
ETHAN
LAJEUNESSE
PRESENTS:
ETHANET

LANGUAGE DETAILS

- Name: Ethanet (named after me)
- JavaScript-Like Syntax
- Uses open and closed braces to define a code block:
- Semicolons are required at the end of each statement
- Ex:

```
for (ethan i = 0; i < 10; i++) {
  if (i == 5) {
    continue; // Skips the current iteration when i is 5
  }
  // Operations to execute if i is not 5
}
```

TOKEN TYPES – GENERAL SYNTAX

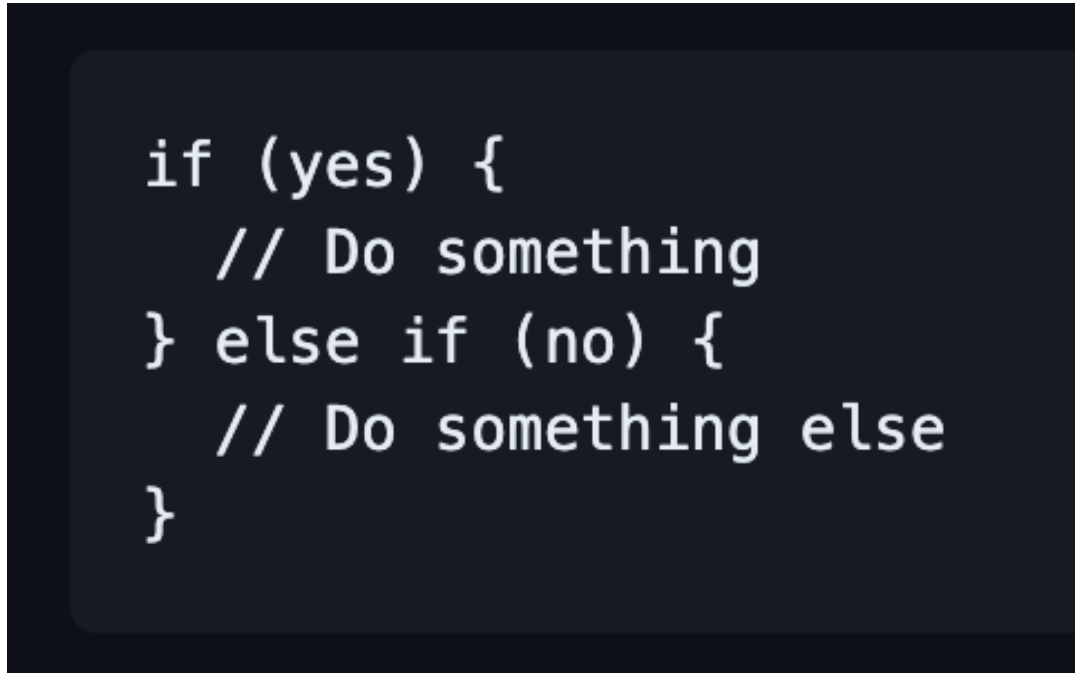
- STRING_LITERAL - "string" or 'string'
- VAR - ethan
- IDENTIFIER - Variable names
- ASSIGN - =
- NUMBER - 1, 2, 3.5, 400, 5, 6500, 7, 8, 900, etc.
- LBRACE - {
- RBRACE - }
- LPAREN - (
- RPAREN -)

TOKEN TYPES – GENERAL SYNTAX

- LBRACKET - [
- RBRACKET -]
- COMMA - ,
- SEMI - ;
- RETURN - return
- NULL - null - Deliberately empty
- UNDEFINED - undefined - Denotes an undefined value
- EOF - Denotes the end of the file
- INVALID - Denotes an invalid token

TOKEN TYPES – BOOLEANS

- TRUE - yes
- FALSE - no



TOKEN TYPES – CONDITIONALS

- IF - if
- ELSE - else

```
ethan x = 10;
ethan y = 11;
ethan z = 12;

if (x == y) {
  // do something
} else if (x == z) {
  // do something else
} else {
  // do something else
}
```

TOKEN TYPES – MATH

- ADD - +
- SUBTRACT - -
- MULT - *
- DIV - /
- MOD - %
- INCREMENT - ++
- DECREMENT - --

```
ethan x = 5;
ethan y = 2;
ethan z = x + y;

z = x + y;        // z is now 7
ethan w = z * 2; // z is now 14
```

TOKEN TYPES – EQUALITY

- EQUAL - ==
- NOTEQUAL - !=
- LESSTHAN - <
- LESSTHANEQUAL - <=
- GREATERTHAN - >
- GREATERTHANEQUAL - >=

- Equal or not equal:

```
ethan x = 10;
ethan y = 10;
ethan z = 12;

x == 10; // yes
x == y;  // yes
x == z;  // no
x != 10; // no
x != z;  // yes
```

- Less than, greater than:

```
ethan x = 10;
ethan y = 10;
ethan z = 12;

x > 9;   // yes
x < 9;   // no
x > y;   // no
x < y;   // no
x >= y;  // yes
x <= y;  // yes
x > z;   // no
x < z;   // yes
```

TOKEN TYPES – LOGICAL

- AND - &&
- OR - ||
- NOT - !

- And (&&)

```
ethan x = 3;
ethan y = 4;

x == 3 && y == 4; // yes
x == 3 && y == 3; // no
x == 4 && y == 4; // no
```

- Or (||)

```
ethan x = 3;
ethan y = 4;

x == 3 || y == 4; // yes
x == 3 || y == 3; // yes
x == 4 || y == 4; // yes
x == 4 || y == 3; // no
```

- Not (!)

```
ethan x = no;
ethan y = !x; // y is yes
ethan z = !y; // z is no
```

TOKEN TYPES – LOOPS

- FOR - for
- WHILE - while
- BREAK - break
- CONTINUE - continue

```
for (ethan i = 0; i < 5; i++) {
  // Code to execute during each iteration
}
```

```
ethan x = 5;
while (x > 0) {
  // Code to execute as long as x is greater than 0
  x--;
}
```

```
for (ethan i = 0; i < 10; i++) {
  if (i == 5) {
    break; // Exits the loop when i is 5
  }
  // Other operations
}
```

TOKEN TYPES – FUNCTIONS

- FUNCTION - laj

```
laj greet() {
  // Function body
  ethan message = "Hello, World!";
  // Print the message or return it
}
```

DATA TYPES?

- For now, Ethanet will allow variables to be anything. This means a number can be assigned to a variable originally defined as a string.
- Therefore, variables can hold:
  - Numbers
  - Strings
  - Arrays
  - Null
  - Undefined
- This may change if it's easier to create the language around enforcing types. If this is the case, we will have implicit typing, where once a variable is assigned a number, it can only be a number.

LEXER GENERATOR

- Lexer Generator: Jison (JavaScript)
- Jison Features
  - Use regular expressions to define tokens
  - Lexer AND Parser generation
  - Define grammar
- To use jison, you can create a .jison file and define the lexer (and parser) rules.
  - Then use the Jison command line tools to generate the parser and lexer
- For purposes of this presentation, I separated the lexer and parser so that it returned tokens

UNIQUE FEATURES

- Define variables with the **ethan** keyword
- Define functions with the **laj** keyword
- Boolean values – **yes** is true, **no** is false
- The **+-** and **-+** operators do nothing
- More to come!

D E M O

```
laj add(x, y) {
        return x + y;
}
```

```
laj factorial(n) {
        if (n == 0) {
                return 1;
        } else {
                return n * factorial(n - 1);
        }
}
```

D E M O

```
for (ethan i = 1; i <= 100; i++) {
        if (i % 3 == 0 && i % 5 == 0) {
                // comment to ignore
                print('fizzbuzz');
        } else if (i % 3 == 0) {
                print('fizz');
        } else if (i % 5 == 0) {
                print('buzz');
        } else {
                print(i);
        }
}
```