

## Introduction of JavaScript

JavaScript was invented by Brendon Eich in 1995.

- It was developed for Netscape 2 and became the ECMA-262 Standard in 1997.
- European Computer Manufacturers Association Ecma International (formally European Computer Manufacturers Association) is an organization that develops standards in computer and technology.
- ES1 to ES5 (1997 to 2009)
  - ★ After that in 2015 (major changes to follow the rules and regulations) this is called Ecma Script/ES2015/ES6.
- ES6 is standard for JavaScript after that every year new changes came ES7, ES8, ES10, etc.
  - ★ JS is a light weight object oriented programming language
  - ★ Use in form Submit
  - ★ in client side validation
  - ★ Popup / events on click uses

ایک فائل کرنے کا file

Script src = "script.js" > L / script >

## Popup

## Variable and Data types

- Variable - Variable is just like a container.  
Variable is used to store information.
  - It reserves space in memory. Its data can vary but memory location will always remains same.

### • Variable Rules

- Variable's name can't be any keyword. e.g. alert, prompt etc.
- Variable is case sensitive.  
Same name in Capital and small letters are different. e.g. Name or name (both are 2 different variables)
- Variable can be consist of a) Alphabets, numbers, dollar sign and underscore.
- Variable name can't be start with digits (number) its first letter.
- no space allowed.

## AS A Good Programmer

- your Variable name should match with its contents.

when you want 2 words in variable name, so first word start with small letters and second word start with capital letter. e.g. FullName, RollNumber etc.

CamelCase

## Types of Variable

- Var :- (used before EcmaScript 6). this type of Variable can be declared again and again in JS).

After ES6 in modern or advance JavaScript these 2 keywords use for declaration variables.

- Let :- (its value can be changed any time in programming language and can declare and assign in 2 ways e.g. Let name=(declare))

- Const :- it use for constant value e.g. pi value). Its can't be changed. its value must be fixed.

Assigned  
e.g. com  
assign 3

1. Var

1) Block  
declare  
(3).

it will  
not be  
braces.

2) Global

These

in wh

• Com

Single  
multi l

3) Point

• on B

wind

assigned at the time of declaration.  
eg- const name = "Hina"; (declare and assign in some sentence)

### • Variable Scope

1 Block scope Variable:- If variable declare in block of code (in curly braces { }) .

it will alive only in block and will not be accessable after curly braces.

### 2 Global scope Variable:

These variables used globally in whole program.

### • Comments in JS:

Single line:- // let name = "Nusrat";

Multi line:- /\* \*/

### 3 Print / Display in JS

• on Browser:-

```
window.document.write("Nusrat");
```

• In Console:-

```
console.log("Nussat");
```

- Popup:-

```
window.alert("Nussat");
```

Taking Input from user in

• Prompt:- In JavaScript, we use the `Prompt()` function to ask the user for input.

As a parameter, we input the text we want to display to the user.

Once the user presses "OK" the input value is returned. We typically store user input in a variable so that we can use the information in our program.

```
Let answer = prompt("Do you want to send payment in?");
```

In `answer` variable value will be stored and you can print it.

Ch 3

Ques

Primitives

① Number

② undefined

③ Number

so non

so number

datatype

eg:-

④ String

so b

Jai aw

khete

eg:-

⑤ Boolean

so true

## Data Types Primitive & Non-Primitive

Primitive Data Type:-

- ① Numbers
- ② Strings
- ③ Boolean
- ④ undefined
- ⑤ Object (Null)

① Numbers:- Koi bhi aisa data jo numbers me takha jai aur jo numbers me wo use Number datatype khete hain.

e.g.: Let `RollNo = 56;`  
`Console.log(RollNo)`  
`document.write(typeof RollNo)`

② Strings :-

Koi bhi aisa data jo text me takha jai aur +ek me wo use hum String khete hain.

e.g.: - Let `name = "Nusrat";`  
`name = Kiran`  
`Console.log(name);`

③ Boolean:- Koi bhi aisa data jo hum true or false me milte hain.

• value true or false  
• value from Boolean data type  
• whole brain

e.g. Let isPass = true;  
document.write(isPass);  
console.log(typeof isPass)

4 undefined:- aisa data jis me koi value defined nahi ki ho use undefined data khete hain

e.g. Let clas;  
console.log(clas);  
document.write(clas);  
Let percentage.

Null

e.g. Let abc=null;  
document.write(null);

Non- Primitive / composite / datatypes  
• Array,  
• Store multiple value in single variable

• value and syntax  
e.g. Let  
Object -  
• Store multiple values  
• values will be pairs with  
syntax:  
e.g. Let  
null:  
Sub: "C"

variable.

• value written in square brackets [ ]

syntax.

eg: Let info = [s, "hina", "Computer"];  
console.log(info);  
document.write(info);  
document.write(info[1]);

Object:-

• store multiple value in single variable  
• values written in curly brackets { } in pairs with keys

Syntax:

eg: Let student = { name: "hina",  
rollno: 23,  
sub: "Computer" }

PES

## Operators

operators use to perform  
operations like add, subtract,  
multiply, divide etc.

eg.  $a + b$ ,  $a * b$  etc

Expression + Operator

Arithmetic operators

### 0 Arithmetic operation

#### (Addition)

let  $a = 9$ ;

let  $b = 5$

document.write( $a+b$ )  
14

console.log( $a+b$ )  
14

direct result

document.write( $a + " " + b + " = " + (a+b)$ );  
 $9 + 5 = 14$

#### (Subtraction)

document.write( $a - " " + b + " = " + (a-b)$ );  
4

document.write( $a - b$ );  
4

$9 - 5 = 4$

#### (Multiply)

document.write( $a * b$ );

document.write( $a + " * " + b + " = " + (a * b)$ );  
 $9 * 5 = 45$

(Division)

document.write(a/b)  
document.write(a,"/",b,"=",a/b);  
$$9/5 = 1.8$$

(Modulus/ Remainder)

document.write(a,"%",b,"=",a%b,br);  
document.write(a%b)  
$$9 \% 5 = 4 \quad .$$

(Exponentiation) Let  $a = 5$ :  
Power  $2 \times 2 \times 2$  Let  $b = 3$

document.write(a,"\*\*",b,"=",a\*\*b,br);  
document.write(a\*\*b);  
$$5^{3 \times 2} = 125$$

unary operators

Post increment  $a++$ ,  $a = a + 1$   
Post decrement  $a--$ ,  $a = a - 1$   
Pre increment  $+a$   
Pre decrement  $-a$

(Post increment) / Post decrement  
unary operand

$a++$ ,  $a = a + 1$ ; (Post increment)

$a--$ ,  $a = a - 1$

document.write(a));

(document.write(b))  
document.write(a++);

document.write(a);  
(post decrement)

document.write(a--);  
document.write(a);

(pre increment) PHP value Kargi

document.write(--a);  
document.write(a);

(pre - increment) PHP value Plus karo  
document.write(++a);  
document.write(a);

Class:  
== / equal  
!= / not equal  
> /

### ③ Assignment operators (assign value)

Koi new kai value assign karne ke liye = operator

e.g. let a = 8;

a += 4

document.write(a); 12

a -= 3

document.write(a), 5

a \*= 3

document.write(a), 24

+ = a + b / a

- = a - b / a

\* = a \* b / a

% = a % b / a

IF (a == b)  
document

IF (a != b)  
document

if (a != b)

$a / = 3$

document.write(a); 2. 6666

$a \% = 3$  (modulo remainder)

document.write(a); 1/2

$a ** = 3$  (power)

document.write(a) 8x8x8

(conditional operators)

Class: 5 Comparison operators

$= =$  (equal to)  $= = =$  (equal to + some data type)

$! =$  (not equal to)  $!=$  (not equal to & data type)

$>$ ,  $>=$ ,  $<$ ,  $<=$  less

if ( $a > b$ ) {  
document.write("A"); } else {  
document.write("B"); }

e.g. Let  $a = 5$

Let  $b = "5"$

$a == b$  true

$a === b$  false *because data type !=*

if ( $a \neq b$ ) {  
document.write("No") } *اگر a بے b نہیں تو*

{  
document.write("Yes" "No"); } *No*

if ( $a == b$ ) *اس کی دینا تائیں ہی جنکو*

document.write("Hello")

if ( $a != b$ ) *ابھی لے لیں* *لٹا کر دینا*

document.write("You can vote");  
else  
else if (age < 18)  
document.write("You can't vote")  
if (age < 18) you can't vote  
you can not vote

if (age < 18) lets  
document.write("You are child")  
else if (age > 18)  
document.write("You are old")  
else  
document.write("You are")

Logical operators  
logical AND && condition1 & condition2  
logical OR ||  
logical NOT !  
eg: let a = 5;  
let b = 6;  
if (a > 2 && b > 5)  
document.write("both conditions true")

Terminology  
Let  
eg: age  
let a  
let n  
Result  
d  
d

```

else alert("your condition are not true")
if(a>8 & b>5)
document.write("true");
else document.write("false");
if(a>7 || b>5)
{
    alert("hello")
}
else alert("welcome");
if(!a<b)
{
    alert("hell");
}
else {
    alert("well");
}

```

### Ternary operator

ایک لائچی کو اس کیا کہ تو اس کیلئے نہیں پڑتا یہ

e.g. age>18? "adult"; "not adult";

let age=20;

let result;

result = age>18? "adult"; "not adult";

do alert("result");

- String is a sequence of characters used to represent a text
- it is a primitive data type
- we can create string by using template literals and in single and double quotations.

## String Creation and manipulation

- Let str1= "I am learning JS"; //double
- Let str2= ' I am Learning JS' ; //single
- Let str3= ` I am learning JS` ; //template literal (adjacent to 1 key in keypad)

Template Literal ' ' = back tick

## Template Literal

Template literals are a feature of JavaScript that were introduced in ES6. They give you a more flexible and maintainable way of working with strings in JavaScript.

- How to use template lit
- For next line \n

- For tab (space) \t
- for print \ in string
- for write variable in string (variable name)
- For double quotation "Hello" "Hello"
 

eg let str = 'Hello (How are you?)'

let num = 5

document.write('Hello **(num)**');

### Some string properties and methods

- let str = "I am learning";
- let str = "CSS";
- let str = "HTML";
- Position/index Start with 0 in string
- To find Length (str.length)
- To Join strings
 

document.write(str1 + " " + str2);  
 (" ", str2)
- by Concat {3}
 

let str4 = str1.concat(str2).concat(str3);

document.write(str4)

Length  
let str = "Hello";  
let l = str.length;   
document.write(l);  
document.write(str);

Concat  
let str1 = "I am Learning JS";  
document.write(str1)

Let newvar = str.concat(" ", str2);  
document.write(newvar);

Trim

• str.trim() // to remove space from start and end.

• str.trimStart()

• str.trimEnd()

• str.toUpperCase() Change in uppercase

• str.toLowerCase() Change in lowercase

• str.replace("Java", "CSS") search

word and replace (case sensitive  
return boolean)

- str.includes("is") search word is

| / if not found return -1

```
document.write(str.trim());  
document.write(str.trimStart());  
document.write(str.trimEnd());  
document.write(str.trim()  
  (str.toUpperCase());  
document.write(str.toLowerCase());  
document.write(str.replace("is"));  
document.write(str.replaceAll("is"));  
document.write(str.includes  
  ("are"));  
  includes("are"));
```

## switch Case break

```
let sEP = prompt("DO you want  
continue - ?");  
switch (sEP)  
{ case "y":  
document.write("continue");  
break;  
case "yes":  
document.write("continue");  
break;  
case "n":  
document.write("end");  
break;  
case "no":  
document.write("end");  
break;  
default;  
document.write("wrong input");}
```

Template Literal/String

Template literals are a feature in JavaScript that was introduced with ES6. They give you a more flexible and maintainable way of working with strings in JavaScript.

We can write variable in string if string is string template.

Syntax:

- Normal String: `document.write("my doll no is ", variable, " abc");`
  - Template Literal: `document.write(`my doll no is ${variable} abc`);`
- e.g. Let `dollno=66`  
Let `name="Mina"`  
`document.write(`my doll no is ${dollno}`)`  
`my name is ${name}`);`

String manipulation

- We use `\n` for print text in newline
- We use `<sp>` spaces (tab) more than single space in text
- We use `<bs>` single \ in text
- Double quotations in string

document.write("my name is arun in  
my project its Eng")

## Loops - کارباری رکھوں

- To execute a piece of code again
- finite loop and infinite loop
- finite loop (existing point)
- infinite (not end) memory full  
computer hangs

### for Loop

```
for(let i=1; i<5; i++)  
{  
    document.write("hello");  
}
```

- i is block variable, use  $i = 50; i >= 1; i++$  for iteration
- / counting

- first step initialization
- 2nd condition check
- Job task Condition
- true block of code execute
- 3rd step update

## Array Methods & for of Loop

- Array: Non- Primitive datatype
- stores multiple value in single variable
- values written in square brackets [ ]
- values separated by comma.
- each position is called index
- each value call through index number start with 0  
eg: arr[0], arr[1]

### Syntax:

```
let info = [s, "Nus", "Computer"];  
console.log(info);  
info = [ ];
```

length random name k by (document.write(arr.length)).

### Example:

```
let arr = [34, "Nusbat", "Computer"];
```

```
for (let i = 0; i < arr.length - 1;  
let i = arr.length - 1;
```

```
for (let i = 0; i < arr.length - 1; i++)  
{ document.write(arr[i]);}
```

1. ~~for~~ of loop

for (let i of arr) automatically

for (let i = 0; i < arr.length; i++)  
document.write(arr[i]) Point kar

3

## Properties and Methods in Array

(First) Push method

Let arr = [83, "Nussuf", "css", "htm"];

arr.push("java") end me ja kar add  
document.write(arr); kar dega

(Second) unShift method

arr.unshift("cs") add in start

document.write(arr);

3rd Shift method

arr.shift(); Remove a word from

document.write(arr); start

4th Pop method) Remove from

arr.pop();

end

document.write(arr);

5th toString method) Convert

arr.toString();

array to string

document(arr);

## Concat

list

```
let arr2 = ["abc", "ED"]  
arr2.concat("xyz")
```

```
let arr3 = arr1.concat(arr2);  
document.write(arr3);
```

## Index of Method

```
arr1.indexOf("htm"); // position maloom  
document.write(arr1.indexOf("html")); // karana
```

## Slice Method

```
arr1.slice(2); // 2nd element se
```

```
arr1.slice(2, 4); // 2nd to 4th element
```

## Splice Method

```
document.write(arr1);
```

```
splice(2, 1, "xxx");
```

```
let arr5 = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

```
document.write(arr5.splice(2, 1, 4));
```

splice(index, remove)

3 add

2. Delete

3 add

## Loop / For in / while / do...while

### Loop

For in Loop

Object

consist Student =

Name: Anmol

roll no: 35.

}

for (let key in Student)

{

document.write(key)

}

(key, student[key])

Student. Name

document.write(student.name) abe be kar sakte  
hain

for loop

let arr = [1, 2, 3, 4, 5, 6];

for (let i of arr)

{

document.write(i);

of loop or

ke value with

hai aur one

by one print

karta hain

# While and do while loop

## While Loop

Same has if and else as condition but

e.g.      condition phy check

Let  $i=1$       hata hi

while ( $i <= 10$ )

{       $i++$ ;

document.write( $i$ , "hina<br>");

3

=> do while

Let  $i=11$

do

{

document.write( $i$ , "hina<br>");

$i++$ ;

3

    while ( $i <= 10$ );

Phy print kro

phr condition

check kro

ek tare sun

Karta hi

## Function in JS

- A JavaScript function is a ~~block~~ block of code designed to perform a particular task.
- A JavaScript function is executed when "something" invokes it (call it).

e.g:-

```
function abc()
```

```
document.write("www")
```

3

```
abc();
```

html

```
<button> click = "abc()"
```

```
<button>
```

Function definition (define)

```
function fname()
```

F

block of codes

Function invoke  
(call)

```
fname();
```

```
let fname
```

function definition value

function frame ( $P_1, P_2$ )

g

document.write( $P_1 + P_2$ )

h

function sum( $P_1, P_2$ )

function call

i

$ans = P_1 + P_2$ ,

frame (arg1, arg2)

action ans;

or

frame (2, 3)

j

eg:

abc(5, 7);

let ans = sum(2, 3);

console.log(ans);

function abc( $P_1, P_2$ )

document.write( $P_1 * P_2$ );

k

return:

block سے باہر میں ملکے

block میں ملکے

وہ کام 'scope'

let abc;

let bc = 8;

let xyz;

function abc( $P_1, P_2$ )

ans =  $P_1 + P_2$ ;

return ans;

Let  $a = 5$   
Let  $b = 8$   
// Call / invoke  
Let ans = mult(a, b);  
// Function define  
Function mult(p1, p2) {  
 Let ans = p1 \* p2;  
 Return ans;  
}

document.write(ans);

Advance hui

Add new function (ES6)  
const fname = () => { fname()  
 Block of code.

3

e.g.

const mult = () =>

const mult = (p1, p2) => {

let ans = p1 \* p2;

return ans;

// call / invoke

let a = 9;

let b = 8;

let ans = mult(a, b);

document.write(ans);

## Assignment 1

Let totalma = 083;

let name = "NU 58ad";

let tname = "nina";

let clas = "9th";

let emark = 75;

let umark = 99;

let pmark = 100;

let cmark = 80;

let imark = 85;

let total = emark + umark + pmark +  
cmark + imark;

let per = total / 500 \* 100;

IF (per <= 100 && per >= 89)

    E grade = "A+";

else IF (per <= 90 && per >= 80)

    E grade = "A";

else IF (per <= 80 && per >= 70)

    E grade = "B";

else IF (per <= 70 && per >= 60)

    E grade = "C";

else IF (per <= 60 && per >= 55)

    E grade = "D";

else E (grade = "E");



document.write ("**bxz** <td> Percentages  
<td> , per </td> <td> 4667" );

document .writeln ("<b> <td> Grade </td>  
<td> , Grade , </td> <td> 1/687" );