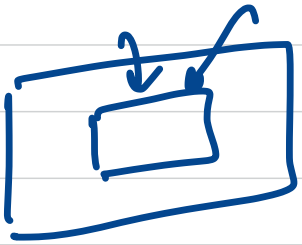
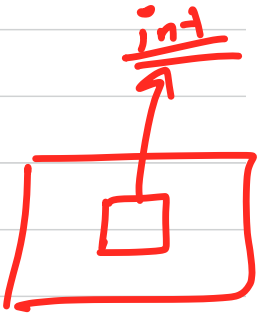
Coercion

↳ Coercion stands for type inter conversion.



implicit

explicit



C++, Java, C → types exist for variables.

↳ int x = 10;

Javascript → types exist for values. let x = 10;
x = "str";

"Everything in JS is an object" → False

let x = true;

How JS handles coercion??

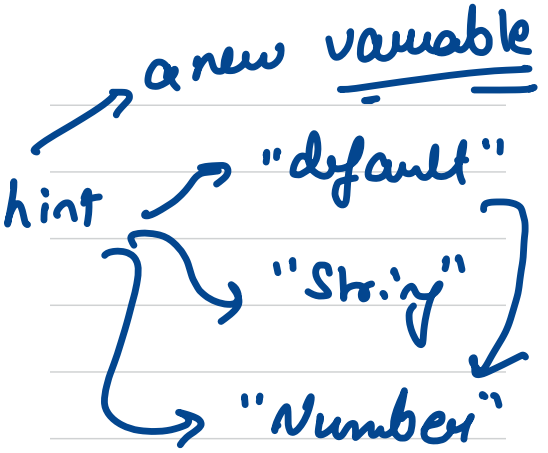
Abstract Operations →

→ first abstract operation that we need to learn is **ToPrimitive**

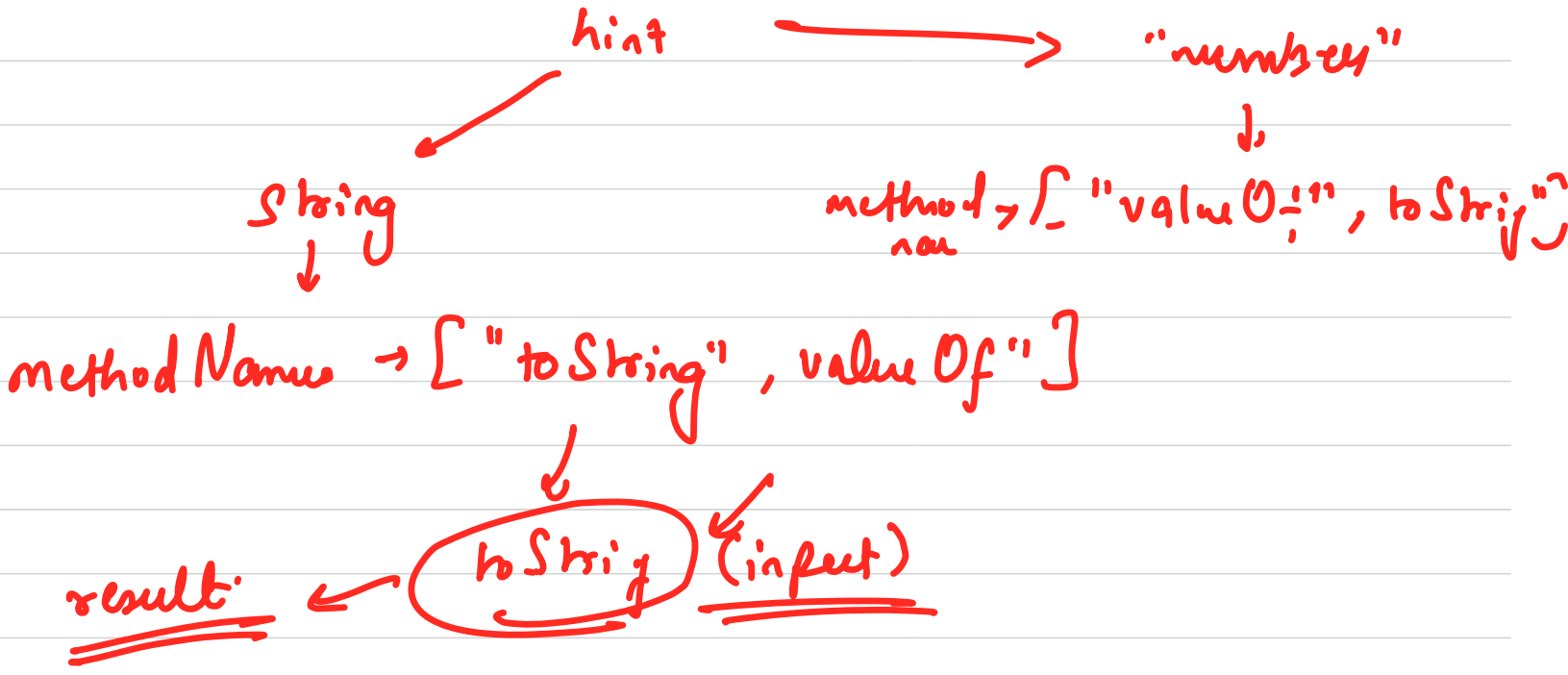
* The ToPrimitive abstract operation, takes an input argument and an optional Preferred Type argument.
* This operation converts the input to a non-object type value. If an argument is capable of getting converted into more than one primitive type, then the func^n uses Preferred Type argument to resolve it.

⇒ As we said, this is also an abstract operation.
that means it is conceptual, we cannot invoke it,
but DS internally can.

1. Assert: *input* is an ECMAScript language value.
2. If Type(*input*) is Object, then
    a. If *PreferredType* is not present, let *hint* be `"default"`.
    b. Else if *PreferredType* is hint String, let *hint* be `"string"`.
    c. Else *PreferredType* is hint Number, let *hint* be `"number"`.
    d. Let *exoticToPrim* be ? GetMethod(*input*, @@toPrimitive).
    e. If *exoticToPrim* is not **undefined**, then
        i. Let *result* be ? Call(*exoticToPrim*, *input*, « *hint* »).
        ii. If Type(*result*) is not Object, return *result*.
        iii. Throw a **TypeError** exception.
    f. If *hint* is `"default"`, set *hint* to `"number"`.
    g. Return ? OrdinaryToPrimitive(*input*, *hint*).
3. Return *input*.



↳ the ToPrimitive function prefers string & number Conversion.


hint
"number"
String
methodNames → ["toString" , valueOf"]
result
toString
(input)

→ if hint/preferred type is number then on our input argument we call valueOf() function to get a number & if it does it gives a primitive we call toString() function.

Otherwise

if hint argument is "String" then we first call toString() & then valueOf()

hint → "Number"

↓

valueOf()

toString()

hint → "String"

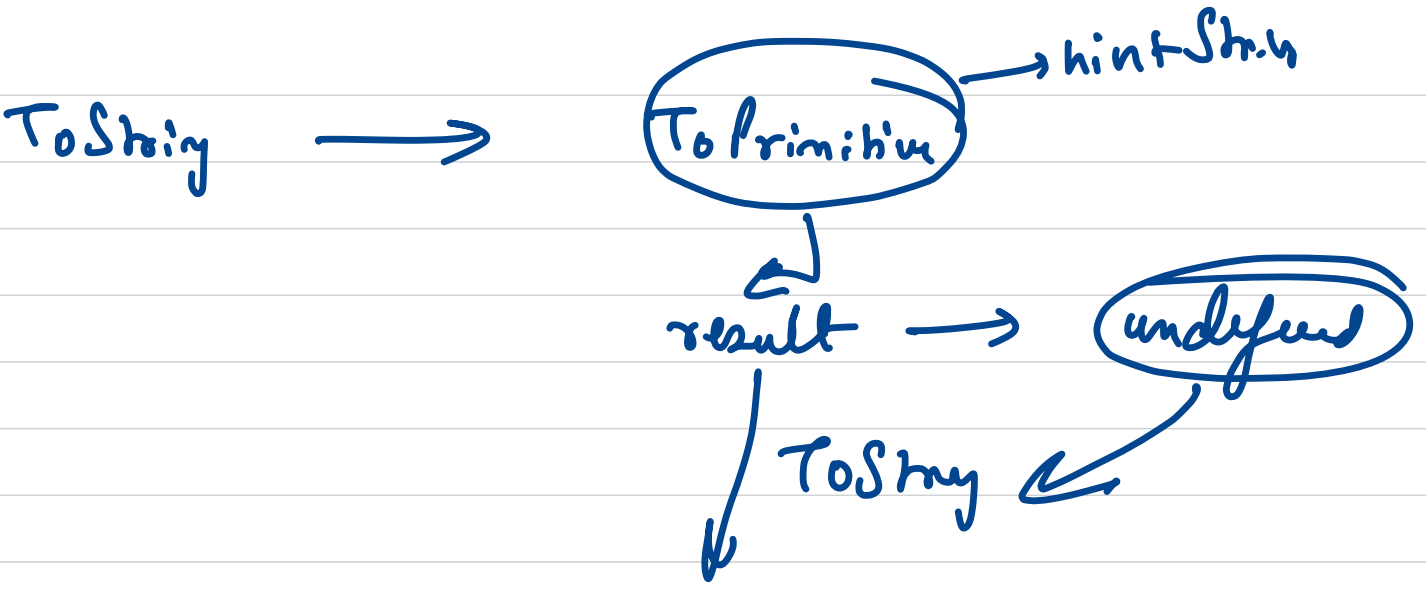
toString()

valueOf()

{ "a" : 5

valueOf : fun() {

}


ToString
ToPrimitive
hint String
result
undefined
ToString

To Number

"" → 0

"0" → 0

"-0" → -0

"3.145" → 3.145

"0." → 0

"." → NaN

⋮

"123" → 123

"12+3" → NaN

[null] → 0

[undefined] → 0

["0"] → 0

[""] → 0

[1,2,3] → Na

hw - 8 = -7

↓

1 - 8 ⇒ -7

"123" → 123

"68234O" → 68234O

"68+347" → NaN

"abc4" → NaN

Whenever in an numeric operation we don't have a number, ToNumber() is called. for example in Subtraction operation.

x = { key : value }

x = { valueOf() { } }

↙

{ valueOf : () { } }

x → { }

object → to primitive
hint → number → valueOf
toString