"px";  
pauseButton.style.paddingTop = 5 + "px";  
pauseButton.style.paddingBottom = 5 +  
"px";  
pauseButton.style.borderRadius = 8 +  
"px";  
pauseButton.style.zIndex = 1000;  
pauseButton.style.background = "rgb(0, 0,  
0)";  
pauseButton.style.fontSize = 20 + "px";  
pauseButton.style.fontWeight = "bold";  
pauseButton.style.color = "rgb(255, 255,  
255)";
```

```
pauseButton.innerHTML = "Pause  
Button";
```

```
pauseButton.onmouseover = function()  
{  
    pauseButton.style.color = "rgb(0, 255,  
255)";  
};  
  
pauseButton.onmouseout = function()  
{  
    pauseButton.style.color = "rgb(255, 255,  
255)";  
};  
  
pauseButton.onclick = function()  
{  
    let theVideo =  
document.querySelectorAll("video");  
  
    theVideo.pause();  
};  
  
document.body.append(pauseButton);
```

```
    }  
  
    createPausePlayButtons();  
  
});
```

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```
javascript:(
/* createElement Video, play, pause, back,
forward, Mute, UnMute */
function()
{
    function createVideoControls()
    {
        let thePaddingLeft = 10;
        let thePaddingRight = 10;
        let thePaddingTop = 5;
        let thePaddingBottom = 5;
        let theMargin = 1;
        let theBorderRadius = 8;
        let theZIndex = 1000;
        let theFontSize = 16;
        let theTextColor = "rgb(255, 255, 255)";
        let theBackgroundColor = "rgba(0, 0, 0,
0.3)";
        let theBorderColor = "rgba(255, 255, 255,
0.3)";
        let theFontWeight = "bold";

        /*----*/
    }
}
```

```
let mainDiv =  
document.createElement("div");  
mainDiv.style.position = "absolute";  
mainDiv.style.left = 5 + "px";  
mainDiv.style.top = 70 + "px";  
mainDiv.style.display = "flex";  
mainDiv.style.flexDirection = "column";  
document.body.append(mainDiv);
```

/*----*/

```
let playButton =  
document.createElement("button");  
playButton.id = "playButton";  
playButton.style.paddingLeft =  
thePaddingLeft + "px";  
playButton.style.paddingRight =  
thePaddingRight + "px";  
playButton.style.paddingTop =  
thePaddingTop + "px";  
playButton.style.paddingBottom =  
thePaddingBottom + "px";  
playButton.style.margin = theMargin +  
"px";
```

```
playButton.style.borderRadius =  
theBorderRadius + "px";  
playButton.style.borderColor =  
theBorderColor;  
playButton.style.zIndex = theZIndex;  
playButton.style.backgroundColor =  
theBackgroundColor;  
playButton.style.fontSize = theFontSize +  
"px";  
playButton.style.fontWeight =  
theFontWeight;  
playButton.style.color = theTextColor;  
playButton.innerHTML = "Play";  
  
playButton.onmouseover = function()  
{  
    playButton.style.color = "rgb(0, 255,  
255)";  
};  
  
playButton.onmouseout = function()  
{  
    playButton.style.color = theTextColor;  
};
```

```
playButton.onclick = function()
{
    let theVideo =
document.querySelector("video");

    theVideo.play();
};

mainDiv.append(playButton);

/*----*/

let pauseButton =
document.createElement("button");
pauseButton.id = "pauseButton";
pauseButton.style.paddingLeft =
thePaddingLeft + "px";
pauseButton.style.paddingRight =
thePaddingRight + "px";
pauseButton.style.paddingTop =
thePaddingTop + "px";
pauseButton.style.paddingBottom =
thePaddingBottom + "px";
pauseButton.style.margin = theMargin +
"px";
```

```
pauseButton.style.borderRadius =  
theBorderRadius + "px";  
pauseButton.style.borderColor =  
theBorderColor;  
pauseButton.style.zIndex = theZIndex;  
pauseButton.style.backgroundColor =  
theBackgroundColor;  
pauseButton.style.fontSize = theFontSize  
+ "px";  
pauseButton.style.fontWeight =  
theFontWeight;  
pauseButton.style.color = theTextColor;  
pauseButton.innerHTML = "Pause";  
  
pauseButton.onmouseover = function()  
{  
    pauseButton.style.color = "rgb(0, 255,  
255)";  
};  
  
pauseButton.onmouseout = function()  
{  
    pauseButton.style.color = theTextColor;  
};
```

```
pauseButton.onclick = function()
{
    let theVideo =
document.querySelector("video");

theVideo.pause();
};

mainDiv.append(pauseButton);

/*----*/

let backButton =
document.createElement("button");
backButton.id = "backButton";
backButton.style.paddingLeft =
thePaddingLeft + "px";
backButton.style.paddingRight =
thePaddingRight + "px";
backButton.style.paddingTop =
thePaddingTop + "px";
backButton.style.paddingBottom =
thePaddingBottom + "px";
backButton.style.margin = theMargin +
"px";
```

```
backButton.style.borderRadius =
theBorderRadius + "px";
    backButton.style.borderColor =
theBorderColor;
    backButton.style.zIndex = theZIndex;
    backButton.style.background =
theBackgroundColor;
    backButton.style.fontSize = theFontSize +
"px";
    backButton.style.fontWeight =
theFontWeight;
    backButton.style.color = theTextColor;
    backButton.innerHTML = "Back";

backButton.onmouseover = function()
{
    backButton.style.color = "rgb(0, 255,
255)";
};

backButton.onmouseout = function()
{
    backButton.style.color = theTextColor;
};
```

```
backButton.onclick = function()
{
    let theVideo =
document.querySelector("video");

    theVideo.currentTime += -2;
};

mainDiv.append(backButton);

/*----*/

let forwardButton =
document.createElement("button");
forwardButton.id = "forwardButton";
forwardButton.style.paddingLeft =
thePaddingLeft + "px";
forwardButton.style.paddingRight =
thePaddingRight + "px";
forwardButton.style.paddingTop =
thePaddingTop + "px";
forwardButton.style.paddingBottom =
thePaddingBottom + "px";
forwardButton.style.margin = theMargin +
"px";
```

```
forwardButton.style.borderRadius =  
theBorderRadius + "px";  
forwardButton.style.borderColor =  
theBorderColor;  
forwardButton.style.zIndex = theZIndex;  
forwardButton.style.background =  
theBackgroundColor;  
forwardButton.style.fontSize =  
theFontSize + "px";  
forwardButton.style.fontWeight =  
theFontWeight;  
forwardButton.style.color = theTextColor;  
forwardButton.innerHTML = "Forward";  
  
forwardButton.onmouseover = function()  
{  
    forwardButton.style.color = "rgb(0, 255,  
255)";  
};  
  
forwardButton.onmouseout = function()  
{  
    forwardButton.style.color =  
theTextColor;  
};
```

```
forwardButton.onclick = function()
{
    let theVideo =
document.querySelector("video")[0];

    theVideo.currentTime += 2;
};

mainDiv.append(forwardButton);

/*----*/

let speedButton =
document.createElement("button");
speedButton.id = "speedButton";
speedButton.style.paddingLeft =
thePaddingLeft + "px";
    speedButton.style.paddingRight =
thePaddingRight + "px";
    speedButton.style.paddingTop =
thePaddingTop + "px";
    speedButton.style.paddingBottom =
thePaddingBottom + "px";
```

```
speedButton.style.margin = theMargin +
"px";
    speedButton.style.borderRadius =
theBorderRadius + "px";
    speedButton.style.borderColor =
theBorderColor;
    speedButton.style.zIndex = theZIndex;
    speedButton.style.background =
theBackgroundColor;
    speedButton.style.fontSize = theFontSize
+ "px";
    speedButton.style.fontWeight =
theFontWeight;
    speedButton.style.color = theTextColor;
    speedButton.innerHTML = "Speed";

speedButton.onmouseover = function()
{
    speedButton.style.color = "rgb(0, 255,
255)";
};

speedButton.onmouseout = function()
{
    speedButton.style.color = theTextColor;
```

```
};

speedButton.onclick = function()
{
    let video =
document.querySelector("video");

    let speedInput = prompt("Enter speed",
 $"")$ );

    video.playbackRate =
parseFloat(speedInput);
};

mainDiv.append(speedButton);

/*----*/
}

let muteButton =
document.createElement("button");
    muteButton.id = "muteButton";
    muteButton.style.paddingLeft =
thePaddingLeft + "px";
    muteButton.style.paddingRight =
thePaddingRight + "px";
```

```
    muteButton.style.paddingTop =  
thePaddingTop + "px";  
    muteButton.style.paddingBottom =  
thePaddingBottom + "px";  
    muteButton.style.margin = theMargin +  
"px";  
    muteButton.style.borderRadius =  
theBorderRadius + "px";  
    muteButton.style.borderColor =  
theBorderColor;  
    muteButton.style.zIndex = theZIndex;  
    muteButton.style.background =  
theBackgroundColor;  
    muteButton.style.fontSize = theFontSize +  
"px";  
    muteButton.style.fontWeight =  
theFontWeight;  
    muteButton.style.color = theTextColor;  
    muteButton.innerHTML = "Mute";  
  
    muteButton.onmouseover = function()  
{  
        muteButton.style.color = "rgb(0, 255,  
255)";  
};
```

```
muteButton.onmouseout = function()
{
    muteButton.style.color = theTextColor;
};

muteButton.onclick = function()
{
    document.querySelector("video").muted
= true;
};

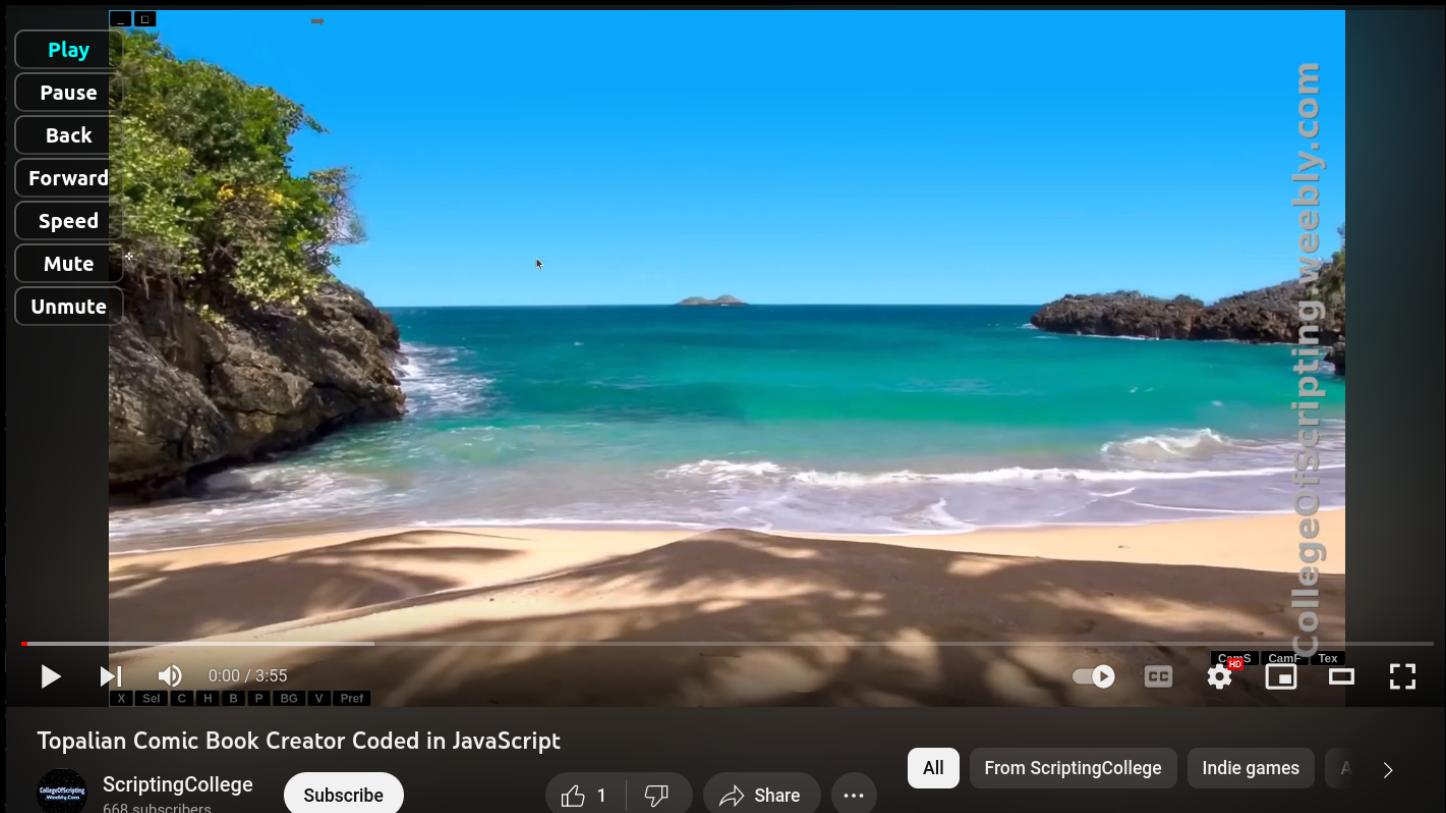
mainDiv.append(muteButton);

/*----*/

let unmuteButton =
document.createElement("button");
unmuteButton.id = "unmuteButton";
unmuteButton.style.paddingLeft =
thePaddingLeft + "px";
    unmuteButton.style.paddingRight =
thePaddingRight + "px";
        unmuteButton.style.paddingTop =
thePaddingTop + "px";
```

```
unmuteButton.style.paddingBottom =  
thePaddingBottom + "px";  
    unmuteButton.style.margin = theMargin +  
"px";  
        unmuteButton.style.borderRadius =  
theBorderRadius + "px";  
        unmuteButton.style.borderColor =  
theBorderColor;  
        unmuteButton.style.zIndex = theZIndex;  
        unmuteButton.style.background =  
theBackgroundColor;  
        unmuteButton.style.fontSize =  
theFontSize + "px";  
        unmuteButton.style.fontWeight =  
theFontWeight;  
        unmuteButton.style.color = theTextColor;  
        unmuteButton.innerHTML = "Unmute";  
  
unmuteButton.onmouseover = function()  
{  
    unmuteButton.style.color = "rgb(0, 255,  
255)";  
};  
  
unmuteButton.onmouseout = function()
```

```
{  
    unmuteButton.style.color =  
theTextColor;  
};  
  
unmuteButton.onclick = function()  
{  
  
document.querySelector("video").muted =  
false;  
};  
  
mainDiv.append(unmuteButton);  
}  
  
createVideoControls();  
}());
```



```
javascript:(
/* Show elements of a certain class name on
https://CollegeOfScripting.weebly.com */
function()
{
    function showData()
    {
        let nameList =
document.querySelectorAll(".buttonStyle");

        let theNames = [];

        for (let x = 0; x < nameList.length; x++)
        {
            nameList[x].style.borderColor = "rgb(0,
255, 255)";

            theNames += nameList[x].textContent;

            theNames += "\n";
        }

        return theNames.toString();
    }
}
```

```
console.log(showData());  
  
alert(showData());  
  
})();
```

```
/*
```

This Bookmarklet is designed to work ONLY on one Website.

**Go to <https://CollegeOfScripting.weebly.com>
Right Click on the buttons, such as the
JavaScript button and then
Choose Inspect Element**

We see that the Element has a css style class called .buttonStyle

**We use the dot syntax before the class name.
The css style class name is .buttonStyle**

**Inspecting an Element
After Right Clicking on the Button and
choosing Inspect Element, the Inspector**

Opens and allows us to see the name of the class of that Button.

In this case, the buttons of this Weebly Website have a class called buttonStyle

Thus, we simply use that class name, when we want to reference only elements that use that class. This allows us to examine any webpage and inspect any element to find their class name, which therefore allows us the ability to reference any elements on the page that use that class.

***/**

Inspecting an Element

The screenshot shows a browser window with the URL <https://collegeofscripting.weebly.com>. The page content includes a blue header bar with the text "JavaScript Tutorials". Below it, there is descriptive text about JavaScript bookmarklets. At the bottom, there is a call-to-action button labeled "Click on the Link below to find out more about". The browser's developer tools are open, specifically the "Inspector" tab, which is highlighted with a blue border. The "Elements" panel shows the DOM structure of the page. A button in the DOM tree has the class "buttonStyle" applied to it. The "event" label is visible next to the button node in the tree.

After Right Clicking on the button and choosing Inspect Element, the Inspector Opens and shows the name of the class of that button. In this case, the button of this Weebly Website has a class named buttonStyle



Sir, the sun.

Jarvis, what about the sun?

**Sir, the sun is hitting the Earth with no magnetosphere between the two.
Something has destroyed the magnetosphere Sir.**

Jarvis, monitor the sun every moment and provide me with real time updates.

```
javascript:(
/* Solar Wind Speed -
https://www.swpc.noaa.gov/ */
function()
{
    function getSolarWindSpeed()
    {
        let solarWindSpeed =
document.querySelector("#WindSpeed").textC
ontent;

        return solarWindSpeed;
    }

    function showData()
    {
        let solarWindSpeed = "Solar Wind Speed:
" + getSolarWindSpeed() + " km/second";

        console.log(solarWindSpeed);

        alert(solarWindSpeed);
    }

    showData();
}
```

```
});
```



Solar Wind Speed: **354** km/sec

Solar Wind Magnetic Fields: Bt **6** nT, Bz **-1** nT

Inspector Console Debugger Network Style Editor »

search HTML

```
<li>
<span class="summary-field-label">Solar Wind Speed:</span>
<span id="WindSpeed" class="summary-field-value">354</span>
km/sec
</li>
```



```
/*
```

Solar Wind Speed: 354 km/second

When we go to <https://www.swpc.noaa.gov> and right click on the Solar Wind Speed and choose Inspect, we find out many things about the element, including the id, which we use in this script to get the `textContent` of that id.

```
*/
```

```
javascript:(  
/* Solar Wind Speed -  
https://www.swpc.noaa.gov - Timer */  
function()  
{  
    function getSolarWindSpeed()  
{  
        let solarWindSpeed =  
document.querySelector("#WindSpeed").textC  
ontent;  
  
        return solarWindSpeed;  
    }  
  
    function showData()  
{  
        let solarWindSpeed = "Solar Wind Speed:  
" + getSolarWindSpeed() + " km/second";  
  
        console.log(solarWindSpeed);  
    }  
  
    showData();  
  
    let theTimer = setInterval(function()  
{  
    }  
}, 1000);
```

```
{  
    showData();  
}, 60 * 1000);
```

```
})();
```

```
/*
```

We go to <https://www.swpc.noaa.gov> and then activate this script.

This script will keep getting the Solar Wind Speed from the element id "WindSpeed" textContent.

We use a setInterval timer to get the data at a specified rate again and again.

In this way we are monitoring the Solar Wind Speed.

```
*/
```

```
javascript:(
/* Solar Wind Speed -
https://www.swpc.noaa.gov - Timer - Array */
function()
{
    let solarWindArray = [];

    function getSolarWindSpeed()
    {
        let solarWindSpeed =
document.querySelector("#WindSpeed").textContent;

        let date = new Date();

        let dateLocal = date.toLocaleString();

        return dateLocal + " - Solar Wind Speed: "
+ solarWindSpeed + " km/second";
    }

    /* push data into the array */
    solarWindArray.push(getSolarWindSpeed());

    console.log(JSON.stringify(solarWindArray));
}
```

```
let theTimer = setInterval(function()
{
    /* push data into the array on each
iteration */
    solarWindArray.push(getSolarWindSpeed());

    console.log(JSON.stringify(solarWindArray));

}, 60 * 1000);

}());
```

/*
When activated on <https://www.swpc.noaa.gov> this script will get the Solar Wind Speed every 1 minute and add the solar wind speed to the array, in addition to the date and time.

The first time that the script gathers the solar wind speed it looks like this:
["8/28/2023, 6:54:56 AM - Solar Wind Speed: 327 km/second"]

The second time that the script gathers the solar wind speed it looks like this:

["8/28/2023, 6:54:17 AM - Solar Wind Speed: 327 km/second", "8/28/2023, 6:55:17 AM - Solar Wind Speed: 325 km/second"]

***/**

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```
javascript:(
/* Solar Wind Speed -
https://www.swpc.noaa.gov - Timer - Array of
Objects -*/
function()
{
    let solarWindArray = [];

    function getSolarWindSpeed()
    {
        let solarWindSpeed =
document.querySelector("#WindSpeed").textC
ontent;

        let date = new Date();

        let dateLocal = date.toLocaleString();

        return {
            date: dateLocal,
            speed: solarWindSpeed
        };
    }

    /* push data into the array */
    solarWindArray.push(getSolarWindSpeed());
}
```

```
console.log(JSON.stringify(solarWindArray));  
  
let theTimer = setInterval(function()  
{  
    /* push data into the array on each  
iteration */  
    solarWindArray.push(getSolarWindSpeed());  
  
    console.log(JSON.stringify(solarWindArray));  
  
, 60 * 1000);  
  
}());  
  
/*  
When activated on https://www.swpc.noaa.gov  
this script will get the solar wind speed every 1  
minute and add the solar wind speed to the  
array of objects, in addition to the date and  
time.  
*/
```

The first time that the script gathers the solar wind speed it looks like this:
[{"date":"8/28/2023, 7:15:49 AM","speed":"323"}]

The second time that the script gathers the solar wind speed it looks like this:

```
[{"date":"8/28/2023, 7:15:49  
AM","speed":"323"}, {"date":"8/28/2023, 7:16:49  
AM","speed":"325"}]
```

The third time that the script gathers the solar wind speed it looks like this:

```
[{"date":"8/28/2023, 7:15:49  
AM","speed":"323"}, {"date":"8/28/2023, 7:16:49  
AM","speed":"325"}, {"date":"8/28/2023, 7:17:49  
AM","speed":"324"}]
```

The fourth time that the script gathers the solar wind speed it looks like this:

```
[{"date":"8/28/2023, 7:15:49  
AM","speed":"323"}, {"date":"8/28/2023, 7:16:49  
AM","speed":"325"}, {"date":"8/28/2023, 7:17:49  
AM","speed":"324"}, {"date":"8/28/2023, 7:18:49  
AM","speed":"323"}]
```

*/

```
javascript:(  
/* Timer - Every 5 Seconds, Trigger function */  
function()  
{  
    let counter = 0;  
  
    function showCounterData()  
    {  
        console.log(counter);  
  
        counter += 1;  
    }  
  
    setInterval(showCounterData, 5000);  
}  
);
```

```
javascript:(  
/* Timer - Every 1 Second, COUNT UP */  
function()  
{  
    let counter = 0;  
  
    function updateIt()  
    {  
        counter += 1;  
  
        return counter;  
    }  
  
    function createCounterDiv()  
    {  
        let ourDiv =  
document.createElement("div");  
        ourDiv.id = "theDiv";  
        ourDiv.style.position = "absolute";  
        ourDiv.style.left = 20 + "px";  
        ourDiv.style.top = 150 + "px";  
        ourDiv.style.width = 100 + "px";  
        ourDiv.style.height = 25 + "px";  
        ourDiv.style.padding = 10 + "px";  
    }  
})()
```

```
ourDiv.style.backgroundColor = "rgb(0, 0,  
0)";  
ourDiv.style.fontSize = 20 + "px";  
ourDiv.style.color = "rgb(255, 255, 255)";  
ourDiv.innerHTML = updateIt();  
document.body.append(ourDiv);  
}  
  
setInterval(createCounterDiv, 1000);  
}());
```

```
javascript:(
/* Timer - Every 1 Second, COUNT DOWN,
clearInterval */
function()
{
    let counter = prompt("Enter Count Down
Start Time");

    function countDown()
    {
        counter -= 1;

        if (counter == 0)
        {
            clearInterval(ourTimer);
        }

        return counter;
    }

    function createCounterDiv()
    {
        let ourDiv =
document.createElement("div");
        ourDiv.id = "theDiv";
}
```

```
ourDiv.style.position = "absolute";
ourDiv.style.left = 100 + "px";
ourDiv.style.top = 100 + "px";
ourDiv.style.padding = 10 + "px";
ourDiv.style.borderRadius = 8 + "px";
ourDiv.style.backgroundColor = "rgb(0, 0,
0)";
ourDiv.style.fontSize = 25 + "px";
ourDiv.style.fontWeight = "bold";
ourDiv.style.color = "rgb(255, 255, 255)";
ourDiv.innerHTML = countDown();
document.body.append(ourDiv);
}

let ourTimer = setInterval(createCounterDiv,
1000);

}());
```

```
javascript:(  
/* Array of Objects - JSON.stringify */  
function()  
{  
let people =  
[  
{  
    name: 'Melissa',  
    date: '1980/03/01',  
},  
{  
    name: 'Tabitha',  
    date: '1983/04/05'  
}  
];  
  
function showData(whichArray)  
{  
    console.log(whichArray);  
  
    console.log(JSON.stringify(whichArray));  
}  
  
showData(people);
```

```
})();
```

```
/*
```

Here is the Output

```
console.log(people);
0: Object { name: "Melissa", date: "1980/03/01" }

1: Object { name: "Tabitha", date: "1983/04/05" }

console.log(JSON.stringify(people));
[{"name": "Melissa", "date": "1980/03/01"}, {"name": "Tabitha", "date": "1983/04/05"}]
```

```
*/
```

```
javascript:(  
/* Array of Objects - for loop */  
function()  
{  
let people =  
[  
{  
    name: 'Melissa',  
    date: '1980/03/01',  
},  
  
{  
    name: 'Tabitha',  
    date: '1983/04/05'  
}  
];  
  
function showData(whichArray)  
{  
    for (let x = 0; x < whichArray.length; x++)  
    {  
        console.log(whichArray[x]);  
    }  
}
```

```
showData(people);
```

```
})();
```

```
/*
```

```
Object { name: "Melissa", date: "1980/03/01" }
```

```
Object { name: "Tabitha", date: "1983/04/05" }
```

```
*/
```

```
javascript:(  
/* Array of Objects - while loop */  
function()  
{  
let people =  
[  
{  
    name: 'Melissa',  
    date: '1980/03/01',  
},  
  
{  
    name: 'Tabitha',  
    date: '1983/04/05'  
}  
];  
  
function showData(whichArray)  
{  
let x = 0;  
  
while (x < whichArray.length)  
{  
    console.log(whichArray[x]);  
}
```

```
    x += 1;  
}  
}  
  
showData(people);  
  
}());  
  
/*  
{ name: 'Melissa', date: '1980/03/01' }  
{ name: 'Tabitha', date: '1983/04/05' }  
*/
```

```
javascript:(  
/* Array of Objects - Names only */  
function()  
{  
let people =  
[  
{  
    name: 'Melissa',  
    date: '1980/03/01',  
},  
  
{  
    name: 'Tabitha',  
    date: '1983/04/05'  
}  
];  
  
function showData(whichArray)  
{  
let x = 0;  
  
while (x < whichArray.length)  
{  
    console.log(whichArray[x].name);  
}
```

```
    x += 1;  
}  
}  
  
showData(people);  
  
}());  
  
/*  
Melissa  
Tabitha  
*/  
  
/*  
console.log(whichArray[x].name);  
works the same as  
console.log(whichArray[x]['name']);  
*/
```

```
javascript:(  
/* Array of Objects - Dates only */  
function()  
{  
let people =  
[  
{  
    name: 'Melissa',  
    date: '1980/03/01',  
},  
  
{  
    name: 'Tabitha',  
    date: '1983/04/05'  
}  
];  
let x = 0;  
  
while (x < people.length)  
{  
    console.log(people[x].date);  
  
    x += 1;  
}
```

}());

/*
1980/03/01
1983/04/05
*/

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```
javascript:(  
/* Array of Objects - for loop */  
function()  
{  
    let people =  
    [  
        {  
            name: 'Melissa',  
            date: '1980/03/01',  
        },  
        {  
            name: 'Tabitha',  
            date: '1983/04/05'  
        }  
    ];  
  
    function showData(whichArray)  
    {  
        let output = 'Name\t\tDate\n';  
  
        for (let x = 0; x < whichArray.length; x++)  
        {  
            output = output + whichArray[x].name;  
  
            output += "\t";  
        }  
        return output;  
    }  
  
    alert(showData(people));  
}
```

```
    output += whichArray[x].date;

    output += "\n";
}

console.log(output);

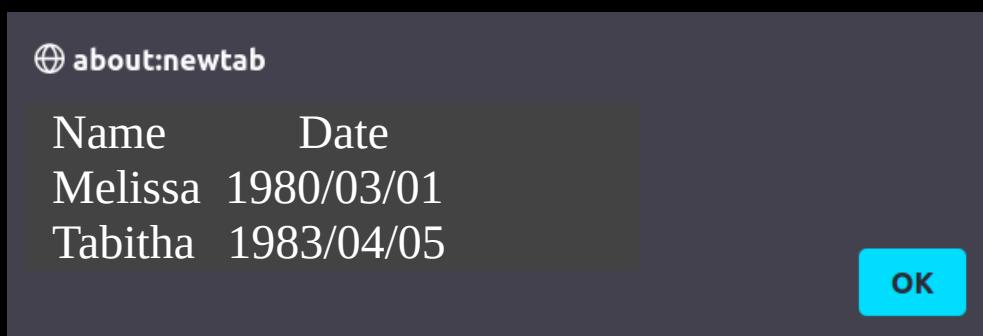
alert(output);

}

showData(people);

}());

/*
Name      Date
Melissa  1980/03/01
Tabitha  1983/04/05
*/
```



```
javascript:(  
/* Array of Objects - First Letter Initial */  
function()  
{  
let people =  
[  
{  
    name: 'Melissa',  
    date: '1980/03/01',  
},  
  
{  
    name: 'Tabitha',  
    date: '1983/04/05'  
}  
];  
  
function  
showFirstLetterOfName(whichArray)  
{  
let x = 0  
  
while (x < whichArray.length)  
{  
    console.log(whichArray[x].name[0]);  
}
```

```
    x += 1;
}
}

showFirstLetterOfName(people);

}());

/*
M
T
*/
/*
console.log(whichArray[x].name[0]);

works the same as

console.log(whichArray[x]['name'][0]);
*/
```

```
javascript:(  
/* Array of Objects - First 3 Letter Initials */  
function()  
{  
let people =  
[  
{  
    name: 'Melissa',  
    date: '1980/03/01',  
},  
  
{  
    name: 'Tabitha',  
    date: '1983/04/05'  
}  
];  
  
function showData(whichArray)  
{  
let x = 0;  
  
while (x < whichArray.length)  
{  
    console.log(whichArray[x]['name'][0] +  
    whichArray[x]['name'][1] +  
    whichArray[x]['name'][2]);  
}  
}  
);
```

```
whichArray[x]['name'][2]);  
  
    x += 1;  
}  
}  
  
showData(people);  
  
}());  
  
/*  
Mel  
Tab  
*/
```

```
javascript:(  
/* Array of Objects - Filter by Year */  
function()  
{  
    let people =  
    [  
        {  
            name: 'Melissa',  
            date: '1980/03/01',  
        },  
  
        {  
            name: 'Tabitha',  
            date: '1983/04/05'  
        },  
  
        {  
            name: 'Jane',  
            date: '1987/08/12'  
        }  
    ];  
  
    function sortByDate(whichArray, direction)  
    {  
        if (direction == "up")  
        {  
            // Your code here  
        }  
    }  
}
```

```
whichArray.sort(function(a, b)
{
    return new Date(a.date) - new
Date(b.date);
}

else if (direction == "down")
{
    whichArray.sort(function(a, b)
{
    return new Date(b.date) - new
Date(a.date);
}
}

function showData(whichArray)
{
    for (let x = 0; x < whichArray.length; x++)
{
    if (whichArray[x].date >= "1981")
{
        console.log(whichArray[x].name + "\n" + whichArray[x].date);
}
}
```

```
        }  
    }  
  
sortByDate(people, "up");  
  
showData(people);  
  
}());  
  
/*  
Tabitha  
1983/04/05  
  
Jane  
1987/08/12  
*/
```

```
javascript:(  
/* Array of Objects - Filter by Year and Month */  
function()  
{  
    let people =  
    [  
        {  
            name: 'Melissa',  
            date: '1980/03/01',  
        },  
  
        {  
            name: 'Tabitha',  
            date: '1983/04/05'  
        },  
  
        {  
            name: 'Joan',  
            date: '1983/05/17'  
        },  
  
        {  
            name: 'Jane',  
            date: '1987/08/12'  
        }  
    ];
```

```
function sortByDate(whichArray, direction)
{
    if (direction == "up")
    {
        whichArray.sort(function(a, b)
        {
            return new Date(a.date) - new
Date(b.date);
        });
    }

    else if (direction == "down")
    {
        whichArray.sort(function(a, b)
        {
            return new Date(b.date) - new
Date(a.date);
        });
    }
}
```

```
function showData(whichArray)
{
    for (let x = 0; x < whichArray.length; x++)
    {
```

```
if (whichArray[x].date >= "1983/05")
{
    console.log(whichArray[x].name + "\n" + whichArray[x].date);
}
}

sortByDate(people, "up");

showData(people);

}());

/*
Joan
1983/05/17

Jane
1987/08/12
*/
```

```
javascript:(  
/* Array of Objects - Filter by Year, Month and  
Day */  
function()  
{  
let people =  
[  
 {  
   name: 'Melissa',  
   date: '1980/03/01',  
 },  
 {  
   name: 'Tabitha',  
   date: '1983/04/05'  
 },  
 {  
   name: 'Joan',  
   date: '1983/05/17'  
 },  
  
 {  
   name: 'Jane',  
   date: '1987/08/12'  
 }  
]
```

```
];

function sortByDate(whichArray, direction)
{
    if (direction == "up")
    {
        whichArray.sort(function(a, b)
        {
            return new Date(a.date) - new
Date(b.date);
        });
    }

    else if (direction == "down")
    {
        whichArray.sort(function(a, b)
        {
            return new Date(b.date) - new
Date(a.date);
        });
    }
}

function showData(whichArray)
{
    for (let x = 0; x < whichArray.length; x++)
}
```

```
{  
    if (whichArray[x].date == "1983/04/05")  
    {  
        console.log(whichArray[x].name + "\n" + whichArray[x].date);  
    }  
}  
  
sortByDate(people, "up");  
  
showData(people);  
}());  
  
/*  
Tabitha  
1983/04/05  
*/
```

```
javascript:(  
/* Array of Objects - Filter by Year, Month, Day  
and Time */  
function()  
{  
let people =  
[  
 {  
   name: 'Melissa',  
   date: '1980/03/01 12:00PM',  
 },  
 {  
   name: 'Tabitha',  
   date: '1983/04/05 2:57PM'  
 },  
 {  
   name: 'Jennifer',  
   date: '1983/05/17 3:45PM'  
 },  
 {  
   name: 'Joan',  
   date: '1983/05/17 4:07PM'  
 },  
 ]  
 let filteredPeople = people.filter(function(person){  
   return person.date.substring(0, 4) === '1983' &  
         person.date.substring(5, 7) === '05' &  
         person.date.substring(8, 10) === '17';  
 })  
 console.log(filteredPeople);  
})()
```

```
{  
    name: 'Jane',  
    date: '1987/08/12 8:23PM'  
}  
];
```

```
function sortByDate(whichArray, direction)  
{  
    if (direction == "up")  
    {  
        whichArray.sort(function(a, b)  
        {  
            return new Date(a.date) - new  
Date(b.date);  
        });  
    }  
  
    else if (direction == "down")  
    {  
        whichArray.sort(function(a, b)  
        {  
            return new Date(b.date) - new  
Date(a.date);  
        });  
    }  
}
```

```
}

function showData(whichArray)
{
    for (let x = 0; x < whichArray.length; x++)
    {
        if (whichArray[x].date >= "1983/05/17
3:50PM")
        {
            console.log(whichArray[x].name + "\n" + whichArray[x].date);
        }
    }
}

sortByDate(people, "up");

showData(people);
}());

/*
Joan
1983/05/17 4:07PM
Jane
1987/08/12 8:23PM
*/
```

```
javascript:(  
/* Array of Objects - Filter Date A to Date B,  
YYYY/MM/DD */  
function()  
{  
let people =  
[  
 {  
   name: 'Melissa',  
   date: '1980/03/01 12:00PM',  
 },  
 {  
   name: 'Tabitha',  
   date: '1983/04/05 2:57PM'  
 },  
 {  
   name: 'Jennifer',  
   date: '1983/05/17 3:45PM'  
 },  
 {  
   name: 'Joan',  
   date: '1983/05/17 4:07PM'  
 },  
 ]  
 let filteredPeople = people.filter(function(person){  
   return person.date >= '1983/05/17' &  
         person.date <= '1983/05/17 4:07PM'  
 })  
 console.log(filteredPeople)  
})()
```

```
{  
    name: 'Jane',  
    date: '1987/08/12 8:23PM'  
}  
];
```

```
function sortByDate(whichArray, direction)  
{  
    if (direction == "up")  
    {  
        whichArray.sort(function(a, b)  
        {  
            return new Date(a.date) - new  
Date(b.date);  
        });  
    }  
  
    else if (direction == "down")  
    {  
        whichArray.sort(function(a, b)  
        {  
            return new Date(b.date) - new  
Date(a.date);  
        });  
    }  
}
```

```
}

function showData(whichArray)
{
    for (let x = 0; x < whichArray.length; x++)
    {
        if (whichArray[x].date >= "1983/05/17
3:45PM" && whichArray[x].date <= "1983/05/17
4:00PM")
        {
            console.log(whichArray[x].name + "\n" + whichArray[x].date);
        }
    }
}

sortByDate(people, "up");

showData(people);

}());
```

/*
Jennifer
1983/05/17 3:45PM
*/

```
javascript:(  
/* Array of Objects - Special way to show keys  
and values */  
function()  
{  
    let people =  
    [  
        {  
            name: 'Melissa',  
            date: '2021/04/01',  
        },  
        {  
            name: 'Tabitha',  
            date: '2021/04/05'  
        }  
    ];  
  
    for (let x = 0; x < people.length; x++)  
    {  
        let person = people[x];  
  
        let entries = Object.entries(person);  
  
        for (let j = 0; j < entries.length; j++)  
        {  
            let key = entries[j][0];  
        }  
    }  
}
```

```
let value = entries[j][1];  
  
console.log(key + ': ' + value);  
}  
}  
})();
```

/*
**we use a traditional for loop to iterate through
this array and access both the key and value
for each property in the object**

name: Melissa
date: 2021/04/01
name: Tabitha
date: 2021/04/05

*/

```
javascript:(  
/* Array of Objects with Nested Arrays */  
function()  
{  
    function showData()  
{  
        let data =  
        [  
            {  
                name: 'James',  
                age: 30,  
                hobbies: ['Gardening', 'Gaming']  
            },  
            {  
                name: 'Joan',  
                age: 25,  
                hobbies: ['Hiking', 'Painting']  
            }  
        ];  
    };  
};
```

```
let message = 'Array of Objects:\n';
```

```
for (let x = 0; x < data.length; x++)  
{  
    let person = data[x];  
}
```

```
    message += 'Name: ' + person.name +
    ', Age: ' + person.age +
    ', Hobbies: [' + person.hobbies.join(', ') + ']\n';
}

console.log(message);

alert(message);
}

showData();

}());
```

```
javascript:(  
/* Array of Objects - Show Data on Rows of  
Divs */  
function()  
{  
    function showData()  
{  
        let data =  
        [  
            {  
                name: 'Item 1',  
                description: 'Description 1'  
            },  
            {  
                name: 'Item 2',  
                description: 'Description 2'  
            },  
            {  
                name: 'Item 3',  
                description: 'Description 3'  
            },  
            {  
                name: 'Item 4',  
                description: 'Description 4'  
            }  
        ]  
        return data;  
    }  
    showData();  
}
```

```
        description: 'Description 4'  
    },  
  
    {  
        name: 'Item 5',  
        description: 'Description 5'  
    },  
  
    {  
        name: 'Item 6',  
        description: 'Description 6'  
    },  
  
    {  
        name: 'Item 7',  
        description: 'Description 7'  
    },  
  
    {  
        name: 'Item 8',  
        description: 'Description 8'  
    },  
  
    {  
        name: 'Item 9',  
        description: 'Description 9'
```

```
    },
];

/* create a container for the rows of divs */
let container =
document.createElement('div');
container.style.position = "absolute";
container.style.left = 10 + "px";
container.style.top = 10 + "px";
container.style.maxWidth = '800px';
container.style.padding = '10px';
container.style.display = 'flex';
container.style.flexWrap = 'wrap';
container.style.justifyContent = 'space-
between';
document.body.append(container);

/* function to create a div for each object */
function createDivForObject(object)
{
    let dataDiv =
document.createElement('div');
    dataDiv.style.width = '30%';
    dataDiv.style.paddingLeft = '10px';
    dataDiv.style.paddingRight = '10px';
    dataDiv.style.paddingBottom = '5px';
```

```
dataDiv.style.marginLeft = '1px';
dataDiv.style.marginRight = '1px';
dataDiv.style.marginBottom = '7px';
dataDiv.style.marginTop = '7px';
dataDiv.style.border = '1px solid';
dataDiv.style.borderColor = 'rgb(255,
255, 255)';

    dataDiv.innerHTML = '<h3>' +
object.name + '</h3>' + '<p>' +
object.description + '</p>';

    container.append(dataDiv);
}

/* create divs for each object in the array */
for (let x = 0; x < data.length; x++)
{
    createDivForObject(data[x]);
}
}

showData();

}());
```



Item 1

Description 1

Item 2

Description 2

Item 3

Description 3

Item 4

Description 4

Item 5

Description 5

Item 6

Description 6

Item 7

Item 8

Item 9

```
javascript:(  
/* Array of Objects - map, filter, reduce - Finds  
Ages Over Specified Age */  
function()  
{  
    function  
showNamesOverSpecifiedAge(whichAge)  
    {  
        let data =  
        [  
            {  
                name: 'John',  
                age: 30  
            },  
            {  
                name: 'Jane',  
                age: 25  
            },  
            {  
                name: 'James',  
                age: 35  
            },  
            {  
                name: 'Alice',  
                age: 28  
            },  
        ]  
        return data.filter(function(item){  
            if(item.age > whichAge){  
                return item.name;  
            }  
        })  
    }  
}  
)
```

```
{  
    name: 'Joan',  
    age: 40  
}  
];  
  
/*----*/
```

```
/* map to extract names */  
let names = [];  
  
for (let x = 0; x < data.length; x++)  
{  
    names.push(data[x].name);  
}  
console.log('Mapped Names:', names);  
  
/*----*/
```

```
/* filter to find people over 30 */  
let ageArray = [];  
  
for (let x = 0; x < data.length; x++)  
{  
    if (data[x].age >= whichAge)  
    {
```

```
    ageArray.push(data[x]);
}
}
console.log('People Over ' + whichAge + '
Years Old:', ageArray);
```

```
/*----*/
```

```
/* reduce to calculate total age */
```

```
let totalAge = 0;
```

```
for (let x = 0; x < data.length; x++)
```

```
{
```

```
    totalAge += data[x].age;
```

```
}
```

```
console.log('Total Age:', totalAge);
```

```
/*----*/
```

```
/* show each item */
```

```
for (let x = 0; x < data.length; x++)
```

```
{
```

```
    console.log('Name:', data[x].name, '|
```

```
Age:', data[x].age);
```

```
}
```

}

showNamesOverSpecifiedAge(30);

}());

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```
javascript:(  
/* Array of Objects - Emoji Fun */  
function()  
{  
    let funObjects =  
    [  
        {  
            name: "Smiling Face",  
            description: "A face with a big smile  
😊",  
        },  
        {  
            name: "Big Hat",  
            description: "A big hat 🎩",  
        },  
        {  
            name: "SunShades",  
            description: "A pair of sunshades 😎",  
        },  
    ];  
  
    let message = "Fun Objects:\n\n";  
  
    for (let x = 0; x < funObjects.length; x++)
```

```
{  
    message += "Name: " +  
funObjects[x].name + "\n";  
  
    message += "Description: " +  
funObjects[x].description + "\n\n";  
}  
  
console.log(message);  
  
alert(message);  
  
}());
```

```
javascript:(  
/* Array of Objects - Random Object –  
Programming Languages */  
function()  
{  
    let programmingFacts =  
    [  
        {  
            name: "C",  
            fact: "Invented in 1972",  
        },  
        {  
            name: "C++",  
            fact: "Invented in 1985",  
        },  
        {  
            name: "JavaScript",  
            fact: "Invented in 1995",  
        }  
    ];  
  
    function generateRandomFact(whichArray)  
    {  
        let randomIndex =  
        Math.floor(Math.random() * whichArray.length);  
    }  
}
```

```
let randomFact =  
whichArray[randomIndex];  
  
let message = randomFact.name + "\n" +  
randomFact.fact + "\n";  
  
console.log(message);  
  
alert(message);  
}  
  
generateRandomFact(programmingFacts);  
}());
```

```
javascript:(  
/* Array of Objects - Random Object - Periodic  
Elements */  
function()  
{  
let periodicTable =  
[  
 {  
symbol: "H",  
name: "Hydrogen",  
atomicNumber: 1,  
},  
  
{  
symbol: "He",  
name: "Helium",  
atomicNumber: 2,  
},  
  
{  
symbol: "Li",  
name: "Lithium",  
atomicNumber: 3,  
},  
  
{  
}
```

```
symbol: "Be",
name: "Beryllium",
atomicNumber: 4,
}
];
}

function generateRandomFact(whichArray)
{
    let randomIndex =
Math.floor(Math.random() * whichArray.length);

    let randomFact =
whichArray[randomIndex];

    let message = randomFact.symbol + "\n" +
randomFact.name + "\n" +
randomFact.atomicNumber;

    console.log(message);

    alert(message);
}

generateRandomFact(periodicTable);

}());
```

```
javascript:(  
/* Array of Objects - Calculate the Average  
Score */  
function()  
{  
    function calculateAverageScore()  
{  
        let students =  
        [  
            {  
                name: "Alice",  
                score: 85  
            },  
            {  
                name: "Bob",  
                score: 92  
            },  
            {  
                name: "James",  
                score: 78  
            },  
            {  
                name: "David",  
                score: 88  
            }  
        ]  
        let totalScore = 0;  
        let count = 0;  
        for (let student of students) {  
            totalScore += student.score;  
            count++;  
        }  
        const averageScore = totalScore / count;  
        return averageScore;  
    }  
}  
);
```

```
    score: 88
  },
  {
    name: "Jennifer",
    score: 95
  },
];
}

function calculateAverage(scores)
{
  let total = 0;

  for (let x = 0; x < scores.length; x++)
  {
    total += scores[x].score;
  }

  return total / scores.length;
}

/* calculate the average score */
let averageScore =
calculateAverage(students);

/* display the result */
```

```
    alert("Average Exam Score: " +  
averageScore.toFixed(2));  
}  
  
calculateAverageScore();  
  
}());
```

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```
javascript:(  
/* Array of Objects - Calculate Average Score,  
Standard Deviation */  
function()  
{  
let students =  
[  
 {  
   name: "Alice",  
   score: 85  
 },  
 {  
   name: "Bob",  
   score: 92  
 },  
 {  
   name: "Jennifer",  
   score: 78  
 },  
 {  
   name: "David",  
   score: 88  
 },  
 ]  
return students  
})()
```

```
{  
  name: "Joan",  
  score: 95  
},  
];
```

function calculateAverage(scores)

```
{  
  let total = 0;  
  
  for (let x = 0; x < scores.length; x++)  
  {  
    total += scores[x].score;  
  }  
  
  return total / scores.length;  
}
```

function calculateStandardDeviation(scores)

```
{  
  let average = calculateAverage(scores);  
  
  let variance = 0;  
  
  for (let x = 0; x < scores.length; x++)
```

```
{  
    variance += Math.pow(scores[x].score -  
average, 2);  
}  
  
let stdDeviation = Math.sqrt(variance /  
scores.length);  
  
return stdDeviation;  
}  
  
/* calculate the average score and standard  
deviation */  
let averageScore =  
calculateAverage(students);  
  
let standardDeviation =  
calculateStandardDeviation(students);  
  
/* display the results */  
alert("Average Score: " +  
averageScore.toFixed(2) + "\nStandard  
Deviation: " + standardDeviation.toFixed(2));  
}());
```

```
javascript:(  
/* Array of Objects - Find Max/Min Temperature */  
function()  
{  
    function calculateMinMaxTemperature()  
{  
        let cities =  
        [  
            {  
                name: "New York",  
                temperature: 90  
            },  
            {  
                name: "Los Angeles",  
                temperature: 82  
            },  
            {  
                name: "Chicago",  
                temperature: 76  
            },  
            {  
                name: "Boston",  
                temperature: 70  
            }  
        ]  
        let maxTemp = cities[0].temperature;  
        let minTemp = cities[0].temperature;  
        for (let i = 1; i < cities.length; i++) {  
            if (cities[i].temperature > maxTemp) {  
                maxTemp = cities[i].temperature;  
            } else if (cities[i].temperature < minTemp) {  
                minTemp = cities[i].temperature;  
            }  
        }  
        return `The maximum temperature is ${maxTemp} and the minimum temperature is ${minTemp}.`  
    }  
}
```

```
    temperature: 95
},
{
    name: "Denver",
    temperature: 87
},
];

```

```
function findMaxTemperature(whichArray)
{
    let max = whichArray[0].temperature;

    for (let x = 1; x < whichArray.length; x++)
    {
        if (whichArray[x].temperature > max)
        {
            max = whichArray[x].temperature;
        }
    }
    return max;
}
```

```
function findMinTemperature(whichArray)
{
    let min = whichArray[0].temperature;
```

```
for (let x = 1; x < whichArray.length; x+
+)
{
    if (whichArray[x].temperature < min)
    {
        min = whichArray[x].temperature;
    }
}
return min;
}

/* find the maximum and minimum
temperatures */
let maxTemperature =
findMaxTemperature(cities);

let minTemperature =
findMinTemperature(cities);

/* show the results */
alert("Maximum Temperature: " +
maxTemperature + "\u00b0F\nMinimum Temperature:
" + minTemperature + "\u00b0F");
}
```

```
calculateMinMaxTemperature();  
});
```

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```
javascript:(  
/* Array of Objects - Calculate Sales Total */  
function()  
{  
    function calculateSalesTotal()  
{  
        let products =  
        [  
            {  
                name: "Store A",  
                sales: 250  
            },  
            {  
                name: "Store B",  
                sales: 180  
            },  
            {  
                name: "Store C",  
                sales: 320  
            },  
            {  
                name: "Store D",  
                sales: 420  
            },  
        ];  
    }  
}
```

```
function calculateTotalSales(salesData)
{
    let total = 0;

    for (let x = 0; x < salesData.length; x++)
    {
        total += salesData[x].sales;
    }

    return total;
}

/* calculate the total sales */
let totalSales =
calculateTotalSales(products);

return "Total Sales: $" +
totalSales.toFixed(2);
}

/* display the result */
console.log(calculateSalesTotal());

alert(calculateSalesTotal());
}());
```

```
javascript:(  
/* Array of Objects - Count occurrences of each  
item */  
function()  
{  
    function countOccurrencesOfEachItem()  
{  
        let food =  
        [  
            {  
                name: "Apple",  
                quantity: 3  
            },  
            {  
                name: "Banana",  
                quantity: 2  
            },  
            {  
                name: "Strawberry",  
                quantity: 4  
            },  
            {  
                name: "Apple",  
                quantity: 1  
            }  
        ]  
        let counts = {}  
        for (let item of food) {  
            if (counts[item.name] === undefined) {  
                counts[item.name] = 1  
            } else {  
                counts[item.name] += 1  
            }  
        }  
        return counts  
    }  
}
```

```
        quantity: 2
    },
    {
        name: "Pear",
        quantity: 3
    },
    {
        name: "Banana",
        quantity: 1
    },
];
}

function countFruitOccurrences(items)
{
    let fruitCounts = {};
    for (let x = 0; x < items.length; x++)
    {
        let itemName = items[x].name;
        if (fruitCounts[itemName])
        {
            fruitCounts[itemName] +=
items[x].quantity;
```

```
        }
    else
    {
        fruitCounts[itemName] =
items[x].quantity;
    }
}

return fruitCounts;
}

/* count the occurrences of each fruit */
let fruitOccurrences =
countFruitOccurrences(food);

/* display the results */
let message = "Fruit Occurrences:\n\n";

let fruitKeys =
Object.keys(fruitOccurrences);

for (let x = 0; x < fruitKeys.length; x++)
{
    let fruit = fruitKeys[x];
    message += fruit + ": " + fruitOccurrences[fruit]
    + "\n";
}
```

```
    console.log(message);

    alert(message);
}

countOccurrencesOfEachItem();

}());

/*
Fruit Occurrences:
Apple: 5
Banana: 3
Strawberry: 4
Pear: 3
*/
```

```
javascript:(  
/* Links - List and Count */  
function()  
{  
    function listLinksAndCount()  
{  
        let links = document.links;  
  
        let linkCount = links.length;  
  
        if (linkCount === 0)  
        {  
            alert('No links found on the page');  
        }  
        else  
        {  
            let linkSources = [];  
  
            for (let x = 0; x < linkCount; x++)  
            {  
                linkSources.push(links[x].href);  
            }  
  
            let data = 'Total Links: ' +  
linkCount + '\n\n' +  
'Link Sources: ' +
```

```
linkSources.join('\n');

console.log(data);

alert(data);
}

}

listLinksAndCount();

}());
```

```
javascript:(
/* Element - List and Count Specified Type */
function()
{
    function listAndCount(elementType)
    {
        let elements =
document.getElementsByTagName(elementTy
pe);

        let elementCount = elements.length;

        if (elementCount === 0)
        {
            alert('No ' + elementType + 's found on
this page');
        }
        else
        {
            let elementContents = [];

            for (let x = 0; x < elementCount; x++)
            {
elementContents.push(elements[x].textConten
t);
            }
        }
    }
}
```

```
let data = 'Total ' +
elementType + 's: ' +
elementCount + '\n\n' +
elementType + '' +
'Contents:' + '\n' +
elementContents.join('\n');

console.log(data);

alert(data);
}

}

listAndCount('a');

}());
```

```
javascript:(
/* Bouncing Ball with Linear Motion - Bounces
Up and Down - No Trigonometry required */
function()
{
    function createBallWithMotion()
    {
        let ball = document.createElement('div');
        ball.id = 'ball';
        ball.style.position = "absolute";
        ball.style.width = "50px";
        ball.style.height = "50px";
        ball.style.borderRadius = "50%";
        ball.style.margin = "0px";
        ball.style.overflow = "hidden";
        ball.style.backgroundColor = "aqua";
        document.body.append(ball);

        /* 1 goes down, -1 goes up */
        let direction = 1;

        let position = 0;

        let speed = 2;

        function animate()

```

```
{  
    position += direction * speed;  
  
    ball.style.top = position + 'px';  
  
    if (position >= (window.innerHeight - 50)  
    || position <= 0)  
    {  
        /* reverse direction at top or bottom */  
        direction *= -1;  
    }  
}  
  
let animationFrameId001;  
  
function gameLoop()  
{  
    animate();  
  
    animationFrameId001 =  
requestAnimationFrame(gameLoop);  
}  
  
gameLoop();  
}
```

```
createBallWithMotion();  
});
```

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```
javascript:(
/* Bouncing Ball with Linear Motion - Starts at
an Angle - No Trigonometry Required */
function()
{
    function createBallWithMotion()
    {
        let ball = document.createElement('div');
        ball.id = 'ball';
        ball.style.position = "absolute";
        ball.style.width = "50px";
        ball.style.height = "50px";
        ball.style.borderRadius = "50%";
        ball.style.margin = "0px";
        ball.style.overflow = "hidden";
        ball.style.backgroundColor = "aqua";
        document.body.append(ball);

        let x = 0;
        let y = 0;

        let dx = 5;
        let dy = 5;

        function animate()
        {

```

```
x += dx;  
y += dy;  
  
if (x < 0 || x > window.innerWidth -  
ball.clientWidth)  
{  
    dx = -dx;  
}  
  
if (y < 0 || y > window.innerHeight -  
ball.clientHeight)  
{  
    dy = -dy;  
}  
  
ball.style.left = x + 'px';  
ball.style.top = y + 'px';  
}  
  
let animationFrameId001;  
  
function gameLoop()  
{  
    animate();
```

```
animationFrameId001 =  
requestAnimationFrame(gameLoop);  
}  
  
gameLoop();  
}  
  
createBallWithMotion();  
}());
```

```
javascript:(
/* Bouncing Ball with Linear Motion - Starts at
an Angle - Trigonometry Angle Calculations */
function()
{
    function createBouncingBall()
    {
        let ball = document.createElement('div');
        ball.id = 'ball';
        ball.style.position = "absolute";
        ball.style.width = "50px";
        ball.style.height = "50px";
        ball.style.borderRadius = "50%";
        ball.style.margin = "0px";
        ball.style.overflow = "hidden";
        ball.style.backgroundColor = "aqua";
        document.body.append(ball);

        /* initial angle in degrees */
        let angle = 45;
        let speed = 2;

        /* convert degrees to radians for Math.sin
and Math.cos */
        let radians = angle * (Math.PI / 180);
    }
}
```

```
let xSpeed = Math.cos(radians) * speed;  
let ySpeed = Math.sin(radians) * speed;  
  
let positionX = 0;  
let positionY = 0;  
  
function animate()  
{  
    positionX += xSpeed;  
    positionY += ySpeed;  
  
    ball.style.left = positionX + 'px';  
    ball.style.top = positionY + 'px';  
  
    /* bounce off the walls */  
    if (positionX >= (window.innerWidth -  
50) || positionX <= 0)  
    {  
        xSpeed *= -1;  
    }  
  
    if (positionY >= (window.innerHeight -  
50) || positionY <= 0)  
    {  
        ySpeed *= -1;  
    }  
}
```

```
}
```

```
let animationFrameId001;

function gameLoop()
{
    animate();

    animationFrameId001 =
requestAnimationFrame(gameLoop);
}

gameLoop();
}

createBouncingBall();

}());
```

```
javascript:(
/* Bouncing Circles with Linear Motion - Starts
at an Angle - No Trigonometry Required */
function()
{
    let circles = [];

    let numberOfCircles = 10;

    function getRandomPosition()
    {
        let x = Math.floor(Math.random() *
window.innerWidth);

        let y = Math.floor(Math.random() *
window.innerHeight);

        return {
            x: x,
            y: y
        };
    }

    for (let x = 0; x < numberOfCircles; x++)
    {
        let circle = document.createElement('div');
```

```
circle.style.position = 'absolute';
circle.style.width = '20px';
circle.style.height = '20px';

circle.style.backgroundColor = 'none';
circle.style.borderStyle = 'solid';
circle.style.borderWidth = '1px';
circle.style.borderRadius = '50%';
circle.style.pointerEvents = 'none';
```

```
let position = getRandomPosition();
circle.style.left = position.x + 'px';
circle.style.top = position.y + 'px';
```

```
circle.dx = Math.random() * 4 - 2;
circle.dy = Math.random() * 4 - 2;
```

```
document.body.append(circle);
```

```
circles.push(circle);
```

```
}
```

```
function animate()
{
    for (let x = 0; x < circles.length; x++)
    {
```

```
let circle = circles[x];  
  
    circle.style.left =  
(parseInt(circle.style.left) + circle.dx) + 'px';  
  
    circle.style.top =  
(parseInt(circle.style.top) + circle.dy) + 'px';  
  
    if (parseInt(circle.style.left) <= 0 ||  
        parseInt(circle.style.left) >= window.innerWidth  
        - 20)  
    {  
        circle.dx *= -1;  
    }  
  
    if (parseInt(circle.style.top) <= 0 ||  
        parseInt(circle.style.top) >=  
        window.innerHeight - 20)  
    {  
        circle.dy *= -1;  
    }  
}  
  
let animationFrameId001;
```

```
function gameLoop()
{
    animate();

    animationFrameId001 =
requestAnimationFrame(gameLoop);
}

gameLoop();

}());
```

```
javascript:(  
/* Airplane - Projectile - Simulated Effect of  
Dropping projectile from airplane where the  
user clicks */  
function()  
{  
    let airplane = document.createElement('div');  
    airplane.style.position = 'absolute';  
    airplane.style.left = '-50px';  
    airplane.style.top = '50px';  
    airplane.style.width = '50px';  
    airplane.style.height = '20px';  
    airplane.style.backgroundColor = 'blue';  
    airplane.style.transition = 'all 2s linear';  
    document.body.append(airplane);  
  
/*----*/  
  
    let projectile =  
        document.createElement('div');  
    projectile.style.position = 'absolute';  
    projectile.style.width = '15px';  
    projectile.style.height = '15px';  
    projectile.style.borderRadius = "50%";  
    projectile.style.backgroundColor = 'aqua';  
    projectile.style.transition = 'all 1s linear';  
}
```

```
projectile.style.display = 'none';
document.body.append(projectile);

let flying = false;

document.onclick = function(event)
{
    if (!flying)
    {
        flying = true;

        airplane.style.transform = 'translate(' +
window.innerWidth + 'px, 0)';

        setTimeout(function()
        {
            let x = event.clientX;
            let y = event.clientY;

            projectile.style.left = x + 'px';
            projectile.style.top = '25px';

            projectile.style.display = 'block';

            /* projectile path */
        }, 10);
    }
}
```

```
projectile.style.transform =  
'translateY(' + (y - 25) + 'px)';  
    }, 1000);  
}  
};  
});
```



```
/*  
When a person left clicks their mouse on the  
screen an airplane will fly to the right and  
simulate dropping a projectile below, which  
will remain on the screen.  
*/
```

```
javascript:(  
/* Airplane - Projectile - Realistic - Projectile  
drops from the bottom middle of the airplane  
*/  
function()  
{  
    let airplane = document.createElement('div');  
    airplane.id = "airplane";  
    airplane.style.position = 'absolute';  
    airplane.style.left = '-50px';  
    airplane.style.top = '50px';  
    airplane.style.width = '50px';  
    airplane.style.height = '20px';  
    airplane.style.backgroundColor = 'blue';  
    airplane.style.transition = 'all 2s linear';  
    document.body.append(airplane);  
  
/*----*/  
  
    let projectile =  
        document.createElement('div');  
    projectile.id = "projectile";  
    projectile.style.position = 'absolute';  
    projectile.style.width = '15px';  
    projectile.style.height = '15px';  
    projectile.style.borderRadius = "50%";  
}
```

```
projectile.style.backgroundColor = 'aqua';
/* initially hide the object */
projectile.style.display = 'none';
document.body.append(projectile);

let flying = false;

document.onclick = function(event)
{
    if (!flying)
    {
        flying = true;

        let x = event.clientX + 15;
        let y = event.clientY;

        /* calculate the adjustment needed for
        the airplane's center */
        let airplaneCenterAdjustment =
airplane.offsetWidth / 2;

        /* set the plane's starting position to the
        left of the viewport */
        airplane.style.left = -
airplaneCenterAdjustment + 'px';
```

```
/* set the plane's final position (where it  
was clicked) */  
airplane.style.transform = 'translate(' +  
(x - airplaneCenterAdjustment) + 'px, 0);  
  
/* set the initial position of the projectile  
at the bottom middle of the airplane */  
let airplaneRect =  
airplane.getBoundingClientRect();  
  
let projectileLeft = x -  
airplaneCenterAdjustment;  
  
/* place the projectile at the bottom of  
the airplane */  
let projectileTop = airplaneRect.bottom;  
  
projectile.style.left = projectileLeft +  
'px';  
projectile.style.top = projectileTop +  
'px';  
  
/* calculate the distance to fall (from top  
to the user's click Y-coordinate) */  
let distanceToFall = y - projectileTop;
```

```
/* set a timeout to start the object's
descent and reveal it */
setTimeout(function()
{
    /* display the object to make it visible */
    projectile.style.display = 'block';

    /* set the initial time and speed */
    let startTime = null;

    /* falling speed: higher values make it
fall faster */
    let speed = 200;

    function
animateProjectile(timestamp)
{
    if (!startTime)
    {
        startTime = timestamp;
    }

    /* calculate the elapsed time */
    let elapsedTime = timestamp -
startTime;
```

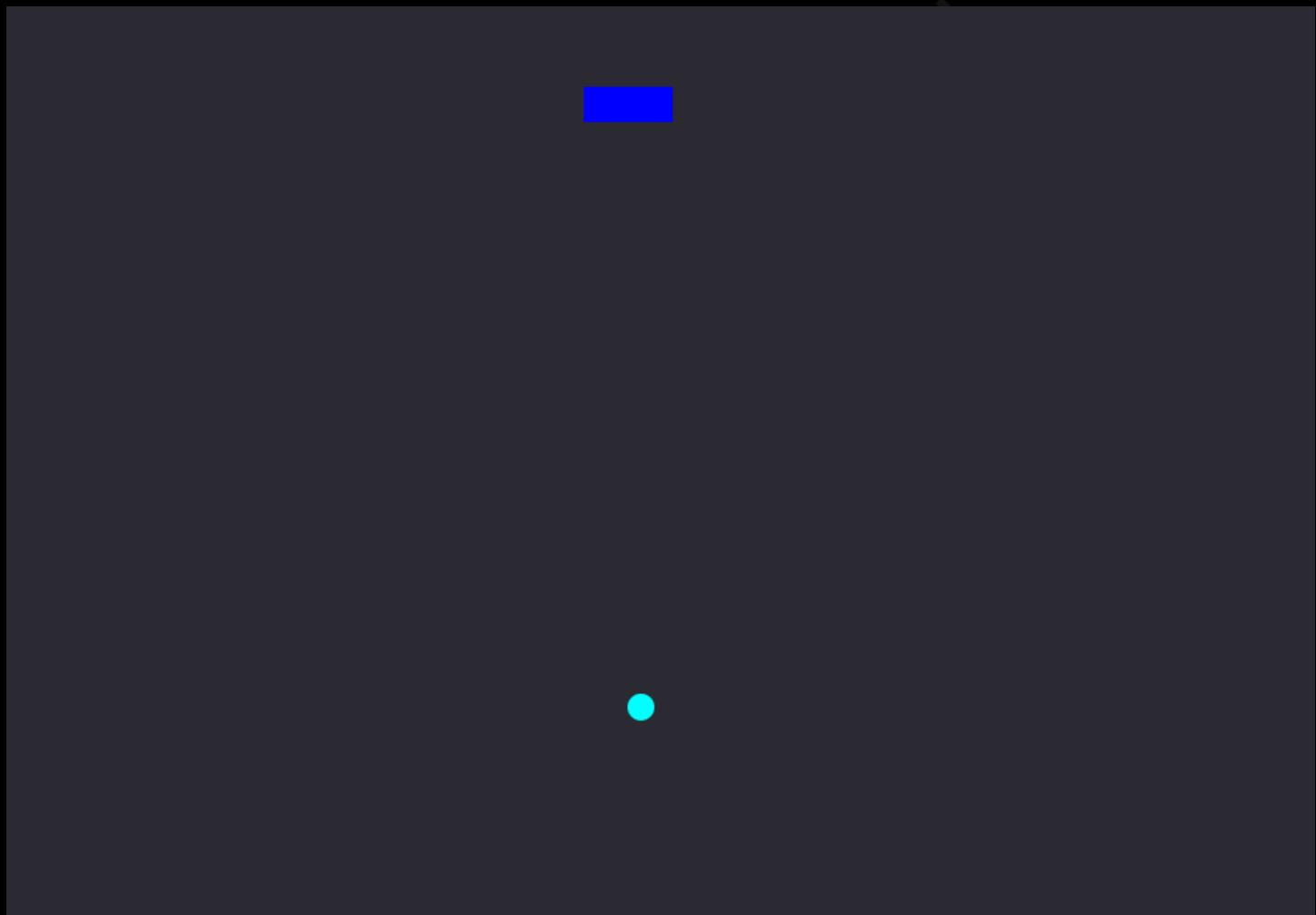
```
/* calculate the new top position  
based on the elapsed time and speed */  
let newY = (elapsedTime / 1000) *  
speed;  
  
if (newY < distanceToFall)  
{  
    /* continue the animation */  
requestAnimationFrame/animateProjectile);  
}  
else  
{  
    /* finish the animation when it  
reaches the target Y-coordinate */  
    newY = distanceToFall;  
}  
  
/* apply the new top position */  
projectile.style.transform =  
'translateY(' + newY + 'px)';  
}  
  
/* start the animation */  
requestAnimationFrame/animateProjectile);  
, 2000);
```

```
/* adjust the timeout delay based on  
the airplane's transition duration */
```

```
}
```

```
};
```

```
}());
```



```
javascript:(
/* Mouse Arrow Effect - Circles */
function()
{
    function changeMouseArrow()
    {
        const theEffect =
document.createElement('style');

        theEffect.innerText = `
* {
    cursor: url('data:image/svg+xml;utf8,<svg
xmlns="http://www.w3.org/2000/svg"
width="32" height="32" viewBox="0 0 24
24"><circle cx="12" cy="12" r="10"
stroke="white" stroke-width="2"
fill="transparent"/><circle cx="12" cy="12"
r="6" stroke="white" stroke-width="2"
fill="transparent"/><circle cx="12" cy="12"
r="2" fill="white"/></svg>'), auto !important;
    };
}

document.head.append(theEffect);
}
changeMouseArrow();
}());
```

```
javascript:(  
/* Animate Words Typing Effect */  
function()  
{  
    function animateText()  
{  
        let text = "Hi Everyone";  
  
        let x = 0;  
  
        let animationSpeed = 400;  
  
        let textDiv =  
document.createElement("div");  
textDiv.style.position = "fixed";  
textDiv.style.top = "50%";  
textDiv.style.left = "50%";  
textDiv.style.transform = "translate(-50%, -  
50%)";  
textDiv.style.fontSize = "25px";  
document.body.append(textDiv);  
  
let animation = setInterval(function()  
{  
    if (x < text.length)  
    {  
        textDiv.innerHTML = text.substring(0, x + 1);  
        x++;  
    }  
}, animationSpeed);  
    }  
    animateText();  
};  
)
```

```
textDiv.textContent =  
text.substring(0, x + 1);  
  
    x++;  
}  
else  
{  
    clearInterval(animation);  
}  
, animationSpeed);  
}  
  
animateText();  
}());  
  
/*  
displays a text of "Hi Everyone" with an  
animation. Each letter appears one by one.  
*/
```

```
javascript:(  
/* Detect which Web Browser is being used */  
function()  
{  
    function detectWebBrowser()  
{  
        if  
(navigator.userAgent.toLowerCase().indexOf('fir  
efox') !== -1)  
        {  
            return 'You are using Firefox';  
        }  
  
        if  
(navigator.userAgent.toLowerCase().indexOf('chro  
me') !== -1)  
        {  
            return 'You are using Chrome';  
        }  
  
        if  
(navigator.userAgent.toLowerCase().indexOf('sa  
fari') !== -1)  
        {  
            return 'You are using Safari';  
        }  
    }  
}
```

```
// if none of the above, display a generic  
message  
return 'No known browser detected';  
}  
  
console.log(detectWebBrowser());  
  
alert(detectWebBrowser());  
}());
```

```
javascript:(
/* Pythagorean Theorem */
function()
{
    /* create a function to calculate the
hypotenuse length */
    function calculateHypotenuse(a, b)
    {
        return Math.sqrt(a * a + b * b);
    }

    /* create a function to display the result */
    function displayResult(a, b, c)
    {
        alert(
            "Side A: " + a + "\n" +
            "Side B: " + b + "\n" +
            "Hypotenuse C: " + c.toFixed(2)
        );
    }

    /* prompt the user for the lengths of side A
and side B */
    const sideA = parseFloat(prompt("Enter the
length of side A:"));
}
```

```
const sideB = parseFloat(prompt("Enter the  
length of side B:"));  
  
/* check if the input is valid */  
if (isNaN(sideA) || isNaN(sideB))  
{  
    alert("Enter only valid numbers");  
}  
else  
{  
    /* calculate hypotenuse with the  
Pythagorean Theorem */  
    const hypotenuse =  
calculateHypotenuse(sideA, sideB);  
  
    /* display the result */  
    displayResult(sideA, sideB, hypotenuse);  
}  
});
```

```
javascript:(  
/* Calculate Factorial */  
function()  
{  
/* create a function to calculate the factorial */  
function calculateFactorial(whichNumber)  
{  
if (whichNumber < 0)  
{  
    return "The factorial is not defined for  
negative numbers";  
}  
else if (whichNumber === 0)  
{  
    return 1;  
}  
else  
{  
    let factorial = 1;  
  
for (let x = 1; x <= whichNumber; x++)  
{  
    factorial *= x;  
}  
  
return factorial;
```

```
    }
}

/* prompt the user for a number */
const number = parseInt(prompt("Enter a
non-negative integer to calculate its
factorial"));

/* check if the input is valid */
if (isNaN(number) || number < 0)
{
    alert("Enter a non-negative integer");
}
else
{
    /* calculate the factorial */
    const factorialResult =
calculateFactorial(number);

    /* display the result */
    alert("Factorial of " + number + " is: " +
factorialResult);
}

}());
```

```
javascript:(
/* Calculate Circle Circumference and Area */
function()
{
    function calculateCircleProperties()
    {
        let radius = parseFloat(prompt("Enter the
radius of the circle"));

        if (!isNaN(radius) && radius >= 0)
        {
            let area = Math.PI * Math.pow(radius, 2);

            let circumference = 2 * Math.PI * radius;

            alert(
                "Radius: " + radius.toFixed(2) + "\n" +
                "Area: " + area.toFixed(2) + "\n" +
                "Circumference: " +
                circumference.toFixed(2)
            );
        }
        else
        {
            alert("Enter a valid positive number for
the radius.");
        }
    }
}
```

```
    }  
}
```

```
calculateCircleProperties();  
}());
```

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```
javascript:(
/* Button Beep Sound using Oscillator */
function()
{
    /* create a button element */
    let button =
document.createElement('button');

    button.textContent = 'Click me for a beep';

    /* create a new AudioContext */
    let AudioContext = window.AudioContext ||
window.webkitAudioContext;

    let audioContext = new AudioContext();

    /* add click event to play the beep sound */
    button.addEventListener('click', function()
    {
        /* create oscillator node for the beep
sound */
        let oscillator =
audioContext.createOscillator();

        oscillator.type = 'sine';
    });
}
```

```
/* frequency of the beep sound */  
oscillator.frequency.value = 1000;  
  
oscillator.connect(audioContext.destination);  
  
oscillator.start();  
  
setTimeout(function()  
{  
    oscillator.stop();  
}, 100);  
});  
  
/* append the button to the body */  
document.body.append(button);  
  
}());
```

```
javascript:(
/* Draggable Square */
function()
{
    function createDraggableSquare()
    {
        let square =
document.createElement('div');
square.style.position = 'absolute';
square.style.left = '100px';
square.style.top = '100px';
square.style.width = '50px';
square.style.height = '50px';
square.style.backgroundColor = 'aqua';
square.style.cursor = 'move';

/* initialize variables for tracking the drag
state */
let isDragging = false;
let offsetX;
let offsetY;

/* function to handle mouse down event
and start dragging */
square.addEventListener('mousedown',
function(event)
```

```
{  
    isDragging = true;  
  
    offsetX = event.clientX -  
square.getBoundingClientRect().left;  
  
    offsetY = event.clientY -  
square.getBoundingClientRect().top;  
});  
  
/* function to handle mouse up event and  
stop dragging */  
window.addEventListener('mouseup',  
function()  
{  
    isDragging = false;  
});  
  
/* function to handle mouse move event  
and update square position */  
window.addEventListener('mousemove',  
function(event)  
{  
    if (isDragging)  
    {  
        let x = event.clientX - offsetX;
```

```
let y = event.clientY - offsetY;  
  
/* make sure the square stays within  
the viewport */  
x = Math.min(Math.max(x, 0),  
window.innerWidth - 50);  
  
y = Math.min(Math.max(y, 0),  
window.innerHeight - 50);  
  
square.style.left = x + 'px';  
square.style.top = y + 'px';  
}  
});  
  
document.body.append(square);  
}  
  
createDraggableSquare();  
  
}());
```

```
javascript:(
/* Drag any element on any webpage */
function()
{
    function makePageElementsDraggable()
    {
        let dragItem = null;
        let offsetX;
        let offsetY;

        document.addEventListener('mousedown',
        function(e)
        {
            dragItem = e.target;

            offsetX = e.clientX -
dragItem.getBoundingClientRect().left;

            offsetY = e.clientY -
dragItem.getBoundingClientRect().top;

            dragItem.style.position = 'absolute';
            document.body.append(dragItem);
        });
    }
}
```

```
document.addEventListener('mousemove',
function(e)
{
  if (dragItem)
  {
    dragItem.style.left = e.clientX -
offsetX + 'px';

    dragItem.style.top = e.clientY -
offsetY + 'px';
  }
});

document.addEventListener('mouseup',
function()
{
  dragItem = null;
});

makePageElementsDraggable();

});
```

```
javascript:(
/* Newton's First Law of Motion - The Law of Inertia.*/
function()
{
    function createMovingSquare()
    {
        let box = document.createElement("div");
        box.style.position = "absolute";
        box.style.top = "50px";
        box.style.left = "50px";
        box.style.width = "100px";
        box.style.height = "100px";
        box.style.backgroundColor = "aqua";
        document.body.append(box);

        /* starting velocity */
        let velocity = 1;

        function animate()
        {
            /* move the box horizontally */
            box.style.left = parseInt(box.style.left) +
velocity + "px";
        }
    }
}
```

```
/* check if the box has reached the right  
edge */  
if (parseInt(box.style.left) +  
parseInt(box.style.width) >=  
window.innerWidth)  
{  
    /* reverse direction */  
    velocity = -1;  
}  
  
/* check if the box has reached the left  
edge */  
if (parseInt(box.style.left) <= 0)  
{  
    /* reverse direction */  
    velocity = 1;  
}  
}  
  
let animationFrameId001;  
  
function gameLoop()  
{  
    animate();
```

```
animationFrameId001 =  
requestAnimationFrame(gameLoop);  
}  
  
gameLoop();  
}  
  
createMovingSquare();  
}());
```

/*
**Newton's First Law of Motion - an object will
keep going in its current state of motion
unless an external force acts on it.**

**In this script, the object continues moving
freely until it encounters the screen's edges.**

**When it hits a wall, it changes direction by
bouncing off with an equal and opposite force
to its original motion.**

*/

```
javascript:(  
/* Calculate Distance of Galactus to Earth */  
function()  
{  
    function calculateGalactusDistanceToEarth()  
{  
        /* starting distance in miles of Galactus to  
        Earth */  
        let distance = 1000000;  
  
        /* speed in mph - how fast Galactus is  
        traveling */  
        let speed = 10000;  
  
        /* update interval - how often to update us  
        on the distance */  
        let updateTime = 1 * 1000;  
  
        function updateDistance()  
        {  
            /* update distance */  
            distance -= speed / 60;  
  
            if (distance <= 0)  
            {  
                /* do something */  
            }  
        }  
    }  
}
```

```
document.getElementById("galactus-
update").innerHTML = "Galactus has arrived!";

    clearInterval(interval);
}
else
{
    document.getElementById("galactus-
update").innerHTML = "Galactus is " +
distance.toFixed(2) + " miles away.";
}

/*
 * create a div element for the updates */
let updateDiv =
document.createElement("div");
updateDiv.id = "galactus-update";
updateDiv.style.position = "fixed";
updateDiv.style.right = "10px";
updateDiv.style.bottom = "10px";
updateDiv.style.padding = "10px";
updateDiv.style.backgroundColor =
"rgba(0, 0, 0, 0.7)";
updateDiv.style.color = "white";
updateDiv.style.fontFamily = "Arial";
updateDiv.style.fontSize = "16px";
```

```
updateDiv.style.zIndex = "10000";
document.body.append(updateDiv);

/* update the distance initially */
updateDistance();

/* set up a timer to update the distance
every specified seconds */
let interval = setInterval(updateDistance,
updateTime);

}

calculateGalactusDistanceToEarth();

}());
```

Galactus is 945833.33 miles away.

```
javascript:(  
/* Calculate Distance of Galactus to Earth and  
How Long Until Arrival */  
function()  
{  
    function  
    calculateGalactusDistanceAndTimeToEarth()  
    {  
        /* starting distance in miles of Galactus to  
Earth */  
        let distance = 1000000;  
  
        /* speed in mph - how fast Galactus is  
traveling */  
        let speed = 10000;  
  
        /* update interval - how often to update us  
on the distance */  
        let updateTime = 1 * 1000;  
  
        function updateDistance()  
        {  
            /* update distance */  
            distance -= speed / 60;  
  
            if (distance <= 0)  
    
```

```
{  
    document.getElementById("galactus-update").innerHTML = "Galactus has arrived!";  
    clearInterval(interval);  
}  
else  
{  
    /* calculate time in hours */  
    let timeInHours = distance / speed;  
  
    /* convert time to hours and minutes */  
    let hours = Math.floor(timeInHours);  
  
    let minutes = Math.floor((timeInHours  
- hours) * 60);  
  
    document.getElementById("galactus-update").innerHTML =  
    "Galactus is " + distance.toFixed(2) +  
    " miles away.<br>Arrival in " +  
    hours + " hours and " + minutes + " minutes.";  
}  
}  
  
/* create a div element for the updates */
```

```
let updateDiv =  
document.createElement("div");  
updateDiv.id = "galactus-update";  
updateDiv.style.position = "fixed";  
updateDiv.style.right = "10px";  
updateDiv.style.bottom = "10px";  
updateDiv.style.padding = "10px";  
updateDiv.style.backgroundColor =  
"rgba(0, 0, 0, 0.7)";  
updateDiv.style.color = "white";  
updateDiv.style.fontFamily = "Arial";  
updateDiv.style.fontSize = "16px";  
updateDiv.style.zIndex = "10000";  
document.body.append(updateDiv);  
  
/* update the distance initially */  
updateDistance();  
  
/* set up a timer to update the distance  
every specified seconds */  
let interval = setInterval(updateDistance,  
updateTime);  
}  
  
calculateGalactusDistanceAndTimeToEarth();
```

}());

Galactus is 989500.00 miles away.
Arrival in 98 hours and 57 minutes.

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```
javascript:(
/* Square Expands with Each Click */
function()
{
    function createExpandingSquare()
    {
        /* create a square element */
        const square =
document.createElement('div');
        square.id = "square";
        square.style.position = "absolute";
        square.style.left = 100 + "px";
        square.style.top = 50 + "px";
        square.style.width = '100px';
        square.style.height = '100px';
        square.style.backgroundColor = 'aqua';
        square.style.transition = 'width 0.3s,
height 0.3s';
        square.style.cursor = 'pointer';

        /* starting width and height */
        let width = 100;
        let height = 100;

        /* add click event listener to grow the
square on each click */
    }
}
```

```
square.onclick = function()
{
    width += 20;
    height += 20;

    square.style.width = width + 'px';
    square.style.height = height + 'px';
};

/* add the square to the page */
document.body.append(square);
}

createExpandingSquare();
}());
```

```
javascript:(
/* Square Expands/Contracts by Click */
function()
{
    function
createExpandingContractingSquare()
{
    /* create a square element */
    const square =
document.createElement('div');
    square.id = 'square';
    square.style.position = 'absolute';
    square.style.left = '100px';
    square.style.top = '50px';
    square.style.width = '100px';
    square.style.height = '100px';
    square.style.backgroundColor = 'aqua';
    square.style.transition = 'width 0.3s,
height 0.3s';
    square.style.cursor = 'pointer';

    /* starting width and height */
    let width = 100;
    let height = 100;
```

```
/* initialize a variable to keep track of the  
direction (expanding or contracting) */  
let expanding = true;  
  
/* add click event listener to adjust the  
square's size */  
square.onclick = function()  
{  
    if (expanding)  
    {  
        width += 20;  
        height += 20;  
  
        if (width >= 300)  
        {  
            expanding = false;  
        }  
    }  
    else  
    {  
        width -= 20;  
        height -= 20;  
  
        if (width <= 100)  
        {  
            expanding = true;  
        }  
    }  
}
```

```
        }
    }

square.style.width = width + 'px';
square.style.height = height + 'px';
};

/* add the square to the page */
document.body.append(square);
}

createExpandingContractingSquare();

}());
```

```
javascript:(
/* Square Expands/Contracts by Timer */
function()
{
    function
createExpandingContractingSquare()
{
    /* create a square element */
    const square =
document.createElement('div');
    square.id = 'square';
    square.style.position = 'absolute';
    square.style.left = '100px';
    square.style.top = '50px';
    square.style.width = '100px';
    square.style.height = '100px';
    square.style.backgroundColor = 'aqua';
    square.style.transition = 'width 0.3s,
height 0.3s';
    square.style.cursor = 'pointer';

    /* stop the timer when the square is
clicked */
    square.onclick = function()
    {
        clearInterval(timerInterval);
    }
}
```

```
};
```

```
/* add the square to the page */  
document.body.append(square);
```

```
/*----*/
```

```
/* initialize width and height */
```

```
let width = 100;  
let height = 100;
```

```
/* initialize a variable to keep track of the  
direction (expanding or contracting) */  
let expanding = true;
```

```
function updateSquareSize()
```

```
{  
    if (expanding)  
    {  
        width += 20;  
        height += 20;
```

```
    if (width >= 300)  
    {  
        expanding = false;  
    }
```

```
        }
    else
    {
        width -= 20;
        height -= 20;

        if (width <= 100)
        {
            expanding = true;
        }
    }

    square.style.width = width + 'px';
    square.style.height = height + 'px';
}

/* set up a timer to update the square's
size every 1 second */
const timerInterval =
setInterval(updateSquareSize, 1000);
}

createExpandingContractingSquare();
```

```
});
```

```
javascript:(
/* Square Moves in Square Pattern by Timer */
function()
{
    function
createSquareMoveInSquarePattern()
{
    /* create a square element */
    let square =
document.createElement('div');
    square.style.position = 'absolute';
    square.style.left = '20px';
    square.style.top = '20px';
    square.style.width = '50px';
    square.style.height = '50px';
    square.style.backgroundColor = 'aqua';
    square.style.transition = 'transform 2s';

    /* initialize the starting position */
    let x = 20;
    let y = 20;

    /* 0 is right, 1 is down, 2 is left, 3 is up */
    let direction = 0;

    /* add the square to the page */
}
```

```
document.body.append(square);

/* function to move the square in a square
pattern */
function moveSquare()
{
    if (direction === 0)
    {
        x += 100;
    }
    else if (direction === 1)
    {
        y += 100;
    }
    else if (direction === 2)
    {
        x -= 100;
    }
    else if (direction === 3)
    {
        y -= 100;
    }

    square.style.transform = 'translate(' + x
+ 'px, ' + y + 'px)';
```

```
/* update direction */
direction = (direction + 1) % 4;
}

/* start moving the square */
moveSquare();

/* repeat square pattern continuously */
setInterval(moveSquare, 2000);
}

createSquareMoveInSquarePattern();

}());
```

```
javascript:(
/* Special Efx - when clicked div turns to
particles */
function()
{
    function makeClickableSpecialEfx()
    {
        let specialEfxBox =
document.createElement('div');
        specialEfxBox.style.position = 'absolute';
        specialEfxBox.style.left = "100px";
        specialEfxBox.style.top = "50px";
        specialEfxBox.style.width = '50px';
        specialEfxBox.style.height = '50px';
        specialEfxBox.style.backgroundColor =
'blue';
        specialEfxBox.style.cursor = 'pointer';

        specialEfxBox.onclick = function()
        {
            let particles = [];

            let amount = 500;

            for (let x = 0; x < amount; x++)
            {
```

```
let particle =  
document.createElement('div');  
particle.style.position = 'absolute';  
particle.style.width = '5px';  
particle.style.height = '5px';  
particle.style.backgroundColor =  
'aqua';  
particle.style.animation = 'explode 1s  
ease-in-out';  
  
/* random X coordinate within a range */  
let randomX = Math.random() * 200 - 100;  
  
/* random Y coordinate within a range */  
let randomY = Math.random() * 200 - 100;  
  
particle.style.left =  
specialEfxBox.getBoundingClientRect().left +  
randomX + 'px';  
  
particle.style.top =  
specialEfxBox.getBoundingClientRect().top +  
randomY + 'px';  
  
particles.push(particle);
```

```
    document.body.append(particle);
}

/* hide the original div */
specialEfxBox.style.display = 'none';

setTimeout(function()
{
    for (var i = 0; i < particles.length; i++)
    {
        /* remove particles after the
animation */
        particles[i].remove();
    }
}, 1000);
};

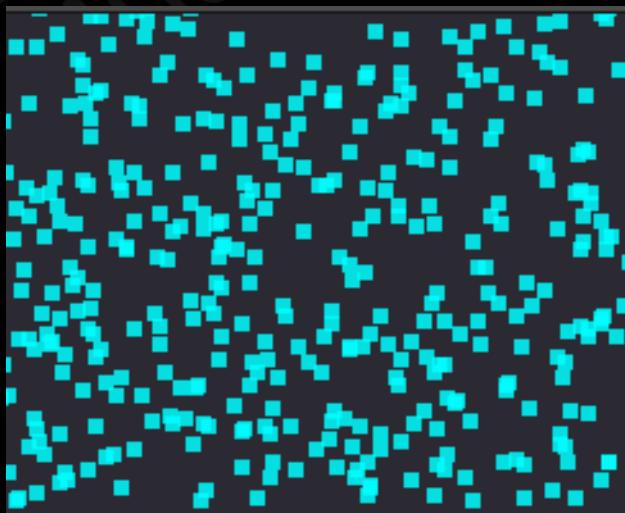
document.body.append(specialEfxBox);

/*----*/

let style001 =
document.createElement('style');

style001.innerHTML = `
@keyframes explode {`
```

```
0% {  
    opacity: 1;  
    transform: scale(1);  
}  
100% {  
    opacity: 0;  
    transform: scale(2);  
}  
};  
  
document.head.append(style001);  
}  
  
makeClickableSpecialEfx();  
  
}());
```



```
javascript:(
/* Special Efx - Random Color Squares */
function()
{
    function makeClickableSpecialEfx()
    {
        let specialEfxBox =
document.createElement('div');
        specialEfxBox.style.position = 'absolute';
        specialEfxBox.style.left = '100px';
        specialEfxBox.style.top = '50px';
        specialEfxBox.style.width = '50px';
        specialEfxBox.style.height = '50px';
        specialEfxBox.style.backgroundColor =
'blue';
        specialEfxBox.style.cursor = 'pointer';

        specialEfxBox.onclick = function()
        {
            let particles = [];

            let amount = 500;

            for (let x = 0; x < amount; x++)
            {
```

```
let particle =  
document.createElement('div');  
particle.style.position = 'absolute';  
particle.style.width = '10px';  
particle.style.height = '10px';  
particle.style.backgroundColor =  
getRandomColor();  
particle.style.animation = 'explode 1s  
ease-in-out';  
  
/* random X coordinate within a range */  
let randomX = Math.random() * 200 -  
100;  
  
/* random Y coordinate within a range */  
let randomY = Math.random() * 200 -  
100;  
  
particle.style.left =  
specialEfxBox.getBoundingClientRect().left +  
randomX + 'px';  
  
particle.style.top =  
specialEfxBox.getBoundingClientRect().top +  
randomY + 'px';
```

```
particles.push(particle);

document.body.append(particle);
}

/* hide the original div */
specialEfxBox.style.display = 'none';

setTimeout(function()
{
    for (var i = 0; i < particles.length; i++)
    {
        /* remove particles after the
animation */
        particles[i].remove();
    }
}, 500);
};

document.body.append(specialEfxBox);

/*----*/
```

```
let style001 =
document.createElement('style');
```

```
style001.innerHTML = `

  @keyframes explode {
    0% {
      opacity: 1;
      transform: scale(1);
    }
    100% {
      opacity: 0;
      transform: scale(5);
    }
  };
}

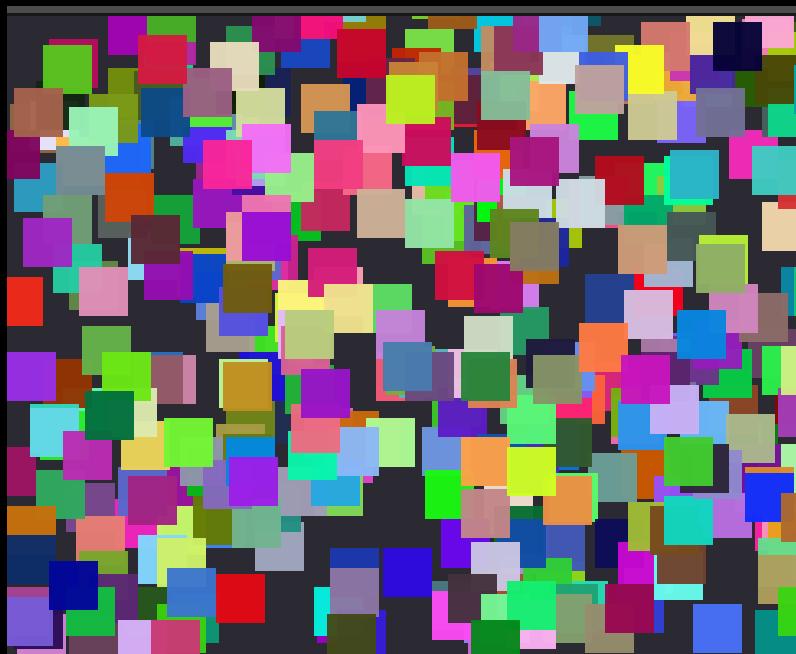
document.head.append(style001);

function getRandomColor()
{
  let r = Math.floor(Math.random() * 255);
  let g = Math.floor(Math.random() * 255);
  let b = Math.floor(Math.random() * 255);

  return `rgb(${r}, ${g}, ${b})`;
}

makeClickableSpecialEfx();
```

}());



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```
javascript:(
/* Special Efx - Circles Random Color and Size */
function()
{
    function makeClickableSpecialEfx()
    {
        let specialEfxBox =
document.createElement('div');
        specialEfxBox.style.position = 'absolute';
        specialEfxBox.style.left = '100px';
        specialEfxBox.style.top = '50px';
        specialEfxBox.style.width = '100px';
        specialEfxBox.style.height = '100px';
        specialEfxBox.style.backgroundColor =
'blue';
        specialEfxBox.style.cursor = 'pointer';

        specialEfxBox.onclick = function()
        {
            let particles = [];

            let amount = 500;

            for (let x = 0; x < amount; x++)
            {

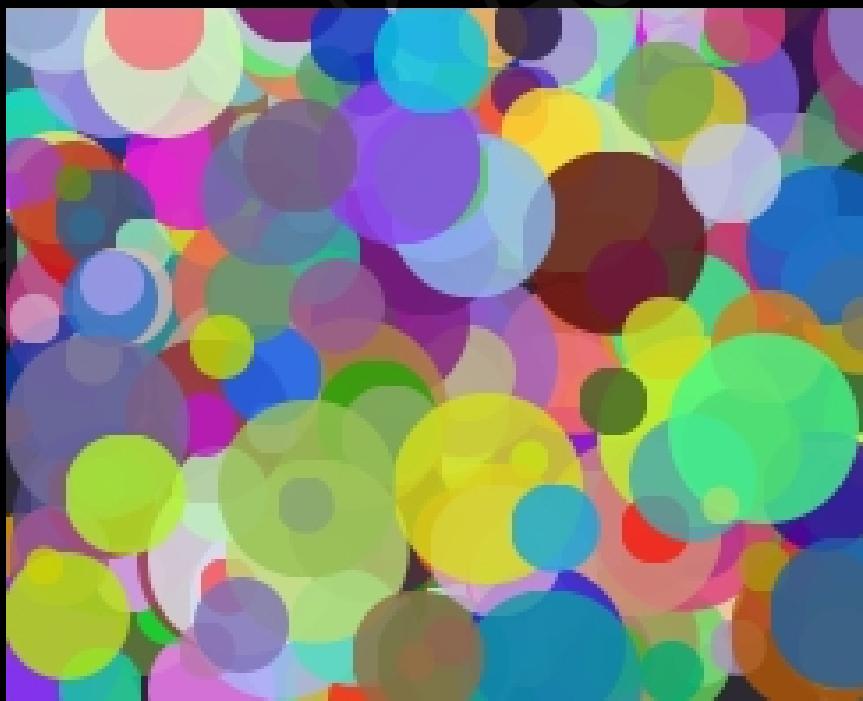
```

```
let particle =  
document.createElement('div');  
particle.style.position = 'absolute';  
  
/* get a random size for the circle */  
let size = getRandomSize();  
  
particle.style.width = size + 'px';  
particle.style.height = size + 'px';  
/* make it a circle */  
particle.style.borderRadius = '50%';  
particle.style.backgroundColor =  
getRandomColor();  
particle.style.animation = 'explode 1s  
ease-in-out';  
  
/* random X coordinate within a range */  
let randomX = Math.random() * 200 -  
100;  
  
/* random Y coordinate within a range */  
let randomY = Math.random() * 200 -  
100;  
particle.style.left =  
specialEfxBox.getBoundingClientRect().left +  
randomX + 'px';
```

```
particle.style.top =  
specialEfxBox.getBoundingClientRect().top +  
randomY + 'px';  
  
particles.push(particle);  
  
document.body.append(particle);  
}  
  
/* hide the original div */  
specialEfxBox.style.display = 'none';  
  
setTimeout(function()  
{  
    for (var i = 0; i < particles.length; i++)  
    {  
        /* remove particles after the  
animation */  
        particles[i].remove();  
    }  
}, 500);  
};  
  
document.body.append(specialEfxBox);
```

```
/*----*/  
  
let style001 =  
document.createElement('style');  
  
style001.innerHTML = `  
@keyframes explode {  
0% {  
    opacity: 1;  
    transform: scale(1);  
}  
100% {  
    opacity: 0;  
    transform: scale(5);  
}  
};  
  
document.head.append(style001);  
  
}  
  
function getRandomColor()  
{  
    let r = Math.floor(Math.random() * 255);  
    let g = Math.floor(Math.random() * 255);  
    let b = Math.floor(Math.random() * 255);  
}
```

```
    return 'rgb('+r+', '+g+', '+b+')';  
}  
  
/* function to get a random size for circle */  
function getRandomSize()  
{  
    return Math.floor(Math.random() * 20) + 5;  
}  
  
makeClickableSpecialEfx();  
  
}());
```



```
javascript:(
/* Special Efx - Circles in a Circle */
function()
{
    function makeClickableSpecialEfx()
    {
        let specialEfxBox =
document.createElement('div');
        specialEfxBox.style.position = 'absolute';
        specialEfxBox.style.left = '50%';
        specialEfxBox.style.top = '50%';
        specialEfxBox.style.transform =
'translate(-50%, -50%)';
        specialEfxBox.style.width = '50px';
        specialEfxBox.style.height = '50px';
        specialEfxBox.style.backgroundColor =
'blue';
        /* make it a circle */
        specialEfxBox.style.borderRadius = '50%';
        specialEfxBox.style.cursor = 'pointer';

        specialEfxBox.onclick = function()
        {
            let particles = [];
            let amount = 500;
```

```
for (let angle = 0; angle < 360; angle +=  
360 / amount)  
{  
    let particle =  
document.createElement('div');  
    particle.style.position = 'absolute';  
    particle.style.width = '50px';  
    particle.style.height = '50px';  
    /* make it a circle */  
    particle.style.borderRadius = '50%';  
    particle.style.backgroundColor =  
getRandomColor();  
    particle.style.animation = 'explode 1s  
ease-in-out';  
  
    let radius = 200;  
    /*----*/  
  
    let x = Math.cos((angle * Math.PI) /  
180) * radius;  
  
    let y = Math.sin((angle * Math.PI) /  
180) * radius;
```

```
/*----*/  
  
particle.style.left = 'calc(50% + ' + x +  
'px');  
  
particle.style.top = 'calc(50% + ' + y +  
'px');  
  
/*----*/  
  
particles.push(particle);  
  
document.body.append(particle);  
}  
  
/* hide the original div */  
specialEfxBox.style.display = 'none';  
  
setTimeout(function()  
{  
    for (let i = 0; i < particles.length; i++)  
    {  
        /* remove particles after the  
animation */  
        particles[i].remove();  
    }  
},
```

```
    }, 500);  
};
```

```
document.body.append(specialEfBox);
```

```
/*----*/
```

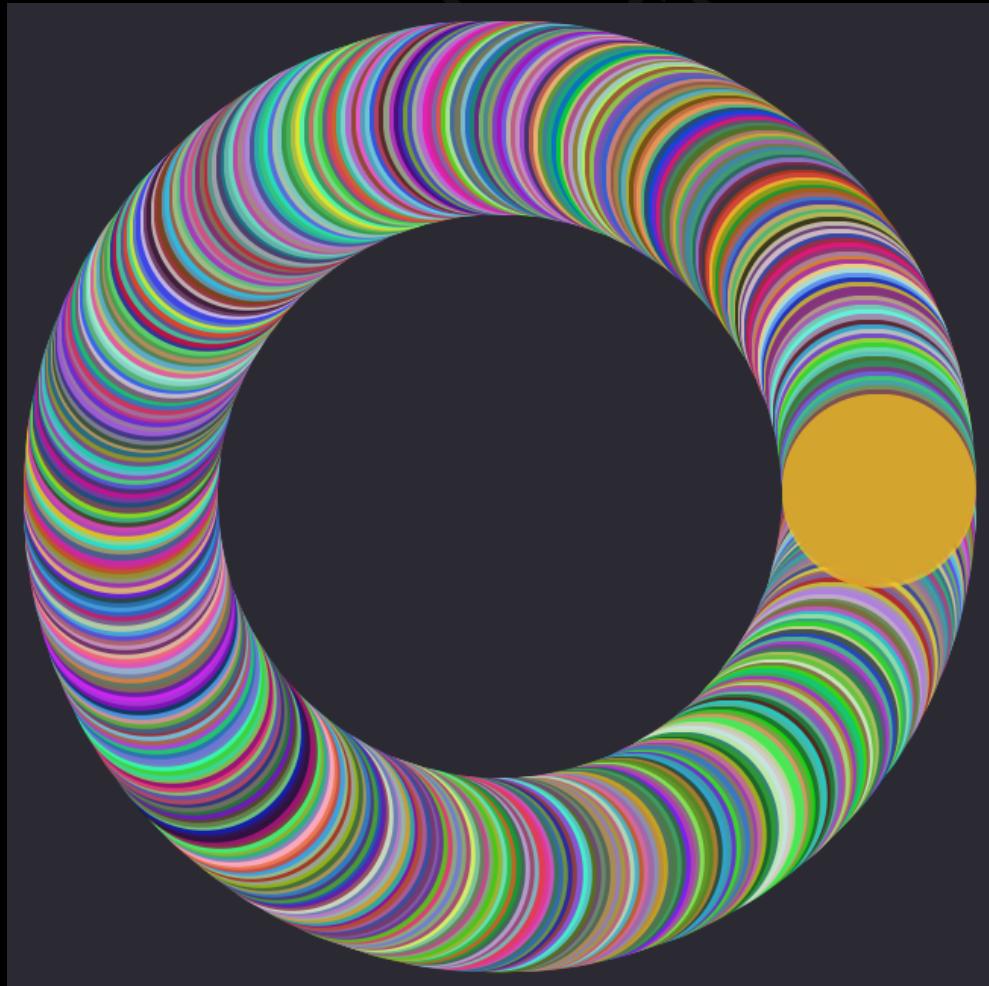
```
let style001 =  
document.createElement('style');
```

```
style001.innerHTML = `  
@keyframes explode {  
0% {  
    opacity: 1;  
    transform: scale(1);  
}  
100% {  
    opacity: 0;  
    transform: scale(5);  
}  
};`;
```

```
document.head.append(style001);  
}
```

```
function getRandomColor()
```

```
{  
  let r = Math.floor(Math.random() * 255);  
  let g = Math.floor(Math.random() * 255);  
  let b = Math.floor(Math.random() * 255);  
  
  return 'rgb('+r+', '+g+', '+b+')';  
}  
  
makeClickableSpecialEfx();  
  
}());
```



```
javascript:(
/* Special Efx - Circle Expands */
function()
{
    function makeSpecialEfx()
    {
        let particles = [];

        let amount = 1000;

        for (let angle = 0; angle < 360; angle += 360 / amount)
        {
            let particle =
document.createElement('div');
            particle.style.position = 'absolute';
            particle.style.width = '50px';
            particle.style.height = '50px';
            particle.style.borderRadius = "50%";
            particle.style.backgroundColor = 'aqua';
            particle.style.animation = 'explode 1s
ease-in-out';

            /* start particles from the center */
            let radius = 0;
```

```
/*----*/  
  
let x = Math.cos((angle * Math.PI) / 180) *  
radius;  
  
let y = Math.sin((angle * Math.PI) / 180) *  
radius;  
  
/*----*/  
  
particle.style.left = 'calc(50% + ' + x +  
'px)';  
  
particle.style.top = 'calc(50% + ' + y +  
'px)';  
  
/*----*/  
  
particles.push(particle);  
  
document.body.append(particle);  
}  
  
setTimeout(function()  
{  
    for (let i = 0; i < particles.length; i++)
```

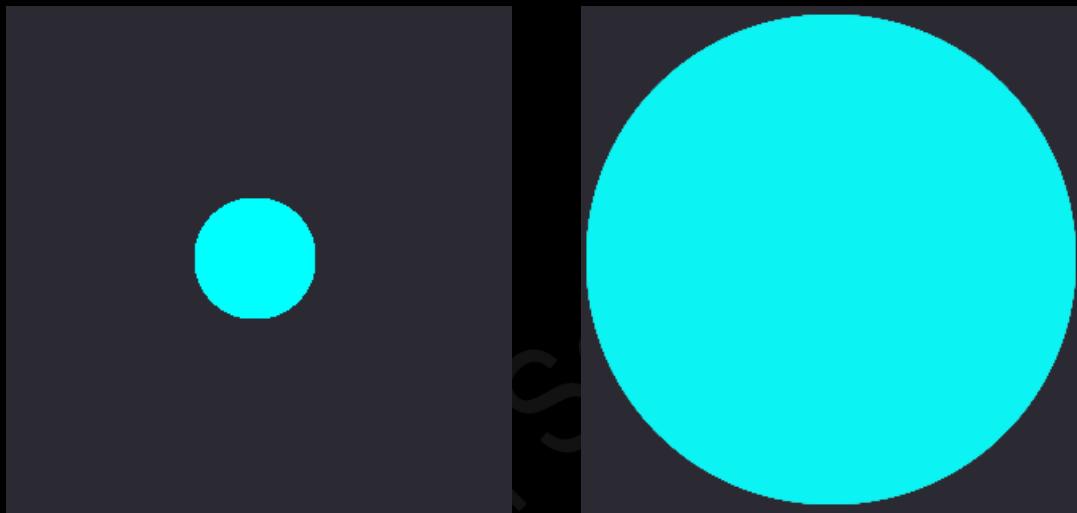
```
{  
    /* remove particles after the  
animation */  
    particles[i].remove();  
}  
, 1000);  
}  
  
/*-----*/
```

```
let style001 =  
document.createElement('style');
```

```
style001.innerHTML =`  
@keyframes explode {  
0% {  
    opacity: 1;  
    transform: scale(1);  
}  
100% {  
    opacity: 0;  
    transform: scale(5);  
}  
};`;
```

```
document.head.append(style001);
```

```
makeSpecialEfx();  
});
```



```
/*  
The Circle expands with a smooth animations  
*/
```

```
javascript:(
/* Special Efx - Circle Expands to Concentric Circles */
function()
{
    function makeSpecialEfx()
    {
        let circles = [];

        /* number of concentric circles */
        let numCircles = 10;

        /* initial size of the innermost circle */
        let circleSize = 50;

        for (let i = 0; i < numCircles; i++)
        {
            let circle =
                document.createElement('div');
                circle.style.position = 'absolute';
                circle.style.width = circleSize + 'px';
                circle.style.height = circleSize + 'px';
                circle.style.borderRadius = '50%';
                circle.style.backgroundColor = 'aqua';
                circle.style.animation = 'expandCircle
1s ease-in-out';
    }
}
```

```
/*----*/  
  
/* calculate the position to center the  
circles */  
let leftPosition = (window.innerWidth -  
circleSize) / 2;  
  
let topPosition = (window.innerHeight -  
circleSize) / 2;  
  
/*----*/  
  
circle.style.left = leftPosition + 'px';  
circle.style.top = topPosition + 'px';  
  
/*----*/  
  
/* increase the circle size for the next  
concentric circle */  
circleSize += 50;  
  
circles.push(circle);  
  
document.body.append(circle);  
}  
}
```

```
setTimeout(function()
{
    for (let i = 0; i < circles.length; i++)
    {
        /* remove circles after the animation */
        circles[i].remove();
    }
}, 1000);
}

/*----*/

let style001 =
document.createElement('style');

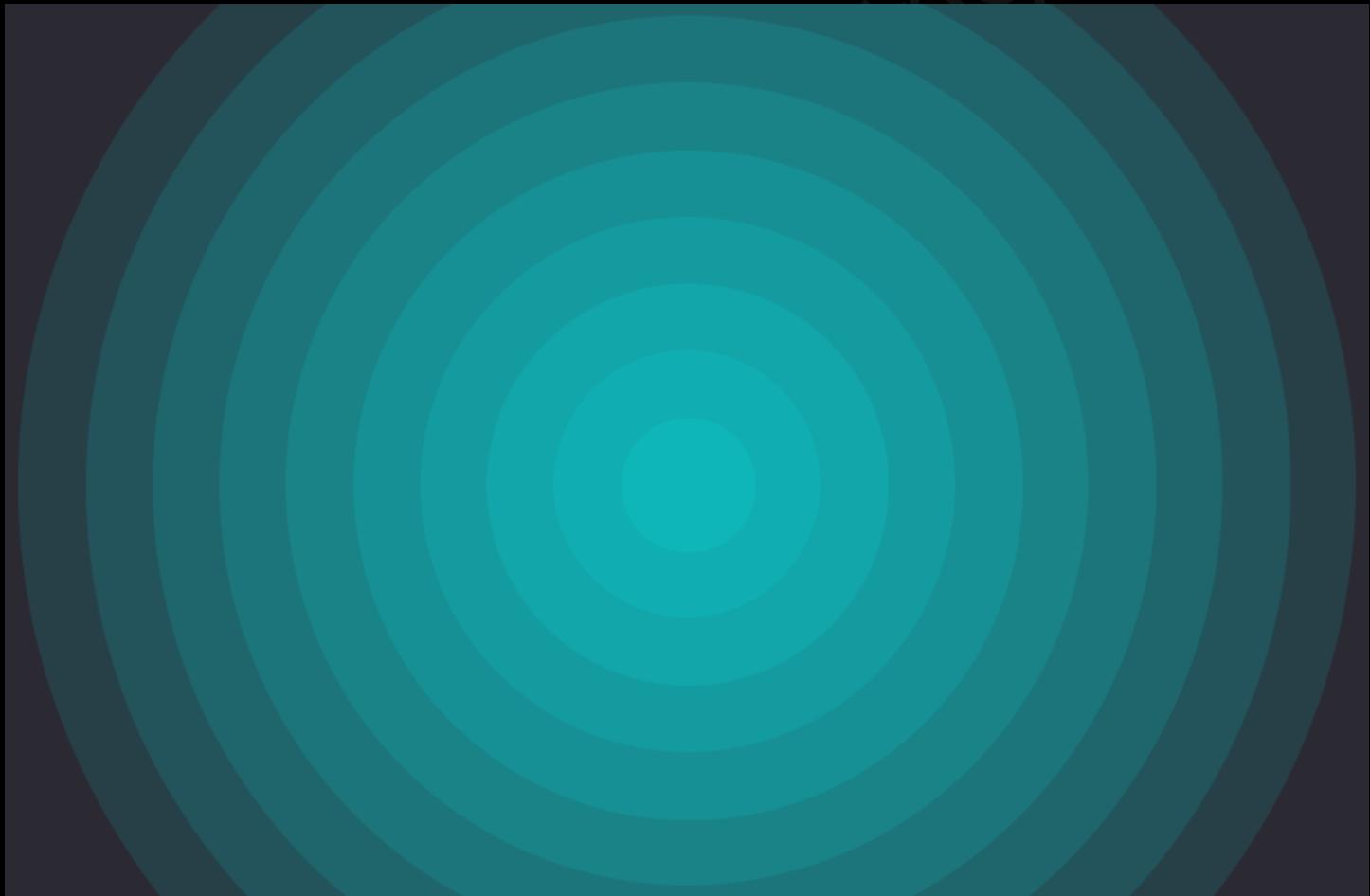
style001.innerHTML = `
@keyframes expandCircle {
0% {
    opacity: 1;
    transform: scale(1);
}
100% {
    opacity: 0;
    transform: scale(1.5);
}
`
```

}`;

document.head.append(style001);

makeSpecialEfx();

})();



```
javascript:(  
/* Special Efx - Array of Objects - Random  
Choice */  
function()  
{  
    function generateSpecialEffects()  
{  
        let specialEfx =  
        [  
            {  
                name: 'Effect 1',  
                color: 'aqua',  
                size: 50,  
            },  
            {  
                name: 'Effect 2',  
                color: 'yellow',  
                size: 200,  
            },  
            {  
                name: 'Effect 3',  
                color: 'blue',  
                size: 400,  
            },  
        ]  
        return specialEfx[Math.floor(Math.random() * specialEfx.length)];  
    }  
}  
)
```

```
];

function createRandomEfx()
{
    let whichArray = specialEfx;

    let randomIndex =
Math.floor(Math.random() * whichArray.length);

    let effectChosen =
whichArray[randomIndex];

/*----*/

    let particle =
document.createElement('div');
    particle.style.position = 'absolute';
    particle.style.width = effectChosen.size
+ 'px';
    particle.style.height = effectChosen.size
+ 'px';
    particle.style.borderRadius = '50%';
    particle.style.backgroundColor =
effectChosen.color;
    particle.style.animation = 'expandCircle
1s ease-in-out';
```

```
/*----*/  
  
/* calculate the position to center the  
circle */  
let leftPosition = (window.innerWidth -  
effectChosen.size) / 2;  
  
let topPosition = (window.innerHeight -  
effectChosen.size) / 2;  
  
/*----*/  
  
particle.style.left = leftPosition + 'px';  
particle.style.top = topPosition + 'px';  
  
/*----*/  
  
document.body.append(particle);  
  
setTimeout(function()  
{  
    /* remove the particle after the  
animation */  
    particle.remove();  
}, 700);
```

```
}
```

```
/*----*/
```

```
let style001 =  
document.createElement('style');
```

```
style001.innerHTML = `  
@keyframes expandCircle {  
0% {  
    opacity: 1;  
    transform: scale(1);  
}  
100% {  
    opacity: 0;  
    transform: scale(1.5);  
}  
};`
```

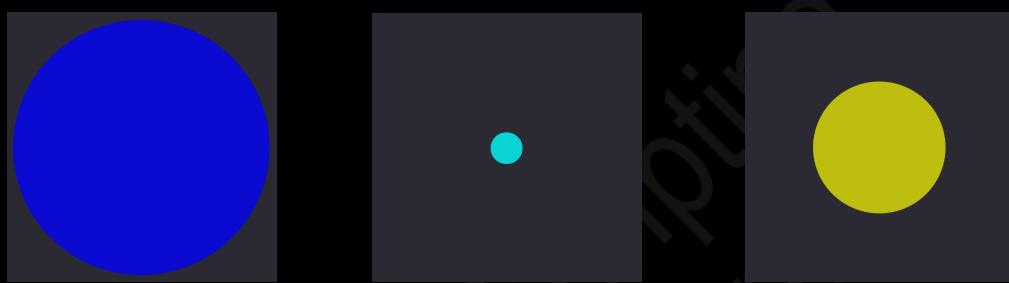
```
document.head.append(style001);
```

```
/* timer to create random efx at regular  
intervals */  
setInterval(function()  
{  
    createRandomEfx(specialEfx);  
}
```

```
 }, 2000);  
}
```

```
generateSpecialEffects();
```

```
}());
```



```
javascript:(
/* Cards - Shuffle Deck - Create the deck as an
Array */
function()
{
    function shuffleDeck()
    {
        const suits = ['Hearts', 'Diamonds',
'Clubs', 'Spades'];

        const values = ['2', '3', '4', '5', '6', '7', '8', '9',
'10', 'Jack', 'Queen', 'King', 'Ace'];

        const deck = [];

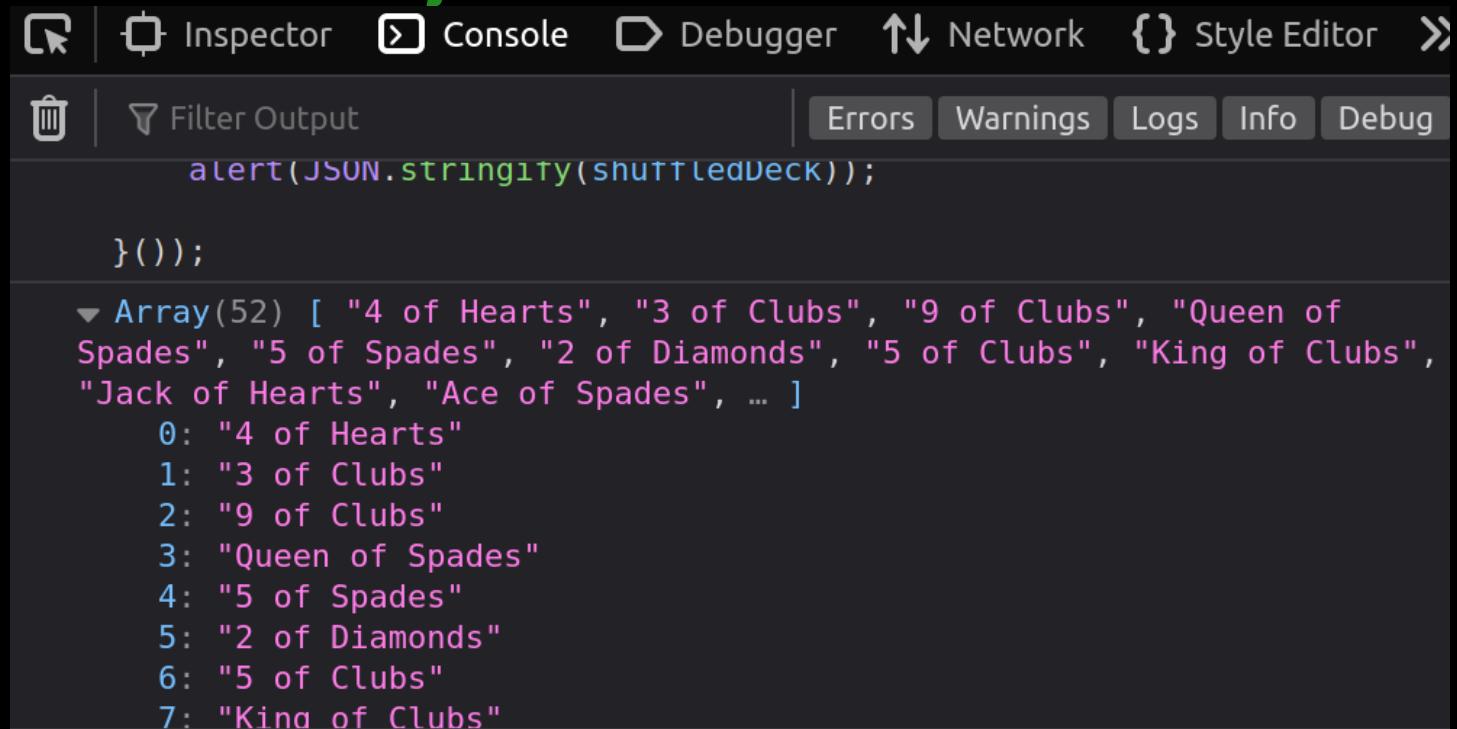
        /* create the deck as an array */
        for (let i = 0; i < suits.length; i++)
        {
            for (let j = 0; j < values.length; j++)
            {
                deck.push(values[j] + ' of ' + suits[i]);
            }
        }

        /* shuffle the deck */
        for (let i = 0; i < deck.length - 1; i++)
```

```
{  
    let j = i + Math.floor(Math.random() *  
(deck.length - i));  
  
    /* swap the elements at indices i and j */  
    let temp = deck[i];  
  
    deck[i] = deck[j];  
  
    deck[j] = temp;  
}  
  
return deck;  
}  
  
let shuffledDeck = shuffleDeck();  
  
/* show as objects */  
console.log(shuffledDeck);  
  
/* show as JSON */  
console.log(JSON.stringify(shuffledDeck));  
  
/* show as JSON */  
alert(JSON.stringify(shuffledDeck));
```

}());

/* show as Objects */



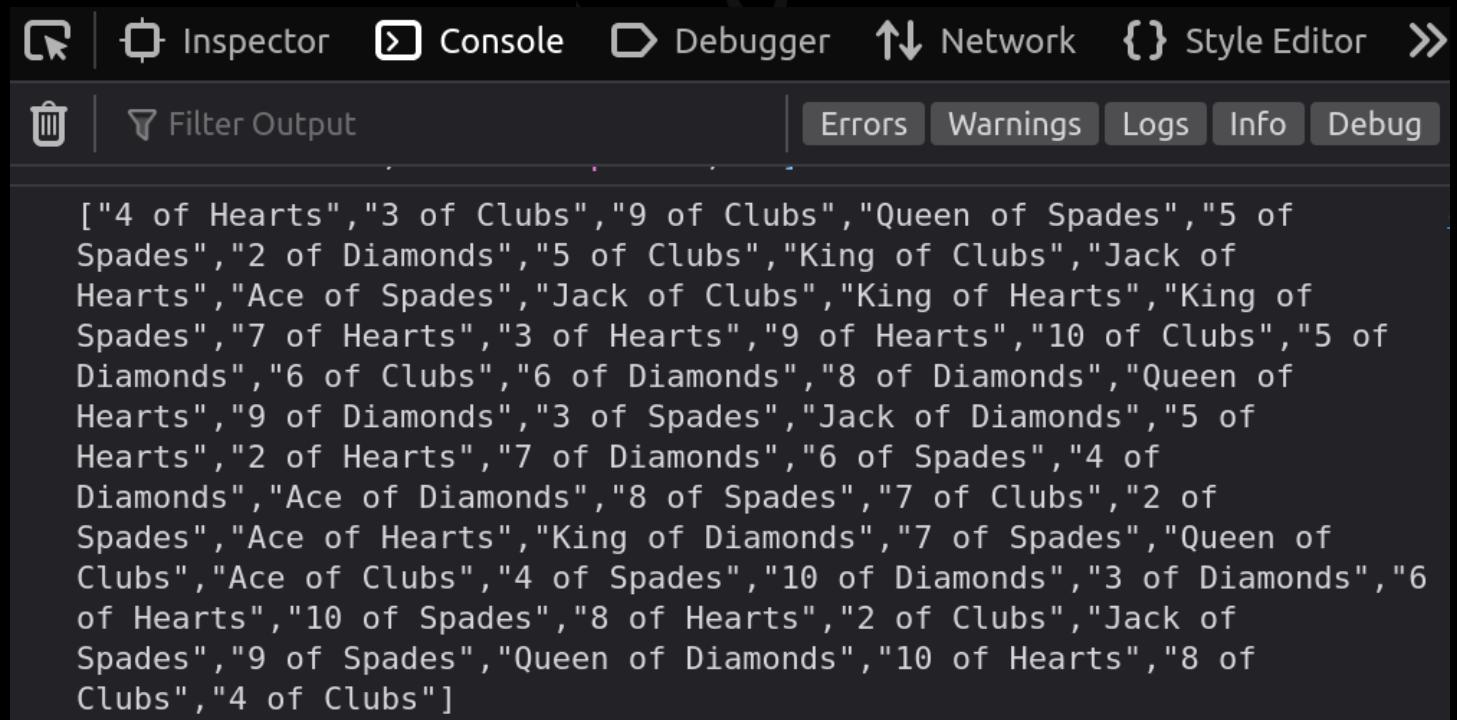
The screenshot shows a browser developer tools interface with the "Console" tab selected. The code `alert(JSON.stringify(shuffledDeck));` is run, and the output is displayed as an array of 52 objects, each representing a card with its name.

```

[{"name": "4 of Hearts"}, {"name": "3 of Clubs"}, {"name": "9 of Clubs"}, {"name": "Queen of Spades"}, {"name": "5 of Spades"}, {"name": "2 of Diamonds"}, {"name": "5 of Clubs"}, {"name": "King of Clubs"}, {"name": "Jack of Hearts"}, {"name": "Ace of Spades"}, ...]
  0: "4 of Hearts"
  1: "3 of Clubs"
  2: "9 of Clubs"
  3: "Queen of Spades"
  4: "5 of Spades"
  5: "2 of Diamonds"
  6: "5 of Clubs"
  7: "King of Clubs"
  ...

```

/* show as JSON */



The screenshot shows a browser developer tools interface with the "Console" tab selected. The code `JSON.stringify(shuffledDeck)` is run, and the output is a single JSON string containing all the card names from the previous example.

```

["4 of Hearts", "3 of Clubs", "9 of Clubs", "Queen of Spades", "5 of Spades", "2 of Diamonds", "5 of Clubs", "King of Clubs", "Jack of Hearts", "Ace of Spades", "Jack of Clubs", "King of Hearts", "King of Spades", "7 of Hearts", "3 of Hearts", "9 of Hearts", "10 of Clubs", "5 of Diamonds", "6 of Clubs", "6 of Diamonds", "8 of Diamonds", "Queen of Hearts", "9 of Diamonds", "3 of Spades", "Jack of Diamonds", "5 of Hearts", "2 of Hearts", "7 of Diamonds", "6 of Spades", "4 of Diamonds", "Ace of Diamonds", "8 of Spades", "7 of Clubs", "2 of Spades", "Ace of Hearts", "King of Diamonds", "7 of Spades", "Queen of Clubs", "Ace of Clubs", "4 of Spades", "10 of Diamonds", "3 of Diamonds", "6 of Hearts", "10 of Spades", "8 of Hearts", "2 of Clubs", "Jack of Spades", "9 of Spades", "Queen of Diamonds", "10 of Hearts", "8 of Clubs", "4 of Clubs"]

```

```
javascript:(
/* Cards - Shuffle Deck - Create the deck as an
Array - Rows of 4 */
function()
{
    function shuffleDeck()
    {
        const suits = ['Hearts', 'Diamonds',
'Clubs', 'Spades'];

        const values = ['2', '3', '4', '5', '6', '7', '8', '9',
'10', 'Jack', 'Queen', 'King', 'Ace'];

        const deck = [];

        /* create the deck */
        for (let i = 0; i < suits.length; i++)
        {
            for (let j = 0; j < values.length; j++)
            {
                deck.push(values[j] + ' of ' + suits[i]);
            }
        }

        /* shuffle the deck */
        for (let i = 0; i < deck.length - 1; i++)
```

```
{  
    let j = i + Math.floor(Math.random() *  
(deck.length - i));  
  
    /* swap the elements at indices i and j */  
    let temp = deck[i];  
  
    deck[i] = deck[j];  
  
    deck[j] = temp;  
}  
  
return deck;  
}  
  
let shuffledDeck = shuffleDeck();  
  
/* create a container div to hold the cards */  
let container =  
document.createElement('div');  
container.style.position = "absolute";  
container.style.left = "100px";  
container.style.top = "10px";  
container.style.display = 'grid';  
container.style.gridTemplateColumns =  
'repeat(4, 1fr');
```

```
container.style.gridGap = '10px';
container.style.margin = '20px';

/* add each card to the container */
for (let i = 0; i < shuffledDeck.length; i++)
{
    let cardDiv =
        document.createElement('div');
    cardDiv.textContent = shuffledDeck[i];
    cardDiv.style.padding = '10px';
    cardDiv.style.border = '1px solid';
    cardDiv.style.borderColor = 'rgb(255, 255,
255)';
    cardDiv.style.borderRadius = '5px';
    cardDiv.style.fontSize = '20px';
    cardDiv.style.textAlign = 'center';
    container.append(cardDiv);
}

/* append the container to the body */
document.body.append(container);

}());
```

King of Spades	King of Clubs	6 of Diamonds	3 of Spades
9 of Clubs	5 of Diamonds	8 of Diamonds	Jack of Diamonds
10 of Hearts	Jack of Spades	3 of Diamonds	6 of Clubs
5 of Spades	Jack of Hearts	10 of Clubs	Queen of Hearts
Jack of Clubs	7 of Hearts	Ace of Diamonds	7 of Diamonds
8 of Clubs	7 of Spades	Ace of Hearts	4 of Spades
2 of Clubs	3 of Clubs	King of Diamonds	4 of Diamonds
5 of Hearts	4 of Hearts	9 of Hearts	Queen of Diamonds
6 of Hearts	5 of Clubs	2 of Spades	10 of Spades
2 of Diamonds	10 of Diamonds	Queen of Clubs	8 of Hearts
9 of Diamonds	Ace of Clubs	8 of Spades	King of Hearts
Ace of Spades	9 of Spades	4 of Clubs	2 of Hearts
6 of Spades	Queen of Spades	7 of Clubs	3 of Hearts

```
javascript:(
/* Cards - Shuffle Deck - Create the deck as an
Array of Objects */
function()
{
    function shuffleDeck()
    {
        const suits = ['Hearts', 'Diamonds',
'Clubs', 'Spades'];

        const values = ['2', '3', '4', '5', '6', '7', '8', '9',
'10', 'Jack', 'Queen', 'King', 'Ace'];

        const deck = [];

        /* create the deck as an array of objects */
        for (let i = 0; i < suits.length; i++)
        {
            for (let j = 0; j < values.length; j++)
            {
                deck.push(
                {
                    suit: suits[i],
                    number: values[j]
                });
            }
        }
    }
}
```

```
}
```

```
/* shuffle the deck */  
for (let i = 0; i < deck.length - 1; i++)  
{  
    let j = i + Math.floor(Math.random() *  
(deck.length - i));  
  
    let temp = deck[i];  
  
    deck[i] = deck[j];  
  
    deck[j] = temp;  
}  
  
return deck;  
}
```

```
let shuffledDeck = shuffleDeck();
```

```
/* show as objects */  
console.log(shuffledDeck);
```

```
/* show as JSON */  
console.log(JSON.stringify(shuffledDeck));
```

```
/* show as JSON */
alert(JSON.stringify(shuffledDeck));

}());
```

/* show as Objects */

The screenshot shows a browser's developer tools interface with the "Console" tab selected. The output area displays a hierarchical representation of an array. At the top level, it shows "Array(52) [...]". Below this, six individual objects are expanded, each representing a card with properties "suit" and "number".

```
Array(52) [ {...}, {...}, {...}, {...}, {...}, {...}, {...}, {...}, {...}, {...}, {...}, {...}, {...}, ... ]
  ▶ 0: Object { suit: "Hearts", number: "8" }
  ▶ 1: Object { suit: "Spades", number: "Jack" }
  ▶ 2: Object { suit: "Spades", number: "10" }
  ▶ 3: Object { suit: "Hearts", number: "Jack" }
  ▶ 4: Object { suit: "Spades", number: "7" }
  ▶ 5: Object { suit: "Diamonds", number: "5" }
```

/* show as JSON */

The screenshot shows a browser's developer tools interface with the "Console" tab selected. The output area displays a single JSON string representing the array of cards.

```
[{"suit": "Hearts", "number": "8"}, {"suit": "Spades", "number": "Jack"}, {"suit": "Spades", "number": "10"}, {"suit": "Hearts", "number": "Jack"}, {"suit": "Spades", "number": "7"}, {"suit": "Diamonds", "number": "5"}, {"suit": "Clubs", "number": "6"}, {"suit": "Clubs", "number": "4"}, {"suit": "Spades", "number": "King"}]
```

```
javascript:(
/* Cards - Shuffle Deck - Create the deck as an
Array of Objects - Rows of 4 */
function()
{
    function shuffleDeck()
    {
        const suits = ['Hearts', 'Diamonds',
'Clubs', 'Spades'];

        const values = ['2', '3', '4', '5', '6', '7', '8', '9',
'10', 'Jack', 'Queen', 'King', 'Ace'];

        const deck = [];

        /* create the deck as an array of objects */
        for (let i = 0; i < suits.length; i++)
        {
            for (let j = 0; j < values.length; j++)
            {
                deck.push(
                {
                    suit: suits[i],
                    number: values[j]
                });
            }
        }
    }
}
```

```
}

/* shuffle the deck */
for (let i = 0; i < deck.length - 1; i++)
{
    let j = i + Math.floor(Math.random() *
(deck.length - i));

    let temp = deck[i];

    deck[i] = deck[j];

    deck[j] = temp;
}

return deck;
}

let shuffledDeck = shuffleDeck();

/* show as objects */
console.log(shuffledDeck);

/* show as JSON */
console.log(JSON.stringify(shuffledDeck));
```

```
/*----*/  
  
/* create a container div to hold the cards */  
let container =  
document.createElement('div');  
container.style.position = "absolute";  
container.style.left = "100px";  
container.style.top = "10px";  
container.style.display = 'grid';  
container.style.gridTemplateColumns =  
'repeat(4, 1fr)';  
container.style.gridGap = '10px';  
container.style.margin = '20px';  
  
/* add each card to the container */  
for (let i = 0; i < shuffledDeck.length; i++)  
{  
    let cardDiv =  
document.createElement('div');  
    cardDiv.textContent =  
shuffledDeck[i].number + " of " +  
shuffledDeck[i].suit;  
    cardDiv.style.padding = '10px';  
    cardDiv.style.border = '1px solid';  
    cardDiv.style.borderColor = 'rgb(255, 255,  
255)';
```

```
cardDiv.style.borderRadius = '5px';
cardDiv.style.fontSize = '20px';
cardDiv.style.textAlign = 'center';
container.append(cardDiv);
}

/* append the container to the body */
document.body.append(container);

}());
```

Queen of Clubs	4 of Diamonds	Ace of Hearts	2 of Diamonds
Ace of Diamonds	Queen of Diamonds	King of Clubs	4 of Spades
2 of Clubs	Ace of Spades	4 of Clubs	Jack of Diamonds
Jack of Spades	Jack of Clubs	9 of Spades	8 of Clubs
3 of Spades	9 of Clubs	5 of Spades	Jack of Hearts
7 of Clubs	3 of Diamonds	9 of Diamonds	7 of Hearts
King of Diamonds	8 of Diamonds	6 of Hearts	9 of Hearts
5 of Clubs	5 of Hearts	3 of Hearts	Ace of Clubs
7 of Diamonds	3 of Clubs	2 of Spades	5 of Diamonds
Queen of Hearts	4 of Hearts	6 of Spades	10 of Hearts
6 of Diamonds	10 of Diamonds	King of Hearts	7 of Spades
2 of Hearts	10 of Spades	Queen of Spades	8 of Hearts
King of Spades	6 of Clubs	10 of Clubs	8 of Spades

```
javascript:(
/* Trigonometry - Convert Degrees To Radians */
function()
{
    function getAngleInDegree()
    {
        let angle = parseFloat(prompt("Enter an
angle in degrees:"));

        return angle;
    }

    function convertDegreeToRadian(angle)
    {
        if (!isNaN(angle))
        {
            /* angle in degree converted to radian */
            let radians = angle * (Math.PI / 180);

            return radians;
        }
        else
        {
            alert("You didn't enter an Angle in
numbers");
        }
    }
}
```

```
    }  
}  
}
```

```
let result =  
convertDegreeToRadian(getAngleInDegree());  
  
console.log(result);  
  
alert(result);  
  
}());
```

```
javascript:(
/* Trigonometry - Sine */
function()
{
    function getAngleInDegree()
    {
        let angle = parseFloat(prompt("Enter an
angle in degrees:"));

        return angle;
    }

    function convertDegreeToRadian(angle)
    {
        if (!isNaN(angle))
        {
            /* angle in degree converted to radian */
            let radians = angle * (Math.PI / 180);

            return radians;
        }
        else
        {
            alert("You did not enter an Angle in
numbers");
        }
    }
}
```

```
}

let theRadians =
convertDegreeToRadian(getAngleInDegree());

function sineOfAngle()
{
    let sine = Math.sin(theRadians).toFixed(2);

    return sine;
}

console.log(sineOfAngle());

alert(sineOfAngle());

}());
```

```
javascript:(
/* Trigonometry - Cosine */
function()
{
    function getAngleInDegree()
    {
        let angle = parseFloat(prompt("Enter an
angle in degrees:"));

        return angle;
    }

    function convertDegreeToRadian(angle)
    {
        if (!isNaN(angle))
        {
            /* angle in degree converted to radian */
            let radians = angle * (Math.PI / 180);

            return radians;
        }
        else
        {
            alert("You did not enter an Angle in
numbers");
        }
    }
}
```

```
}
```

```
let theRadians =
convertDegreeToRadian(getAngleInDegree());
```



```
function cosineOfAngle()
{
    let cosine =
Math.cos(theRadians).toFixed(2);

    return cosine;
}

console.log(cosineOfAngle());

alert(cosineOfAngle());
```



```
})();
```

```
javascript:(
/* Trigonometry - Tangent */
function()
{
    function getAngleInDegree()
    {
        let angle = parseFloat(prompt("Enter an
angle in degrees:"));

        return angle;
    }

    function convertDegreeToRadian(angle)
    {
        if (!isNaN(angle))
        {
            /* angle in degree converted to radian */
            let radians = angle * (Math.PI / 180);

            return radians;
        }
        else
        {
            alert("You did not enter an Angle in
numbers");
        }
    }
}
```

```
}

let theRadians =
convertDegreeToRadian(getAngleInDegree());

function tangentOfAngle()
{
    let tangent =
Math.tan(theRadians).toFixed(2);

    return tangent;
}

console.log(tangentOfAngle());

alert(tangentOfAngle());

}());
```

```
javascript:(  
/* Trigonometry - Sine, Cosine, Tangent  
Calculator */  
function()  
{  
    function calculateTrigonometry()  
{  
        let angle = parseFloat(prompt("Enter an  
angle in degrees:"));  
  
        if (!isNaN(angle))  
        {  
            let radians = angle * (Math.PI / 180);  
  
            let sine = Math.sin(radians);  
  
            let cosine = Math.cos(radians);  
  
            let tangent = Math.tan(radians);  
  
            let message = "Angle: " + angle + "  
degrees\n";  
  
            message += "Sine: " + sine.toFixed(4) +  
"\n";  
    }  
}
```

```
    message += "Cosine: " +
cosine.toFixed(4) + "\n";

    message += "Tangent: " +
tangent.toFixed(4);

    alert(message);
}

else
{
    alert("Enter a valid angle in degrees");
}
}

calculateTrigonometry();

}());
```

```
javascript:(  
/* Trigonometry - Circle made using Divs */  
function()  
{  
    function generateCircleOfDivs()  
{  
        /* number of divs to create */  
        let numberOfDivs = 360;  
  
        /* the radius of the circle */  
        let radius = 50;  
  
        /* x pos of the circle's center */  
        let centerX = 100;  
  
        /* y pos of the circle's center */  
        let centerY = 100;  
  
        let container =  
document.createElement("div");  
container.style.width = "200px";  
container.style.height = "200px";  
container.style.position = "fixed";  
container.style.left = 100 + "px";  
container.style.top = 100 + "px";  
container.style.border = "1px solid black";
```

```
document.body.append(container);

for (let x = 0; x < numberOfDivs; x++)
{
    let angle = (x / numberOfDivs) * 2 *
Math.PI;

    let xPos = centerX + radius *
Math.cos(angle);

    let yPos = centerY + radius *
Math.sin(angle);

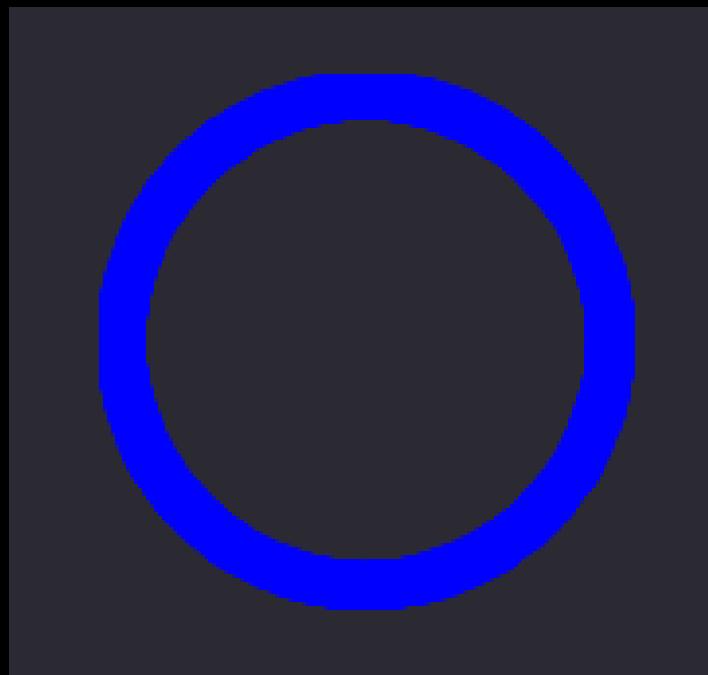
/*----*/

let div =
document.createElement("div");
div.style.width = "10px";
div.style.height = "10px";
div.style.background = "blue";
div.style.borderRadius = "50%";
div.style.position = "absolute";
div.style.left = xPos + "px";
div.style.top = yPos + "px";
container.append(div);
}
```

}

generateCircleOfDivs();

}());



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```
javascript:(
/* Trigonometry - Spinning Circle of Divs */
function()
{
    function generateCircleOfMovingDivs()
    {
        /* number of divs to create */
        let numberOfDivs = 36;

        /* radius of the circle */
        let radius = 50;

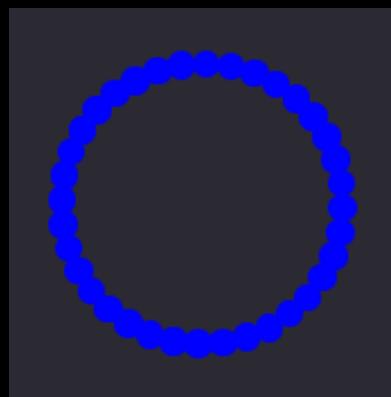
        /* center position */
        let centerX = 100;
        let centerY = 100;

        let container =
document.createElement("div");
        container.style.position = "fixed";
        container.style.left = "20px";
        container.style.top = "20px";
        container.style.width = "200px";
        container.style.height = "200px";
        document.body.append(container);

        for (let x = 0; x < numberOfDivs; x++)
            let div = document.createElement("div");
            div.style.position = "absolute";
            div.style.left = (centerX + radius * Math.cos((x * 2 * Math.PI) / numberOfDivs)).toString() + "px";
            div.style.top = (centerY + radius * Math.sin((x * 2 * Math.PI) / numberOfDivs)).toString() + "px";
            container.appendChild(div);
    }
}
```

```
{  
    let angle = (x / numberOfDivs) * 2 *  
Math.PI;  
  
    let xPos = centerX + radius *  
Math.cos(angle);  
  
    let yPos = centerY + radius *  
Math.sin(angle);  
  
    let div =  
document.createElement("div");  
div.style.position = "absolute";  
div.style.left = xPos + "px";  
div.style.top = yPos + "px";  
div.style.width = "10px";  
div.style.height = "10px";  
div.style.background = "blue";  
div.style.borderRadius = "50%";  
container.append(div);  
  
/* animate the divs */  
setInterval(function()  
{  
    let rotateAngle = (x / numberOfDivs) *  
2 * Math.PI + (new Date().getTime() / 1000);  
})
```

```
xPos = centerX + radius *  
Math.cos(rotateAngle);  
  
yPos = centerY + radius *  
Math.sin(rotateAngle);  
  
div.style.left = xPos + "px";  
  
div.style.top = yPos + "px";  
  
}, 50);  
}  
}  
}  
generateCircleOfMovingDivs();  
}());
```



```
javascript:(  
/* Trigonometry - Pulsating Circle of Divs */  
function()  
{  
    function circleOfDivsPulsating()  
{  
        /* number of divs to create */  
        let numberOfDivs = 60;  
  
        /* radius of the circle */  
        let radius = 50;  
  
        /* center position */  
        let centerX = 100;  
        let centerY = 100;  
  
        /* container for the circle */  
        let container =  
document.createElement("div");  
        container.style.position = "fixed";  
        container.style.left = "100px";  
        container.style.top = "100px";  
        container.style.width = "200px";  
        container.style.height = "200px";  
        container.style.margin = "0 auto";  
        container.style.overflow = "hidden";
```

```
document.body.append(container);

/* create the divs */
for (let x = 0; x < numberOfDivs; x++)
{
    let angle = (x / numberOfDivs) * 2 *
Math.PI;

    let xPos = centerX + radius *
Math.cos(angle);

    let yPos = centerY + radius *
Math.sin(angle);

    let div =
document.createElement("div");
    div.style.width = "10px";
    div.style.height = "10px";
    div.style.background = "blue";
    div.style.borderRadius = "50%";
    div.style.position = "absolute";
    div.style.left = xPos + "px";
    div.style.top = yPos + "px";
    container.append(div);
}
```

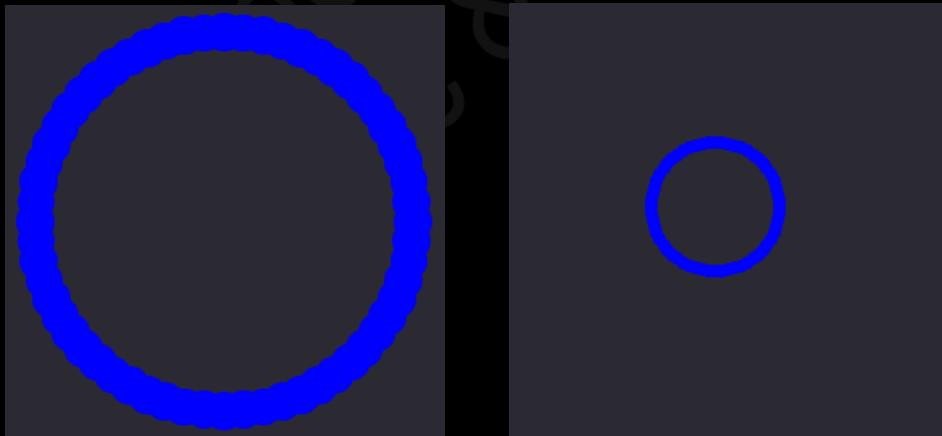
```
/* animate the pulsating effect */
let scale = 1;
let growing = true;

function animate()
{
    if (growing)
    {
        scale += 0.01;

        if (scale >= 2)
        {
            growing = false;
        }
    }
    else
    {
        scale -= 0.01;

        if (scale <= 0.5)
        {
            growing = true;
        }
    }
}
```

```
container.style.transform =  
'scale('+scale+')';  
}  
  
setInterval(function()  
{  
    animate();  
}, 10);  
}  
  
circleOfDivsPulsating();  
}());
```



```
javascript:(
/* Trigonometry - Draw Sine and Cosine */
function()
{
    function graphSineAndCosine()
    {
        let canvas =
document.createElement("canvas");
        canvas.style.position = "absolute";
        canvas.style.left = 100 + "px";
        canvas.style.top = 50 + "px";
        canvas.width = 700;
        canvas.height = 500;

        /*----*/
        let context = canvas.getContext("2d");

        /* clear the canvas */
        context.clearRect(0, 0, canvas.width,
        canvas.height);

        /* draw x and y axes */
        context.beginPath();
        context.moveTo(0, canvas.height / 2);
        context.lineTo(canvas.width,
```

```
canvas.height / 2);
context.moveTo(canvas.width / 2, 0);
context.lineTo(canvas.width / 2,
canvas.height);
context.strokeStyle = "black";
context.stroke();
context.closePath();

/* draw sine function */
context.beginPath();
context.moveTo(0, canvas.height / 2);

for (let x = 0; x < canvas.width; x++)
{
    let radians = (x - canvas.width / 2) *
(Math.PI / 180);

    let y = Math.sin(radians) *
(canvas.height / 4) + (canvas.height / 2);

    context.lineTo(x, y);
}

context.strokeStyle = "blue";
context.stroke();
context.closePath();
```

```
/* draw cosine function */
context.beginPath();
context.moveTo(0, canvas.height / 2);

for (let x = 0; x < canvas.width; x++)
{
    let radians = (x - canvas.width / 2) *
(Math.PI / 180);

    let y = Math.cos(radians) *
(canvas.height / 4) + (canvas.height / 2);

    context.lineTo(x, y);
}

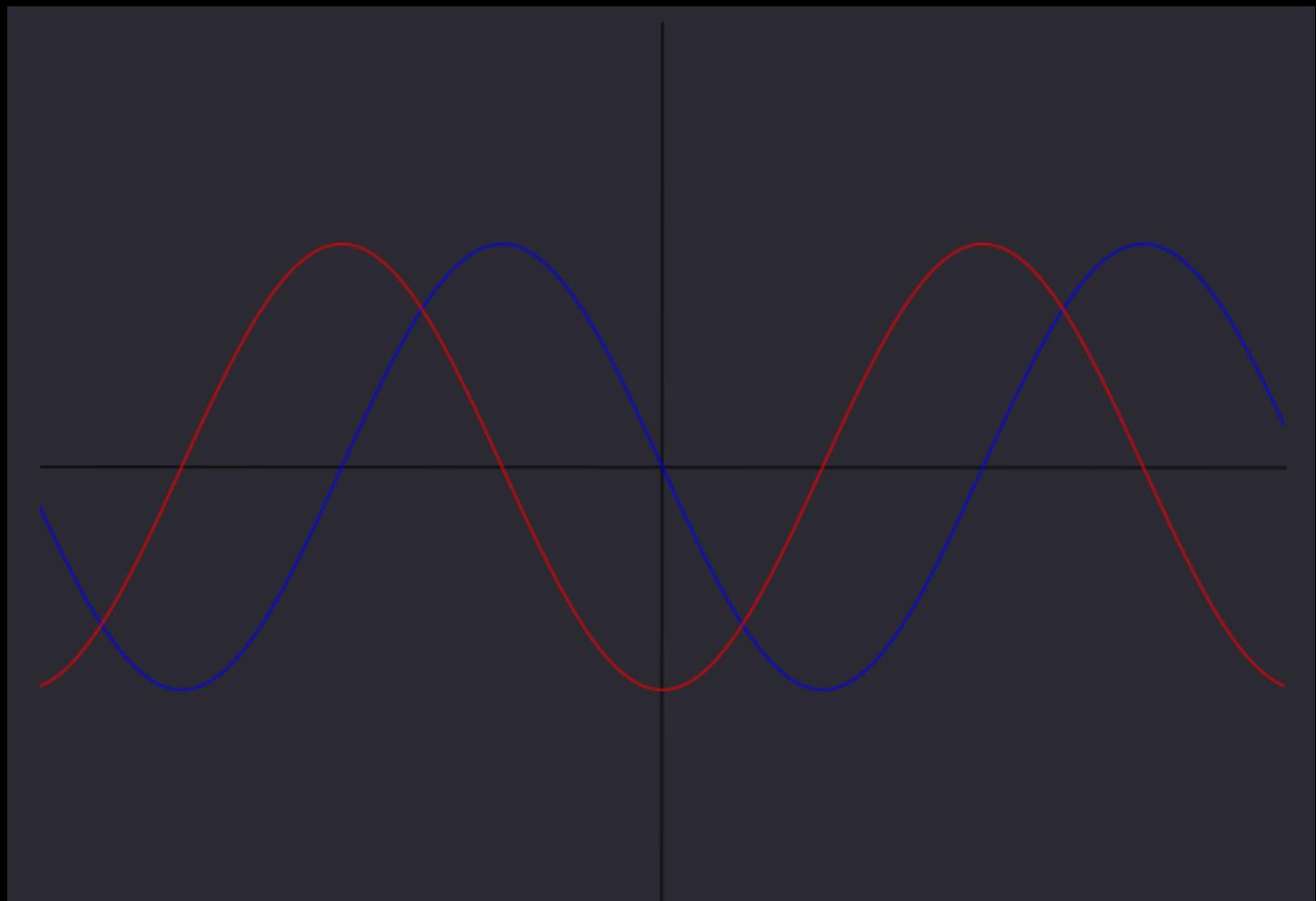
context.strokeStyle = "red";
context.stroke();
context.closePath();

document.body.append(canvas);
}

graphSineAndCosine();
```

}());

```
/*
creates a dynamic trigonometric graph using
canvas to draw the sine and cosine functions
*/
```



```
javascript:(
/* Trigonometry - Sine Wave Motion */
function()
{
    function generateSineWaveWithMotion()
    {
        let amplitude = 50;
        let frequency = 0.1;

        let xOffset = 0;
        let yOffset = 100;

        let canvasWidth = window.innerWidth;
        let canvasHeight = 200;

        /*----*/
        let canvas =
document.createElement('canvas');
        canvas.style.position = 'fixed';
        canvas.style.left = '0';
        canvas.style.top = '0';
        canvas.width = canvasWidth;
        canvas.height = canvasHeight;
        canvas.style.zIndex = '9999';
        canvas.style.pointerEvents = 'none';
    }
}
```

```
document.body.append(canvas);

/*----*/

let context = canvas.getContext('2d');

/*----*/

function drawSineWave()
{
    context.clearRect(0, 0, canvas.width,
    canvas.height);

    context.beginPath();

    for (let x = 0; x < canvasWidth; x += 1)
    {
        let y = amplitude * Math.sin(frequency
        * x + xOffset) + yOffset;

        context.lineTo(x, y);
    }

    context.strokeStyle = 'blue';
    context.lineWidth = 4;
    context.stroke();
```

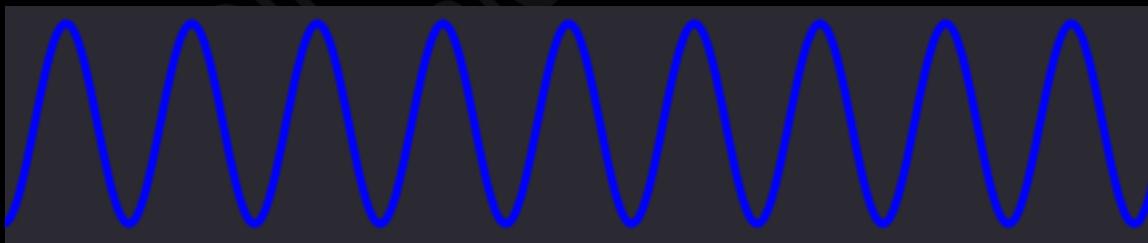
```
}

function animate()
{
    xOffset += 1;
    drawSineWave();
    requestAnimationFrame(animate);
}

animate();
}

generateSineWaveWithMotion();

}());
```



```
javascript:(
/* Trigonometry - Cosine Wave Motion */
function()
{
    function generateCosineWaveWithMotion()
    {
        let amplitude = 50;
        let frequency = 0.05;

        let xOffset = 0;
        let yOffset = 100;

        let canvasWidth = window.innerWidth;
        let canvasHeight = 200;

        /*----*/
        let canvas =
document.createElement('canvas');
        canvas.style.position = 'fixed';
        canvas.style.left = '0';
        canvas.style.top = '0';
        canvas.width = canvasWidth;
        canvas.height = canvasHeight;
        canvas.style.zIndex = '10000';
        canvas.style.pointerEvents = 'none';
    }
}
```

```
document.body.append(canvas);

/*----*/

let context = canvas.getContext('2d');

/*----*/

function drawCosineWaves()
{
    context.clearRect(0, 0, canvas.width,
canvas.height);

    /* draw the cosine wave in red */
    context.beginPath();
    context.strokeStyle = 'red';

    for (let x = 0; x < canvasWidth; x += 1)
    {
        let y = amplitude *
Math.cos(frequency * x + xOffset) + yOffset;
        context.lineTo(x, y);
    }
    context.stroke();
}
```

```
/*----*/  
  
function animate()  
{  
    xOffset += 0.1;  
    drawCosineWaves();  
    requestAnimationFrame(animate);  
}  
  
animate();  
  
}  
  
generateCosineWaveWithMotion();  
  
}());
```



```
javascript:(
/* Trigonometry - Tangent Wave Motion */
function()
{
    function generateTangentWaveWithMotion()
    {
        let amplitude = 50;
        let frequency = 0.05;

        let xOffset = 0;
        let yOffset = 100;

        let canvasWidth = window.innerWidth;
        let canvasHeight = 200;

        /*----*/
        let canvas =
document.createElement('canvas');
        canvas.style.position = 'fixed';
        canvas.style.left = '0';
        canvas.style.top = '0';
        canvas.width = canvasWidth;
        canvas.height = canvasHeight;
        canvas.style.zIndex = '10000';
        canvas.style.pointerEvents = 'none';
    }
}
```

```
document.body.append(canvas);

/*----*/

let context = canvas.getContext('2d');

/*----*/

function drawTangentWave()
{
    context.clearRect(0, 0, canvas.width,
    canvas.height);
    context.beginPath();

    for (let x = 0; x < canvasWidth; x += 1)
    {
        let y = amplitude * Math.tan(frequency
        * x + xOffset) + yOffset;
        context.lineTo(x, y);
    }

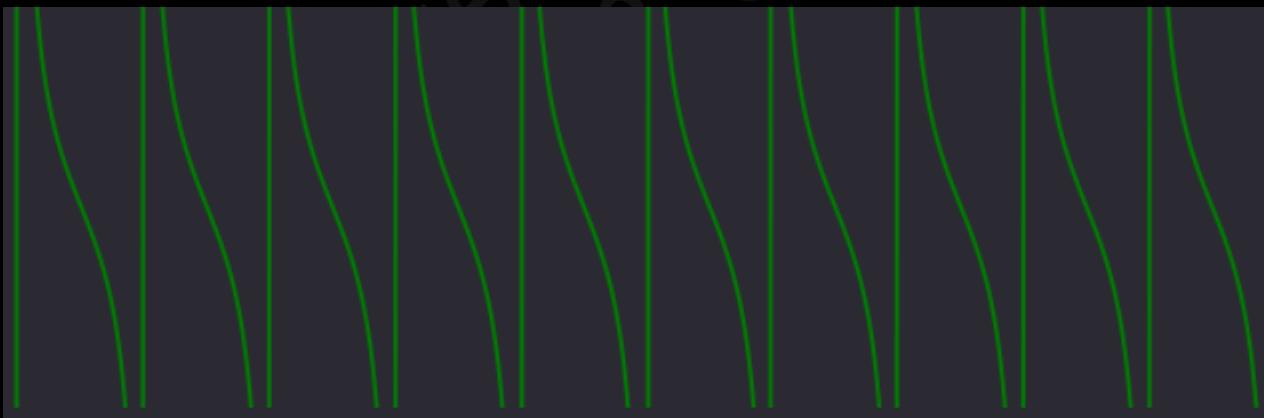
    context.strokeStyle = 'green';
    context.lineWidth = 2;
    context.stroke();
}
```

```
function animate()
{
    xOffset += 0.1;
    drawTangentWave();
    requestAnimationFrame(animate);
}

animate();
}

generateTangentWaveWithMotion();

}());
```



```
javascript:(
/* Trigonometry - Sine and Cosine Wave Motion */
function()
{
    function
generateSineAndCosineWavesWithMotion()
{
    let amplitude = 50;
    let frequency = 0.05;

    let xOffset = 0;
    let yOffset = 100;

    let canvasWidth = window.innerWidth;
    let canvasHeight = 200;

    /*----*/
    let canvas =
document.createElement('canvas');
    canvas.style.position = 'fixed';
    canvas.style.left = '0';
    canvas.style.top = '0';
    canvas.width = canvasWidth;
    canvas.height = canvasHeight;
```

```
canvas.style.zIndex = '10000';
canvas.style.pointerEvents = 'none';
document.body.append(canvas);

/*----*/
let context = canvas.getContext('2d');

/*----*/

function drawSineCosineWaves()
{
    context.clearRect(0, 0, canvas.width,
    canvas.height);

    /* draw the sine wave in blue */
    context.beginPath();
    context.strokeStyle = 'blue';
    context.lineWidth = 2;

    for (let x = 0; x < canvasWidth; x += 1)
    {
        let y = amplitude * Math.sin(frequency
        * x + xOffset) + yOffset;
        context.lineTo(x, y);
    }
}
```

```
context.stroke();

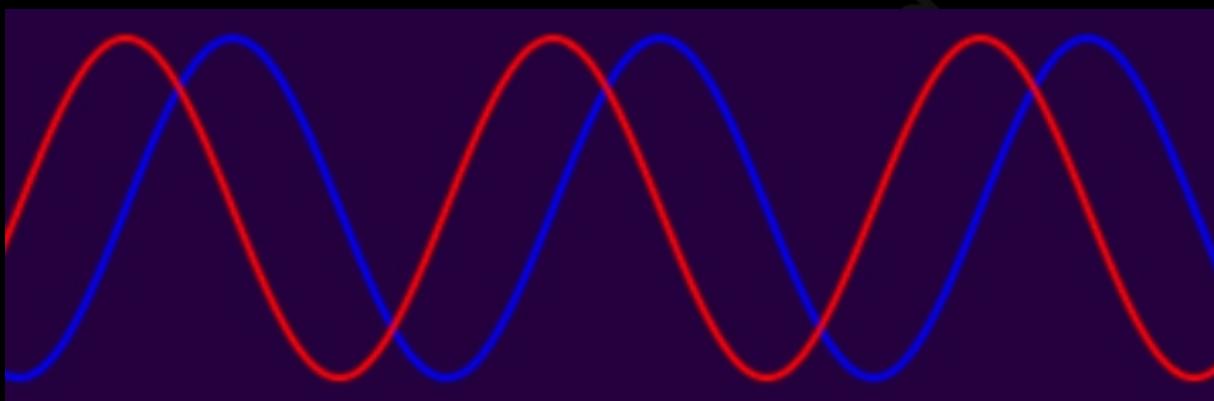
/* draw the cosine wave in red */
context.beginPath();
context.strokeStyle = 'red';

for (let x = 0; x < canvasWidth; x += 1)
{
    let y = amplitude *
Math.cos(frequency * x + xOffset) + yOffset;
    context.lineTo(x, y);
}

context.stroke();
}

/*----*/
function animate()
{
    xOffset += 0.1;
    drawSineCosineWaves();
    requestAnimationFrame(animate);
}
```

```
    animate();  
}  
  
generateSineAndCosineWavesWithMotion();  
  
}());
```



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```
javascript:(
/* Trigonometry - Draw a Circle - Draw a 45
Degree Line - Create a Label */
function()
{
    function drawCircleWith45DegreeLine()
    {
        let canvasWidth = 400;
        let canvasHeight = 400;

        let canvas =
document.createElement('canvas');
        canvas.style.position = 'fixed';
        canvas.style.left = '0';
        canvas.style.top = '0';
        canvas.width = canvasWidth;
        canvas.height = canvasHeight;
        canvas.style.zIndex = '10000';
        canvas.style.pointerEvents = 'none';
        document.body.append(canvas);

        /*----*/
        let context = canvas.getContext('2d');

        /*----*/
    }
}
```

```
function drawCircle()
{
    let centerX = canvasWidth / 2;
    let centerY = canvasHeight / 2;

    let radius = 150;

    context.strokeStyle = 'aqua';

    context.lineWidth = 4;

    /* draw the circle */
    context.beginPath();

    context.arc(centerX, centerY, radius, 0,
2 * Math.PI);

    context.stroke();

    /*----*/
    /* draw the radius line at an angle */
    let angleInDegrees = 45;

    let angleInRadians = (angleInDegrees *
Math.PI) / 180;
```

```
let endX = centerX + radius *  
Math.cos(angleInRadians);
```

```
let endY = centerY + radius *  
Math.sin(angleInRadians);
```

```
context.strokeStyle = 'white';  
context.lineWidth = 4;  
context.beginPath();  
context.moveTo(centerX, centerY);  
context.lineTo(endX, endY);  
context.stroke();
```

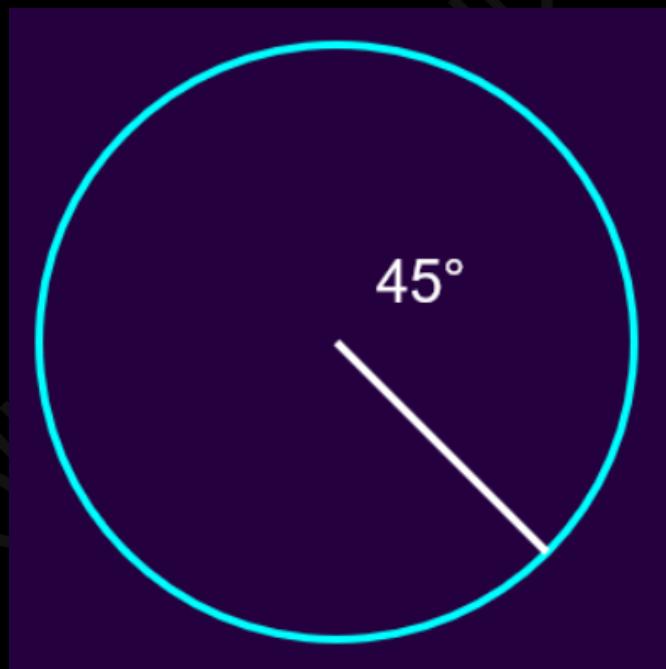
```
/*----*/
```

```
/* label the angle in degrees */  
context.font = '30px arial';  
context.fillStyle = 'white';  
context.fillText(angleInDegrees + '°',  
centerX + 20, centerY - 20);  
}  
drawCircle();  
}
```

```
drawCircleWith45DegreeLine();
```

```
});
```

```
/*  
creates a circle with a 45 degree line and a  
label  
*/
```



```
javascript:(  
/* Trigonometry - Angle between two objects  
Constant Updates */  
function()  
{  
let object1 = document.createElement("div");  
object1.style.position = "absolute";  
object1.style.top = "50px";  
object1.style.left = "50px";  
object1.style.width = "20px";  
object1.style.height = "20px";  
object1.style.background = "red";  
document.body.append(object1);  
  
let object2 = document.createElement("div");  
object2.style.position = "absolute";  
object2.style.top = "100px";  
object2.style.left = "200px";  
object2.style.width = "20px";  
object2.style.height = "20px";  
object2.style.background = "blue";  
document.body.append(object2);  
  
function calculateAngle()  
{
```

```
let deltaX = object2.offsetLeft -  
object1.offsetLeft;  
  
let deltaY = object2.offsetTop -  
object1.offsetTop;  
  
let angle = Math.atan2(deltaY, deltaX) *  
(180 / Math.PI);  
  
return angle;  
}  
  
function updateAngleDisplay()  
{  
    let angle = calculateAngle();  
  
    console.log("Angle between objects: " +  
angle.toFixed(2) + " degrees");  
}  
  
function moveObjectDown()  
{  
    let top = parseInt(object2.style.top) || 0;  
  
    object2.style.top = (top + 1) + "px";
```

```
/* move the blue object down */  
updateAngleDisplay();  
}  
  
function animate()  
{  
    moveObjectDown();  
    requestAnimationFrame(animate);  
}  
  
animate();  
  
/* start moving the blue object down and  
updating the angle */  
moveObjectDown();  
}());
```



Inspector



Console



Debugger



Filter Output

Angle between objects: 47.20 degrees

Angle between objects: 47.38 degrees

Angle between objects: 47.55 degrees

Angle between objects: 47.73 degrees

Angle between objects: 47.90 degrees

Angle between objects: 48.07 degrees

```
javascript:(
/* Make Roads like in Cities Skylines */
function()
{
    function makeRoad()
    {
        let road = document.createElement("div");
        road.style.position = "absolute";
        road.style.backgroundColor = "gray";
        road.style.height = "20px";
        road.style.width = "5px";
        road.style.pointerEvents = "none";
        document.body.append(road);

        let isDrawing = false;

        document.addEventListener("mousedown",
        function(e)
        {
            isDrawing = true;
            road.style.left = e.pageX + "px";
            road.style.top = e.pageY + "px";
        });

        document.addEventListener("mouseup",
        function()

```

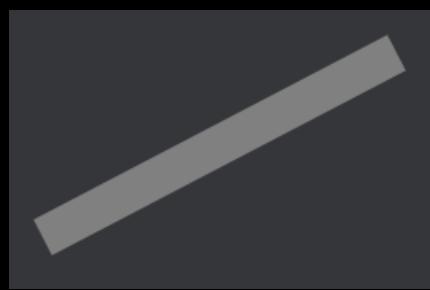
```
{  
    isDrawing = false;  
});  
  
document.addEventListener("mousemove",  
function(e)  
{  
    if (isDrawing)  
    {  
        let currentX = e.pageX;  
        let currentY = e.pageY;  
  
        let deltaX = currentX -  
parseInt(road.style.left);  
  
        let deltaY = currentY -  
parseInt(road.style.top);  
  
        let length = Math.sqrt(deltaX * deltaX  
+ deltaY * deltaY);  
  
        let angle = Math.atan2(deltaY, deltaX);  
  
        road.style.width = length + "px";  
    }  
});
```

```
    road.style.transform = "rotate(" +  
angle + "rad);  
}  
});  
}  
  
makeRoad();  
  
}());
```

/*
After we have activated this bookmarklet, we hold left click and drag our mouse to make the road, and then let go of the left click to place the road at that angle.

Now at anytime that we want we can left click to place that angled road piece anywhere on the screen.

*/



```
javascript:(
/* Password Generator - Specify How Many
Characters without Input Validation */
function()
{
    function makePassword()
    {
        function
generatePassword(whichAmount)
        {
            const characters =
"abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789!@#$%^&*()_-+=<>?/{[]}";
            let password = "";
            for (let x = 0; x < whichAmount; x++)
            {
                const randomIndex =
Math.floor(Math.random() * characters.length);
                password +=
characters.charAt(randomIndex);
            }
        }
    }
}
```

```
    return password;
}

const passwordLength = prompt("Enter
how many characters");

if (passwordLength !== null)
{
    const parsedLength =
parseInt(passwordLength);

    const generatedPassword =
generatePassword(parsedLength);

    console.log("Password is " +
generatedPassword);

    alert("Password is " +
generatedPassword);
}

makePassword();

}());
```

```
javascript:(
/* Password Generator - Specify How Many
Characters with Input Validation */
function()
{
    function makePassword()
    {
        function
generatePassword(whichAmount)
        {
            const characters =
"abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789!@#$%^&*()_-+=<>?/{[]}";
            let password = "";
            for (let x = 0; x < whichAmount; x++)
            {
                const randomIndex =
Math.floor(Math.random() * characters.length);
                password +=
characters.charAt(randomIndex);
            }
        }
    }
}
```

```
    return password;
}

const passwordLength = prompt("Enter
how many characters");

if (passwordLength !== null)
{
    const parsedLength =
parseInt(passwordLength);

    if (!isNaN(parsedLength) &&
parsedLength > 0)
    {
        const generatedPassword =
generatePassword(parsedLength);

        console.log("Password is " +
generatedPassword);

        alert("Password is " +
generatedPassword);
    }
    else
    {

```

```
    alert("You didn't enter how many  
characters you want the password to be.");  
}  
}  
}  
  
makePassword();  
}());
```

```
javascript:(  
/* Robot AI - Array of Objects - Responds once  
to EXACT word(s) */  
function()  
{  
    const responses =  
    [  
        {  
            keyword: "hi",  
            response: "Howdy! Good to see you  
bud"  
        },  
  
        {  
            keyword: "how is the weather today",  
            response: "Very Nice!"  
        },  
  
        {  
            keyword: "how are you",  
            response: "I'm doing good, you?"  
        },  
  
        {  
            keyword: "bye",  
            response: "Bye. Talk to you soon"  
        }  
    ]  
}
```

```
    }
};

function createRobot()
{
  const userInput = prompt("Ask me a
question:");

  if (userInput)
  {
    const responseObj =
responses.find(function (obj)
    {
      return obj.keyword.toLowerCase()
==== userInput.toLowerCase();
    });
  }

  if (responseObj)
  {
    alert(responseObj.response);
  }
  else
  {
    alert("Rephrase the question");
  }
}
```

```
    }  
  
    createRobot();  
  
});
```

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```
javascript:(  
/* Robot AI - Array of Objects - Responds to  
EXACT word(s) Continuously */  
function()  
{  
    const responses =  
    [  
        {  
            keyword: "hi",  
            response: "Howdy! Good to see you,  
bud"  
        },  
  
        {  
            keyword: "how is the weather",  
            response: "Very nice!"  
        },  
  
        {  
            keyword: "how are you",  
            response: "I'm doing good, you?"  
        },  
  
        {  
            keyword: "bye",  
            response: "Bye. Talk to you soon"  
        }  
    ]  
}
```

```
    }
};

function createRobot()
{
    while (true)
    {
        const userInput = prompt("Ask me a
question:");

        if (!userInput)
        {
            /* exit the loop if the user cancels or
enters nothing */
            break;
        }

        const responseObj =
responses.find(function (obj)
{
    return obj.keyword.toLowerCase()
 $\equiv\equiv$  userInput.toLowerCase();
});

        if (responseObj)
{
```

```
    alert(responseObj.response);
}
else
{
    alert("Rephrase the question");
}
}

createRobot();

}());
```

```
javascript:(  
/* Robot AI - Array Of Objects - Responds to  
word(s) continuously with language  
comprehension (keyword-based) */  
function()  
{  
    const responses =  
    [  
        {  
            keyword: "hi",  
            response: "Howdy! Good to see you,  
            bud"  
        },  
        {  
            keyword: "weather",  
            response: "Very nice!"  
        },  
        {  
            keyword: "how are you",  
            response: "I'm doing good, you?"  
        },  
        {  
            keyword: "bye",  
            response: "Goodbye!"  
        }  
    ]  
    return function(...args){  
        const [word] = args;  
        if(responses.length > 0){  
            const matchingResponses = responses.filter(response =>  
                response.keyword === word);  
            if(matchingResponses.length > 0){  
                const response = matchingResponses[0];  
                return response.response;  
            }  
        }  
        return "I don't understand that word."  
    };  
}());
```

```
        response: "Bye. Talk to you soon"
    }
];

function createRobot()
{
    while (true)
    {
        const userInput = prompt("Ask me a
question:");

        if (!userInput)
        {
            /* exit the loop if the user cancels or
enters nothing */
            break;
        }

        /* check for keywords in the user's input */
        const responseObj =
responses.find(function(obj)
{
    return
userInput.toLowerCase().includes(obj.keyword
);
});
```

```
if (responseObj)
{
    alert(responseObj.response);

    if (responseObj.keyword === "bye")
    {
        /* exit the loop on "bye" */
        break;
    }
}
else
{
    alert("Rephrase the question");
}
}

createRobot();

}());
```

```
javascript:(  
/* Robot AI - Array Of Objects - Responds to  
word(s) continuously with Language  
Comprehension (keyword-based) and  
Contextual Responses */  
function()  
{  
    function createRobot()  
    {  
        const responses =  
        [  
            {  
                keyword: "hi",  
                response: "Howdy bud"  
            },  
            {  
                keyword: "weather",  
                response: "Very nice!"  
            },  
            {  
                keyword: "how are you",  
                response: "I'm doing good, you?"  
            },  
            {  
                keyword: "bye",  
                response: "Bye. Talk to you soon"  
            }  
        ]  
        return responses;  
    }  
}  
);
```

```
        }
    ];
}

/* initialize context variable */
let context = null;

while (true)
{
    const userInput = prompt("Ask me a
question:");

    if (!userInput)
    {
        /* exit the loop if the user cancels or
enters nothing */
        break;
    }

    /* check for keywords in the user's input
*/
    const responseObj =
responses.find(function(obj)
{
    return
userInput.toLowerCase().includes(obj.keyword
);
}
```

```
});  
  
if (responseObj)  
{  
    /* check for context and provide  
    contextual response */  
    if (context === responseObj.keyword)  
    {  
        if (context === "weather")  
        {  
            alert("Weather is still nice.");  
        }  
        else if (context === "how are you")  
        {  
            alert("Always Excellent");  
        }  
        else if (context === "hi")  
        {  
            alert("Hi again.");  
        }  
    }  
    else  
    {  
        alert(responseObj.response);  
    }  
}
```

```
if (responseObj.keyword === "bye")
{
    /* exit the loop on "bye" */
    break;
}

/* update context based on user input */
context = responseObj.keyword;
}

else
{
    alert("Rephrase the question");
}

}

createRobot();

}());
```

```
javascript:(  
/* Robot AI - Array Of Objects - Language  
Comprehension (keyword-based), Contextual  
Responses and Random Responses for when  
no keywords are found */  
function()  
{  
    const responses =  
    [  
        {  
            keyword: "hi",  
            response: "Howdy bud"  
        },  
        {  
            keyword: "weather",  
            response: "Very nice!"  
        },  
        {  
            keyword: "how are you",  
            response: "I'm doing good, you?"  
        },  
        {  
            keyword: "bye",  
            response: "Bye. Talk to you soon"  
        }  
    ];
```

```
const randomResponses =  
[  
    "That's interesting!",  
    "Would you tell me more?",  
    "Hmm, tell me more about that.",  
    "Would you elaborate?",  
    "Interesting, please go on.",  
    "Fascinating! Tell me more.",  
];  
  
function createRobot()  
{  
    /* initialize context variable */  
    let context = null;  
  
    function getRandomResponse()  
    {  
        const randomIndex =  
Math.floor(Math.random() *  
randomResponses.length);  
  
        return  
randomResponses[randomIndex];  
    }  
}
```

```
while (true)
{
    const userInput = prompt("Ask me a
question:");

    if (!userInput)
    {
        /* exit the loop if the user cancels or
enters nothing */
        break;
    }

    /* check for keywords in the user's input */
    const responseObj =
responses.find(function(obj)
{
    return
userInput.toLowerCase().includes(obj.keyword
);
});

    if (responseObj)
    {
        /* check for context and provide
contextual response */
        if (context === responseObj.keyword)
```

```
{  
    if (context === "weather")  
    {  
        alert("Weather is still nice.");  
    }  
    else if (context === "how are you")  
    {  
        alert("Always Excellent");  
    }  
    else if (context === "hi")  
    {  
        alert("Hi again.");  
    }  
}  
else  
{  
    alert(responseObj.response);  
}  
  
if (responseObj.keyword === "bye")  
{  
    /* exit the loop on "bye" */  
    break;  
}  
  
/* update context based on user input */
```

```
    context = responseObj.keyword;
}
else
{
    /* generate a random response for
unrecognized input */
    alert(getRandomResponse());
}
}

createRobot();

}());
```

```
javascript:(  
/* Robot AI - Array Of Objects - Language  
Comprehension (keyword-based), Contextual  
Responses, Random Responses and  
Calculations */  
function()  
{  
    const responses =  
    [  
        {  
            keyword: "hi",  
            response: "Howdy bud"  
        },  
        {  
            keyword: "weather",  
            response: "It's a beautiful day outside!"  
        },  
        {  
            keyword: "how are you",  
            response: "I'm doing good, you?"  
        },  
        {  
            keyword: "bye",  
            response: "Bye. Talk to you soon."  
        },  
        {  
    ]  
}
```

```
    keyword: "interests",
    response: "Computer Science is fun."
}
];

```



```
const randomResponses =
[
  "That's interesting!",
  "Would you tell me more?",
  "Hmm, tell me more about that.",
  "Would you elaborate?",
  "Interesting, please go on.",
  "Fascinating! Tell me more.",
];

```

```
function createRobot()
{

```

```
  /* initialize context variable */
  let context = null;

```

```
function getRandomResponse()
{

```

```
  const randomIndex =
Math.floor(Math.random() *
randomResponses.length);

```

```
return
randomResponses[randomIndex];
}

while (true)
{
    const userInput = prompt("Ask me a
question:");

    if (!userInput)
    {
        /* exit the loop if the user cancels or
enters nothing */
        break;
    }

    /* check for keywords in the user's input */
    const responseObj =
responses.find(function (obj)
{
    return
userInput.toLowerCase().includes(obj.keyword
);
});

    if (responseObj)
```

```
{  
    /* check for context and provide  
contextual response */  
    if (context === responseObj.keyword)  
    {  
        if (context === "weather")  
        {  
            alert("Weather is still nice.");  
        }  
        else if (context === "how are you")  
        {  
            alert("Always excellent.");  
        }  
        else if (context === "hi")  
        {  
            alert("Hi again.");  
        }  
    }  
    else  
    {  
        alert(responseObj.response);  
    }  
  
    if (responseObj.keyword === "bye")  
    {  
        /* exit the loop on "bye" */  
    }  
}
```

```
        break;  
    }  
  
    /*----*/  
  
    /* update context based on user input */  
    context = responseObj.keyword;  
}  
  
else  
{  
    /* check if the user input is a  
calculation */  
    const result = calculate(userInput);  
  
    if (result !== null)  
{  
        alert("The result is: " + result);  
    }  
    else  
{  
        /* generate a random response for  
unrecognized input */  
        alert(getRandomResponse());  
    }  
}
```

```
    }
}

function calculate(input)
{
    try
    {
        return eval(input);
    }
    catch(error)
    {
        /* invalid calculation */
        return null;
    }
}
createRobot();

}());
```

/*
**If the user opens a new tab in their browser
and activates this script and then attempts to
use the new calculation feature, then the
browser security will not allow it.**

Content-Security-Policy: The page's settings blocked the loading of a resource at eval ("script-src").

To fix this issue and be able to use the calculation feature, we must first go to any website, such as google, and then activate our script.

When we are on any website, we are allowed to use the calculation eval feature.

Type in 2+2, then press OK.

***/**

```
javascript:(  
/* Robot AI - Random Responses every time to  
keywords found. Other random response when  
no keywords are found - and Calculations */  
function()  
{  
    /* if keyword is found, use these responses  
*/  
    const responses =  
    [  
        {  
            keyword: "hi",  
            responses: ["Howdy", "Hi there", "Hi"]  
        },  
        {  
            keyword: "weather",  
            responses: ["It's a beautiful day.", "The  
weather is very nice.", "It's sunny and warm."]   
        },  
        {  
            keyword: "how are you",  
            responses: ["I'm doing good, you?",  
"Having fun and you?", "I'm good, how about  
you?"]  
        },  
        {  
    
```

```
    keyword: "bye",
    responses: ["Bye. Talk to you soon.",
"Goodbye!", "Have fun."]
},
{
keyword: "interests",
responses: ["Computer Science is fun.",
"Programming is lots of fun.", "I like
programming a lot."]
}
];
/* if no keywords are found, use these
responses */
const randomResponses =
[
  "That's interesting!",
  "Would you tell me more?",
  "Hmm, tell me more about that.",
  "Would you elaborate?",
  "Interesting, please go on.",
  "Fascinating! Tell me more."
];

```

```
function createRobot()
{
```

```
let context = null;

while (true)
{
    const userInput = prompt("Ask me a
question:");

    if (!userInput)
    {
        break;
    }

    let responseObj =
responses.find(function(obj)
{
    return
userInput.toLowerCase().includes(obj.keyword
);
});

/* if keyword is found */
if (responseObj)
{
    const randomIndex =
Math.floor(Math.random() *
responseObj.responses.length);
```

```
alert(responseObj.responses[randomIndex]);
```

```
if (responseObj.keyword === "bye")
{
    break;
}

context = responseObj.keyword;
}
else
{
    const result = calculate(userInput);

    if (result !== null)
    {
        alert("The result is: " + result);
    }
    /* if no keyword is found */
    else
    {
        const randomIndex =
Math.floor(Math.random() *
randomResponses.length);

        alert(randomResponses[randomIndex]);
    }
}
```

```
        }
    }
}
}

function calculate(input)
{
    try
    {
        return eval(input);
    }
    catch (error)
    {
        return null;
    }
}
createRobot();

}());
```

```
javascript:(  
/* Robot AI - Random Responses every time to  
keywords and phrases and variations of  
keywords and phrases found. Other random  
response when no keywords are found - and  
Calculations */  
function()  
{  
    /* if keyword is found, use these responses  
*/  
    let responses =  
    [  
        {  
            keywords: ["hi", "howdy", "hey"],  
            responses: ["Howdy", "Hi there", "Hi"]  
        },  
        {  
            keywords: ["weather", "forecast",  
"sunny", "cloudy"],  
            responses: ["It's a beautiful day.", "The  
weather is very nice.", "It's sunny and warm."] }  
        },  
        {  
            keywords: ["how are you", "what's up",  
"what are you up to?"] }  
    ]  
}  
)
```

```
    responses: ["I'm doing good, you?",  
"Having fun and you?", "I'm good, how about  
you?"]
```

```
},
```

```
{
```

```
    keywords: ["bye", "goodbye", "take  
care"],
```

```
    responses: ["Bye. Talk to you soon.",  
"Goodbye!", "Have fun."]
```

```
},
```

```
{
```

```
    keywords: ["interests", "career"],
```

```
    responses: ["Computer Science is  
fun.", "Programming is lots of fun.", "I like  
programming a lot."]
}
```

```
}
```

```
];
```

```
/* if no keywords are found, use these  
responses */
```

```
let randomResponses =
```

```
[
```

```
    "That's interesting!",
```

```
    "Would you tell me more?",
```

```
    "Hmm, tell me more about that.",
```

```
    "Would you elaborate?",
```

"Interesting, please go on.",
"Fascinating! Tell me more.",
];

```
function createRobot()
{
    let context = null;

    while (true)
    {
        let userInput = prompt("Ask me a
question:");

        if (!userInput)
        {
            break;
        }

        let responseObj =
responses.find(function(obj)
{
    return
obj.keywords.some(function(keyword) {
    return
userInput.toLowerCase().indexOf(keyword) !==
-1;
});
```

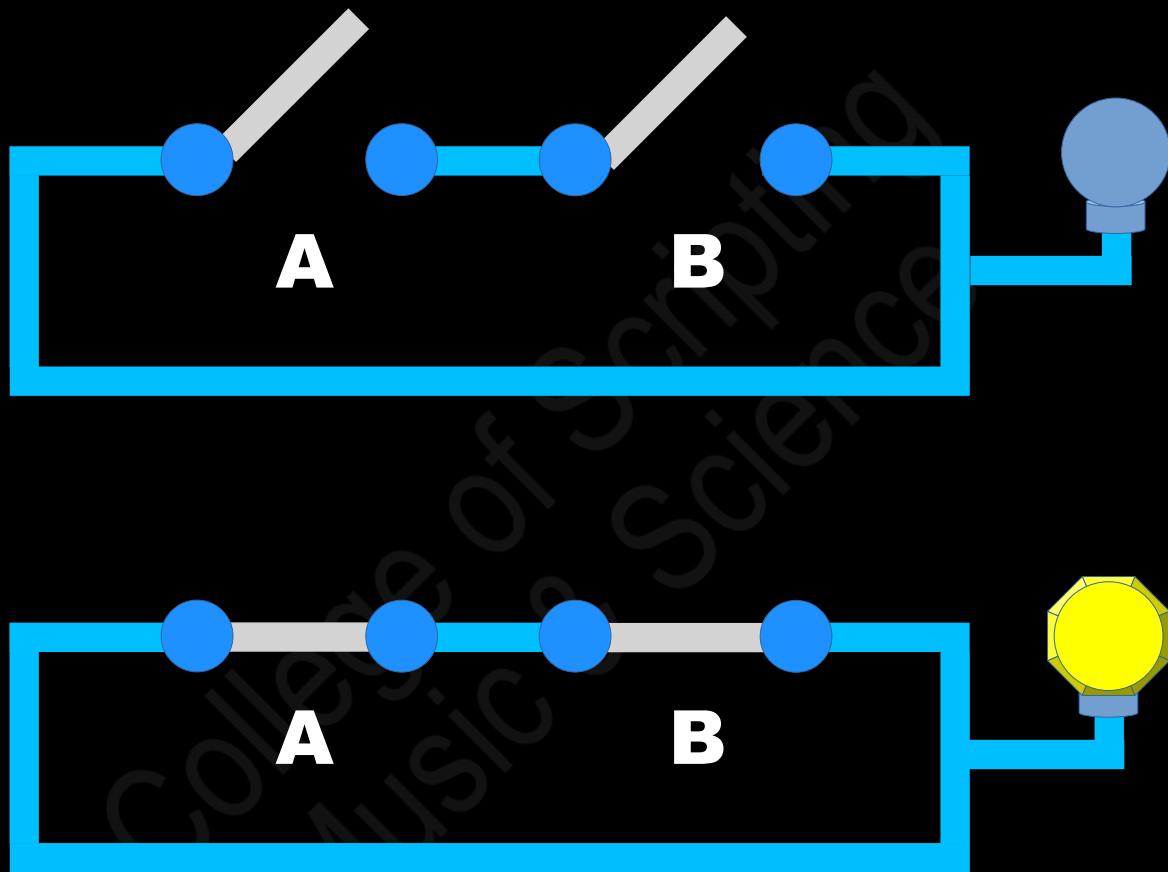
```
});  
});  
  
/* if keyword is found */  
if (responseObj)  
{  
    let randomIndex =  
Math.floor(Math.random() *  
responseObj.responses.length);  
  
alert(responseObj.responses[randomIndex]);  
  
    if  
(responseObj.keywords.indexOf("bye") !== -1)  
    {  
        break;  
    }  
  
    context = responseObj.keywords;  
}  
else  
{  
    let result = calculate(userInput);  
  
    if (result !== null)
```

```
{  
    alert("The result is: " + result);  
}  
else  
{  
    let randomIndex =  
Math.floor(Math.random() *  
randomResponses.length);  
  
alert(randomResponses[randomIndex]);  
}  
}  
}  
}  
}  
}  
  
function calculate(input)  
{  
    try  
    {  
        return eval(input);  
    }  
    catch (error)  
    {  
        return null;  
    }  
}
```

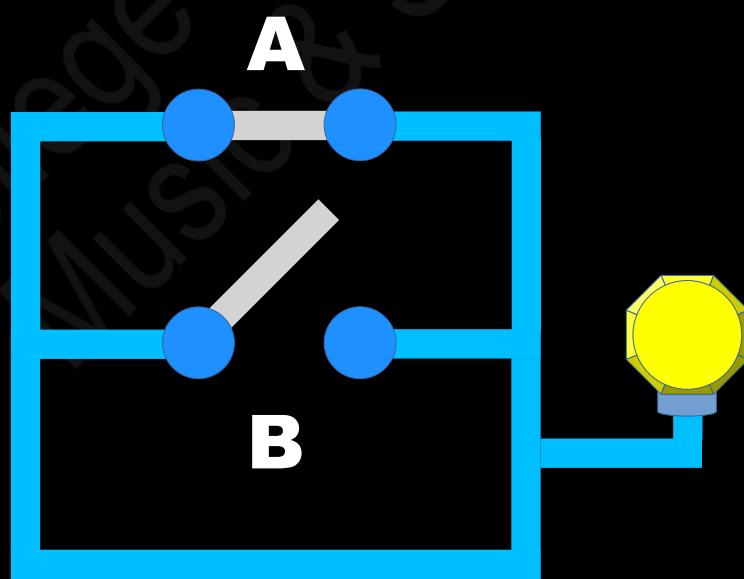
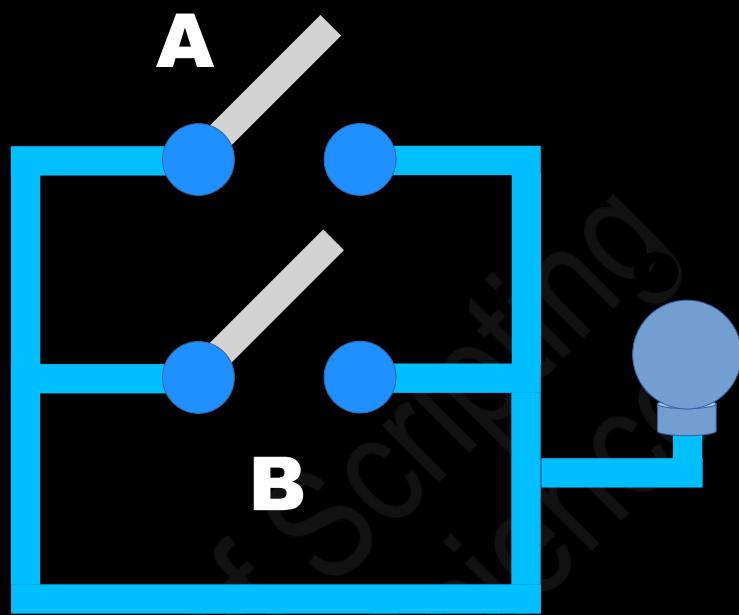
```
    }  
  
    createRobot();  
  
});
```

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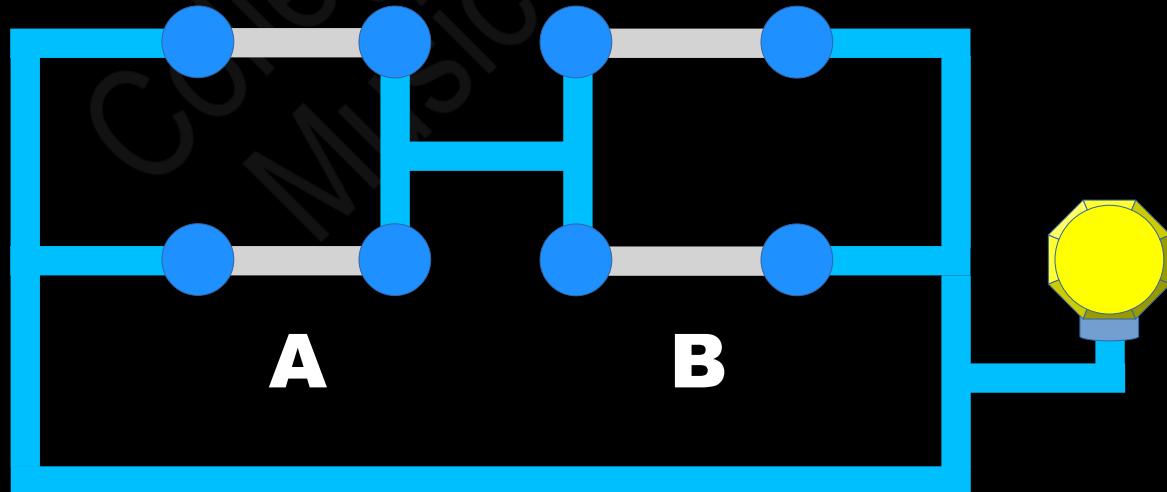
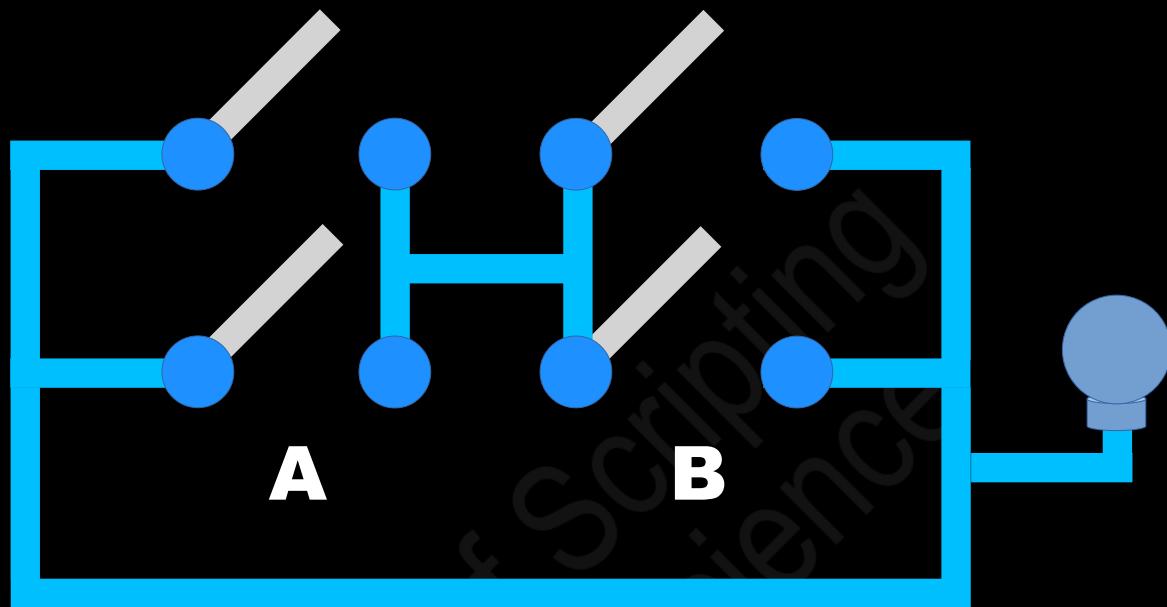
/ and diagram */*



/ or diagram */*

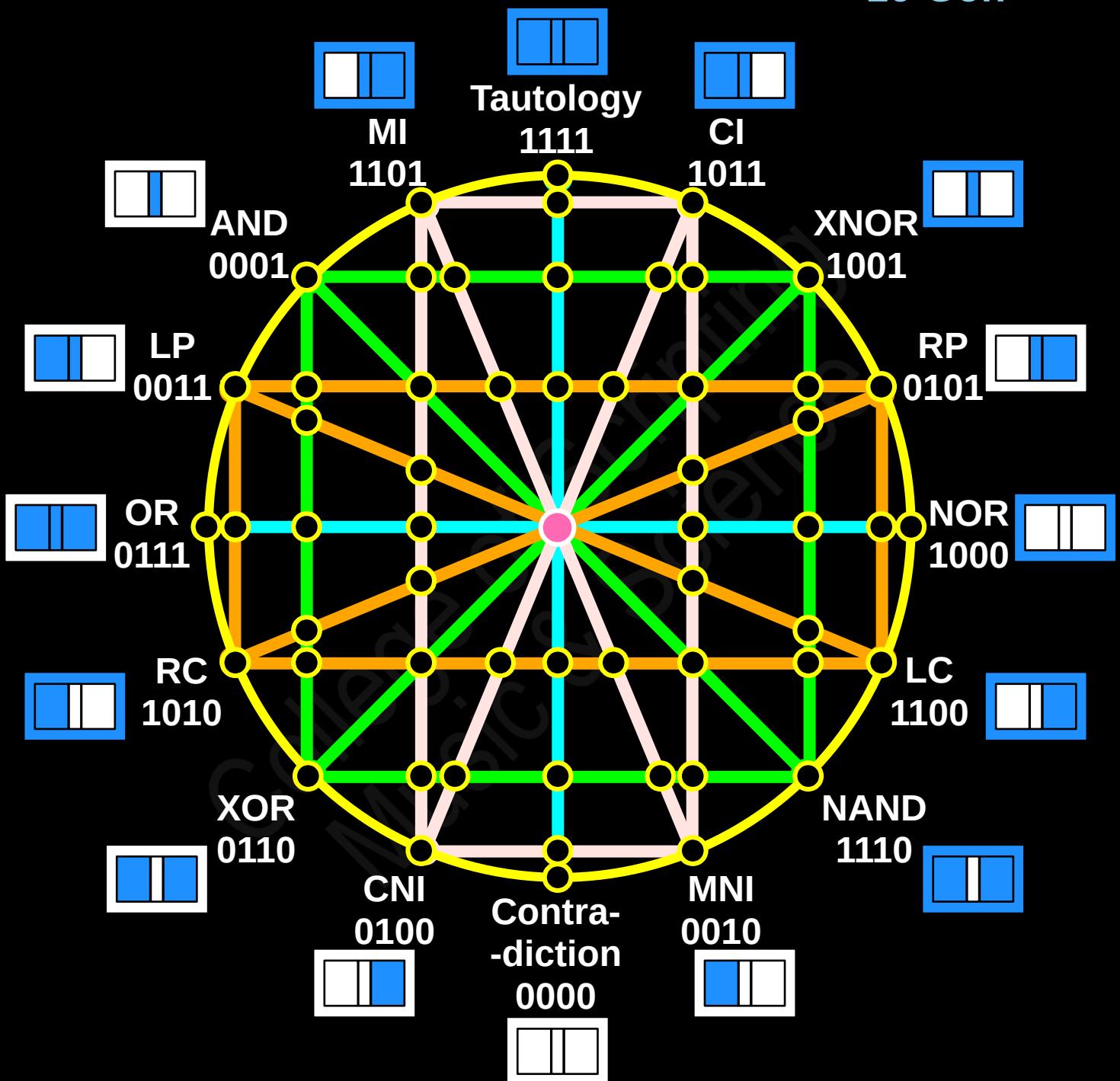


/* and or diagram */



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Dedicated to God the Father

**This book is created by the
College of Scripting Music & Science**

**Always remember, that each time you write
a script with a pencil and paper, it becomes
imprinted so deeply in memory that the
material and methods are learned extremely
well.**

**When you Type the scripts, the same is true.
The more you type and write out the scripts
by keyboard or pencil and paper, the more
you will learn programming!**

**Write and Type EVERY example that you
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