🚩 Web Development 🚩
🎖️ Crash Course 🎖️

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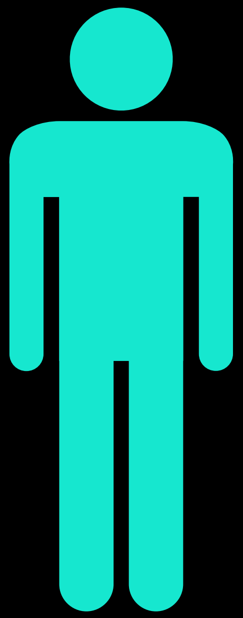
① HTML

Hyper
Text
Markup
Language

HTML =



Tag

```
<name></name>
```

Tag

```
<name>content</name>
```

Tag

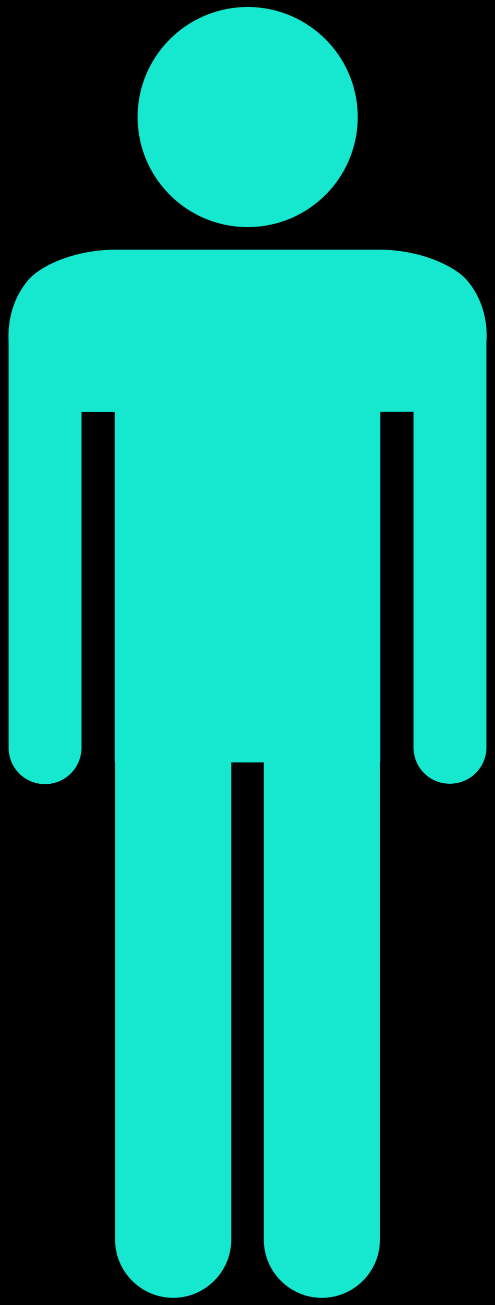
```
<name attribute=“value”>
    content
</name>
```

Self-closing Tag

```
<name attribute=“value” />
```

Structure of Webpage

```
<!DOCTYPE html>
<html>
    <head>
        . . .
    </head>
    <body>
        . . .
    </body>
</html>
```



Structure of Webpage

```
<!DOCTYPE html>
<html>
    <head>
        . . .
    </head>
    <body>
        . . .
    </body>
</html>
```

Structure of Webpage

```
<!DOCTYPE html>
<html>
    <head>
        . . .
    </head>
    <body>
        . . .
    </body>
</html>
```

Structure of Webpage

```
<!DOCTYPE html>
<html>
    <head>
        . . .
    </head>
    <body>
        . . .
    </body>
</html>
```

Structure of Webpage

```
<!DOCTYPE html>
<html>
    <head>
        . . .
    </head>
    <body>
        . . .
    </body>
</html>
```

Metadata Tag

```
<title>
    Name of the Webpage
</title>
```

Metadata Tag

```
<meta attribute="value" />
      charset="utf-8"
      name="???" content="???"
```

Metadata Tag

```
<link rel="" type="" href="" />
```

Text - Heading

```
<h1></h1>

<h2></h2>

<h3></h3>
<h4></h4>

<h5></h5>

<h6></h6>
```

Text - Content

```
<p></p>
```

Text - List

```
<ol></ol>
<ul></ul>
```

Text - List

```
<ul>
    <li>content</li>
    <li>content</li>
</ul>
```

Text - Emphasis

```
<em></em>
<strong></strong>
<strike></strike>
<sub></sub>
<sup></sup>
```

Hyperlink

```
<a href=“” title=“”></a>
```

Absolute Path VS Relative Path

`URL: https://sit.kmutt.ac.th/page1`

/ - Absolute Path

```
/folder1/file.png

= https://sit.kmutt.ac.th/folder1/
file.png
```

./ - Relative Path

```
./folder1/file.png

= https://sit.kmutt.ac.th/page1/
folder1/file.png
```

Image

```
<img src=“” alt=“” />
```

Structure

```
<header></header>
<nav></nav>
<main></main>
<article></article>
<section></section>
<aside></aside>
<footer></footer>
```

Table

```
<table>
    <thead>
        <th>
            <td>Content</td>
        </th>
    </thead>
    <tbody>
        <tr>
            <td>Content</td>
        </tr>
    </tbody>
</table>
```

General Block

```
<div></div>
```

General Inline

```
<span></span>
```

General attribute

```
<name class=“” id=“”></name>
```

Form

```
<form action=“” method=“”>
    <input type=“” name=“” />
    <button>Submit</button>
</form>
```

Comment

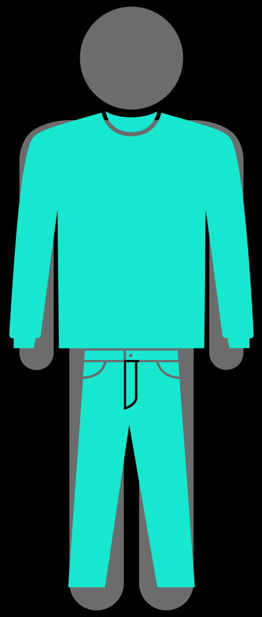
```
<!-- This is comment -->
```

https://htmlreference.io

② CSS

Cascading StyleSheet

CSS =



Selector

```
element {

}
```

Selector

```
element {
    property: value,
    property: value
}
```

CSS in HTML

1. Inline Style
2. Internal Stylesheet
3. External Stylesheet

CSS in HTML - Inline Style

```
<name style=“”></name>
```

CSS in HTML - Internal Stylesheet

```
<style></style>
```

CSS in HTML - External Stylesheet

```
<link rel="stylesheet"
type="text/css" href="" />
```

Selector - HTML Element

```
element {

}
```

Selector - All

```
* {

}
```

Selector - Class

```
.className {

}
```

Selector - Class

```
#id {

}
```

Selector - Many element

```
.class1, #id, element {

}
```

Selector - Descendant

```
.class1 element {

}
```

Selector - Child

```
.class1 > element {

}
```

Selector - Siblings

```
.class1 + element {

}
```

Selector - Attribute

```css
element[attr=value] {

}
```

Selector - Pseudo-class

```
element:hover {

}
```

Selector - Pseudo-element

```
element::before {

}
```

Specificity

Element = 1
Class = 10
ID = 100

Units

px
em
rem
vh
vw
%

Color

```
background
color
```

HEX Code - #123456

Name - Red

RGB - rgb(123,123,123)

RGBA - rgba(123, 123, 123, 123)

Font

```
font-family
font-size
font-style
font-weight
```

sans-serif, serif, monospace

italic

100 - 900, bold

List

```
list-style
list-style-type
```

Box Model

```
padding
margin
```

Positioning

```
text-align
position
```

Absolute VS Relative VS Static

```
position: absolute
position: relative
top
bottom
left
right
```

```
position: static
```

Block VS Inline VS Inline-Block

`display`

Media Query

```
@media (max-width: 1000px) {
    h1 {
        font-size: 30px
    }
}
```

Flexbox

display: flex
flex-direction: ⬆️ column/➡️ row
flex-wrap: wrap/no-wrap
justify-content: flex-start/flex-end/center/space-around/space-between
align-items: flex-start/flex-end/center/stretch

CSS - Comment

```
/*
    This is a comment
*/
```

https://cssreference.io

③ Bootstrap

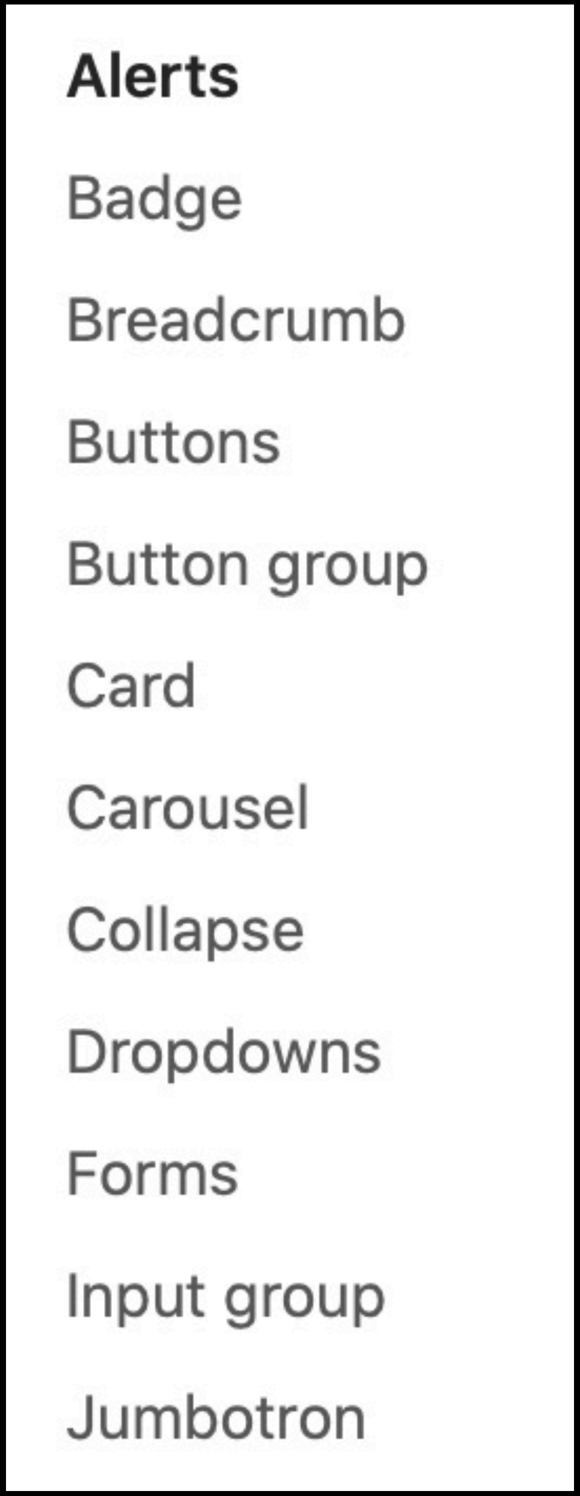
Bootstrap

Open-source component library

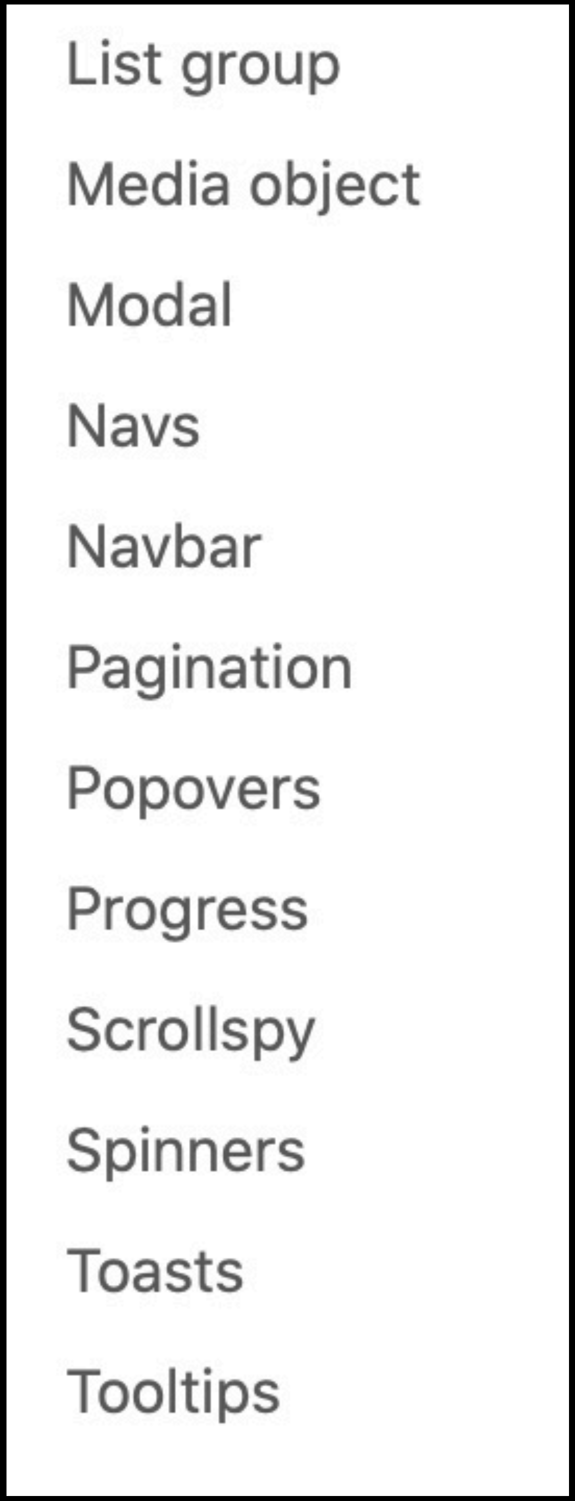
Bootstrap - Layout/Grid

```
.container, .container-fluid
  .row
    .col-xx-xx
```

Bootstrap - Components

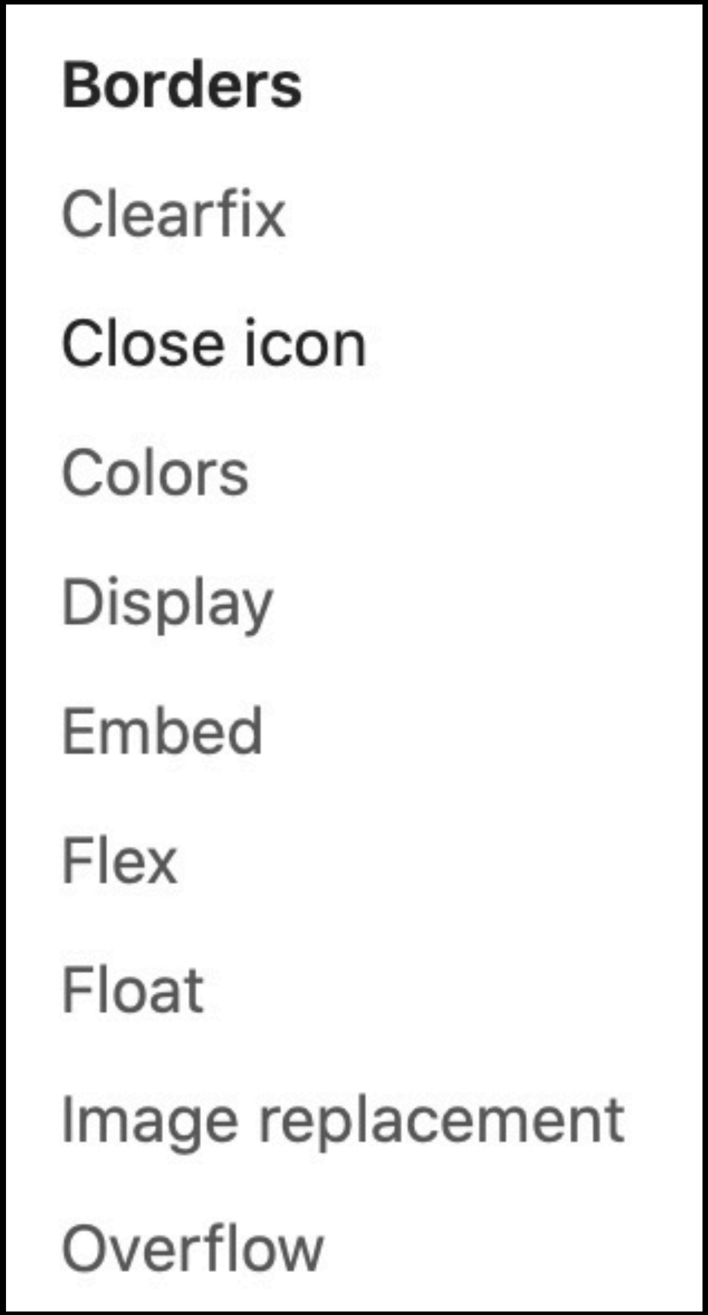


Alerts
Badge
Breadcrumb
Buttons
Button group
Card
Carousel
Collapse
Dropdowns
Forms
Input group
Jumbotron



List group
Media object
Modal
Navs
Navbar
Pagination
Popovers
Progress
Scrollspy
Spinners
Toasts
Tooltips

Bootstrap - Utilities



Borders

Clearfix

Close icon

Colors

Display

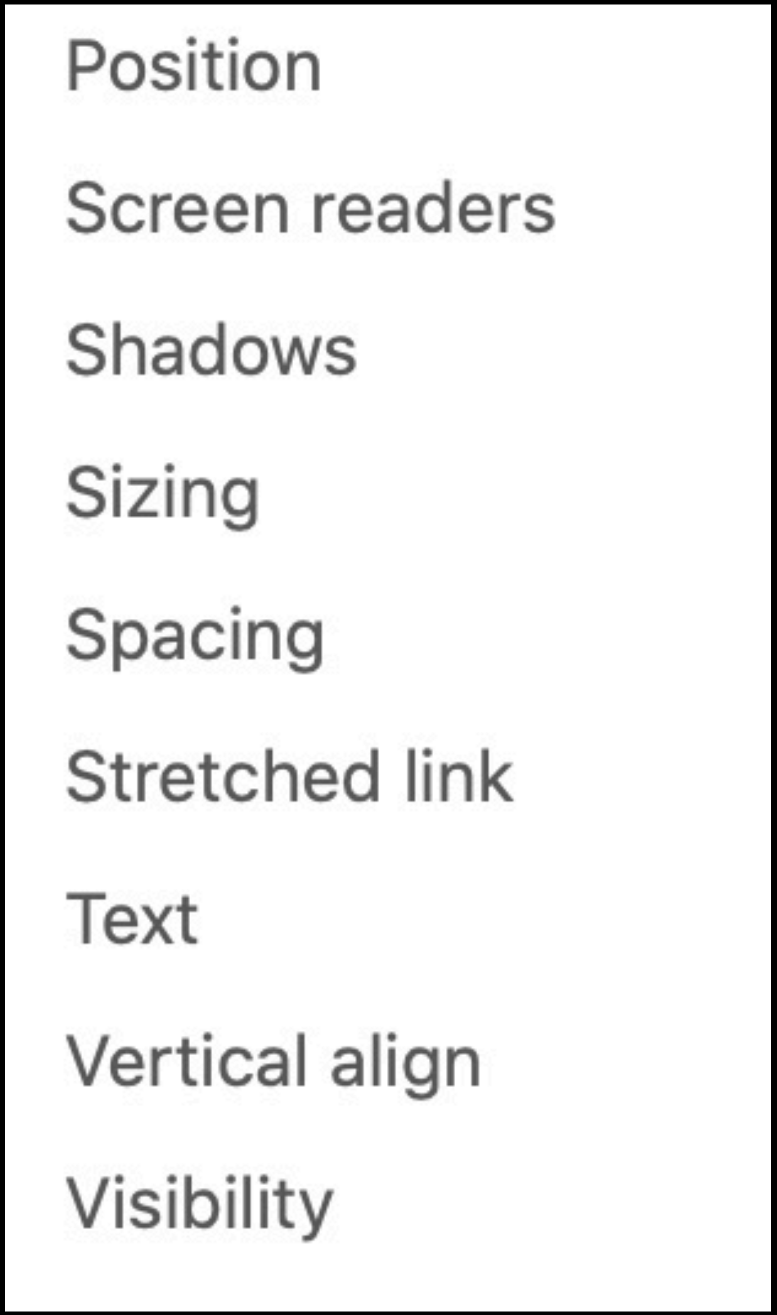
Embed

Flex

Float

Image replacement

Overflow



Position

Screen readers

Shadows

Sizing

Spacing

Stretched link

Text

Vertical align

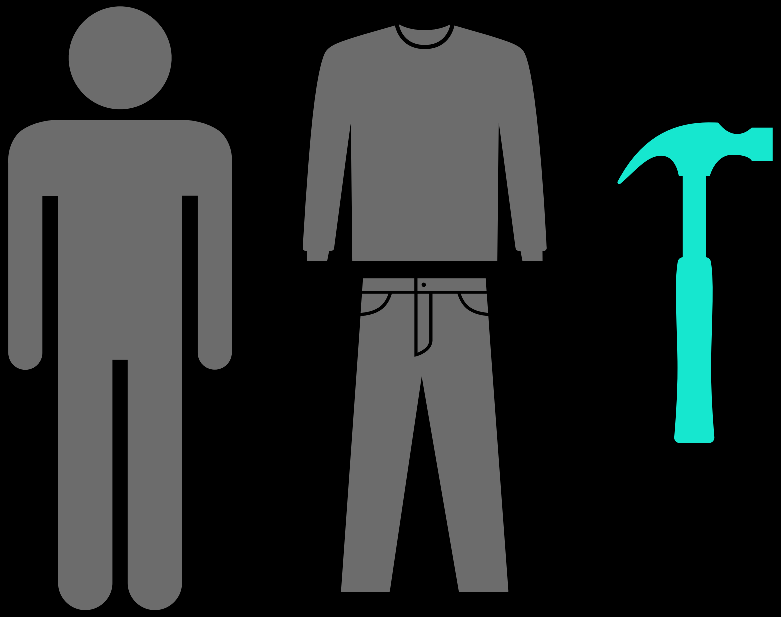
Visibility

Bootstrap - Icon

Font awesome

④ JavaScript

JavaScript =



JavaScript - `console.log`

```
console.log()
```

Naming Convention

https://google.github.io/styleguide/jsguide.html

JavaScript - Variable Declaration

```
var variableName
```

JavaScript - Condition

```
if (condition) {
    // statements
} else if (condition2) {
    // statements
} else {
    // statements
}
```

JavaScript - Comparison (=== vs ==)

=== - Strictly equal
== - Equal

JavaScript - Loop

```
for (var i=0; i < 10; i++) {
    // statements
}

for (var c in arr) {
    // statements
}
```

JavaScript - Array

```
var arr = [1, “Hello World”, 3]
```

JavaScript - String

```
var str = “Hello World”
```

JavaScript - Object

```
var obj = {
    key: value
}
```

JavaScript - Function

```
var func1 = function(parameter) {
    // statements
}

function func2(parameter) {
    // statements
}
```

JavaScript - Comment

```
// This is comment
/*
   This is multiple
   line comment
*/
```

JavaScript with HTML

1. Inline JavaScript
2. Internal JavaScript
3. External JavaScript

JavaScript with HTML - Inline

```
<button onClick=“alert(‘Hello’)”>
    Click Me
</button>
```

JavaScript with HTML - Internal

```
<script>
    alert(‘Hello’)
</script>
```

JavaScript with HTML - External

```
<script src=“”></script>
```

Local Storage

```
localStorage.setItem(
    “name”, “value”
)
localStorage.getItem(“name”)
```

JSON

```
JSON.stringify(obj)
JSON.parse(“JSON String”)
```

setInterval

```
setInterval(function() {
   alert(“Run every 1 second”)
}, 1000)
```

setTimeout

```
setTimeout(function() {
   alert(“1 second passed!”)
}, 1000)
```

DOM API

Representational of Webpage in **Tree**

DOM API - `window`

One of global object that have properties about window (browser)

DOM API - `document`

One of global object that have properties about webpage

DOM API - Element

```
document.getElementById(“id”)
document.querySelector(“css
selector”)
document.querySelectorAll(“css
selector”)
```

DOM API - Element

```
// Get value of the attribute
document.getElementById(“input1”).value;
// Set value of the attribute
document.getElementById(“input1”).value = 1;
```

DOM API - Event Listener

```
document.getElementById(“btn1”)
.addEventListener(“click”, function() {
    alert(“Clicked”);
});
```

⑤ Github

Version Control

No more something like this…

project.V1.pdf

project.V2.pdf

project.VFinal.pdf

project.VFinalFixed.pdf

project.VFinalFixedUpdated.pdf

Git

One of Version Control

Github

Website that run Git

Repository

Place to store code and change

```
$ git init
```

Clone

Download repository from online to machine

```
$ git clone url
```

Staged

File that already added and ready to commit

```
$ git add .
```

Commit

Make a flag that this is one version

```
$ git commit –m “Message”
```

Commit - Convention

[VERB] description without file name

Push/Pull

Push = Upload to Server
Pull = Download from Server

```
$ git push origin master
$ git pull origin master
```

⑥ SQL

CRUD

Create
Read
Update
Delete

SQL INSERT

```
INSERT INTO somewhere
VALUES(values)
```

SQL SELECT Clauses

```
SELECT something
FROM somewhere
WHERE condition
GROUP BY something
HAVING condition
ORDER BY something
```

SQL UPDATE

```
UPDATE somewhere
SET something = value
WHERE condition
```

SQL DELETE

```
DELETE FROM somewhere
WHERE condition
```

⑦ Environment Variables

⑧ Work Flow

⑨ SSH

①⓪ Advanced Github

Branching & Checkout

Like create a duplicate to experiment

```
$ git branch branchName
$ git checkout branchName
```

Merge branch

Merge back to original branch

```
$ git checkout master
$ git merge branchName
```

Merge branch - Conflict

Sometime code cannot go along - FIX IT!

Branch - Convention

master = main branch (stable version)
dev = release candidate for next stable version
feature/name = feature development
hotfix/date = hot fix to fix critical bug

①① ECMAScript 6+

Variable Declaration

```
let variableName
const variableName
```

Arrow Function

```
const f1 = () => {
    // statements
}
```

Default Parameters

```
const f1 = (a = 1) => {
    // statements
}
```

Spread & Rest Operator

```
const f1 = (a, b, c, …others) {
    // statements
}
```

Spread & Rest Operator - Array

```
const arr = [1, 2, 3, 4]
const arr2 = […arr1, 5, 6]
```

Spread & Rest Operator - Object

```
const obj = {
    key: value,
    key2: value2
}

const obj2 = {
    ...obj,
    key3: value3
}
```

Destructuring - Array

```
const arr = [1, 2, 3, 4]
const [a, b] = arr
```

Destructuring - Object

```
const obj = {
    key: value,
    key2: value2
}

const {a: aRenamed, b = 2} = obj
```

Array Function

```
.map()
.forEach()
.sort()
.filter()
.reduce()
```

Template Literals

```
const a = 10
console.log(`Hello, ${a} times`)
```

Class

```
class Person {
    constructor() {
    }
}
```

Asynchronous Programming

```
console.log(“Outer Loop 1”)
setTimeout(() => console.log(
    “Inner Loop”
), 1000)
console.log(“Outer Loop 2”)
```

Promise

```
axios.get(
        “https://api.github.com”
    )
.then(s => JSON.parse(s))
.then(str => console.log(str))
.catch(err => console.error(err))
```

Async/Await

```
async function f1() {
    const s = await axios.get(
        “https://api.github.com”
    )
    console.log(JSON.parse(s))
}
```

Callback

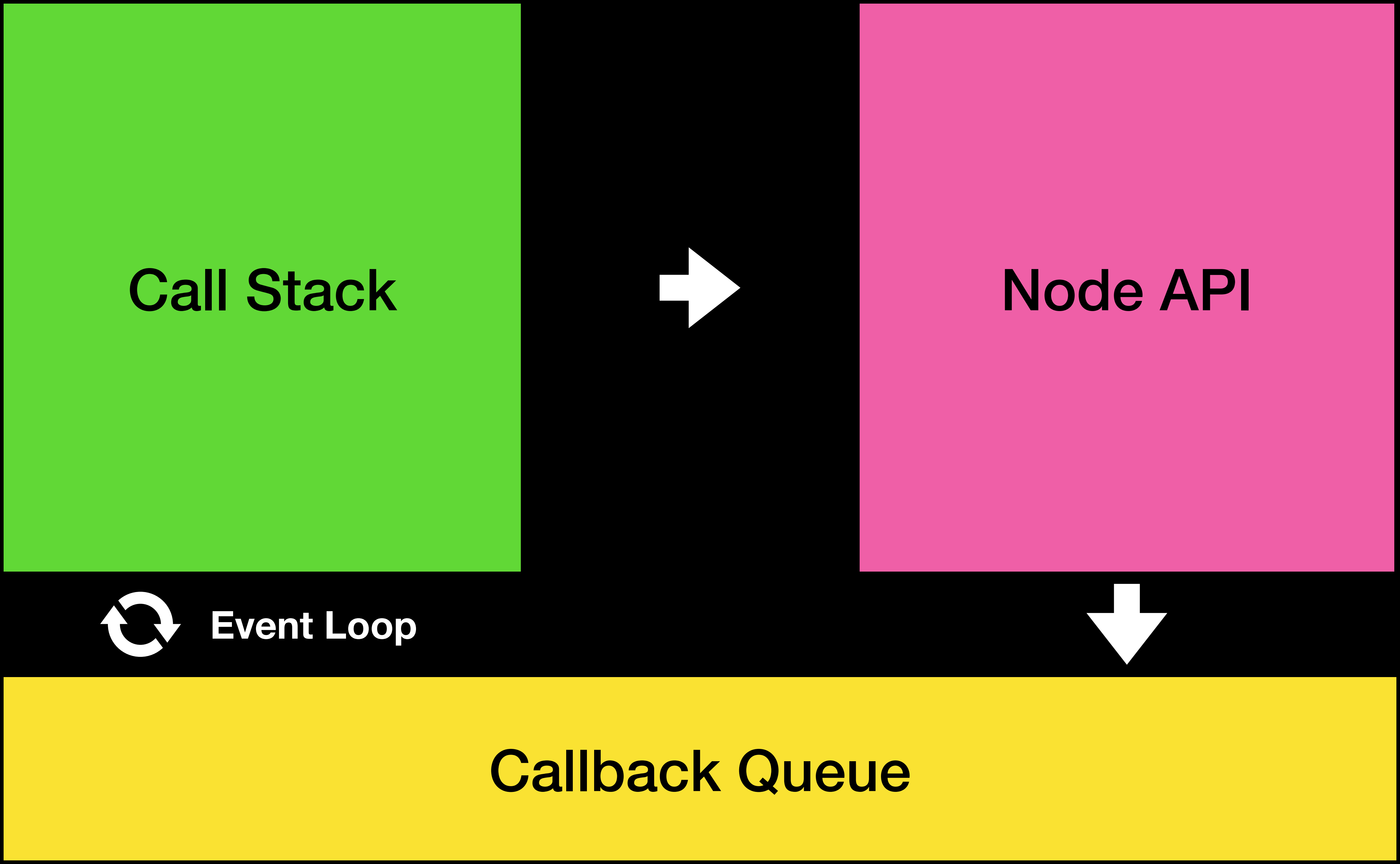
Function that run once the work of the main function finished.

①② NodeJS

NodeJS

Run JavaScript outside web environment

Call Stack & Event Loop



NodeJS - Module System

app.js

```
const fs = require(“fs”)

const utilities = require(“./utils”)
```

utils.js

```
const add = (a, b) => a + b
module.exports = {
   add
}
```

NodeJS - File System

```
const fs = require(“fs”)

fs.writeFile(“test.txt”, data, (err) => {
    if (err) return console.log(err)
    console.log(“File created”)
})

fs.readFile(“test.txt”, (err, data) => {
    if (err) return console.log(err)
    console.log(data)
})
```

Package Manager

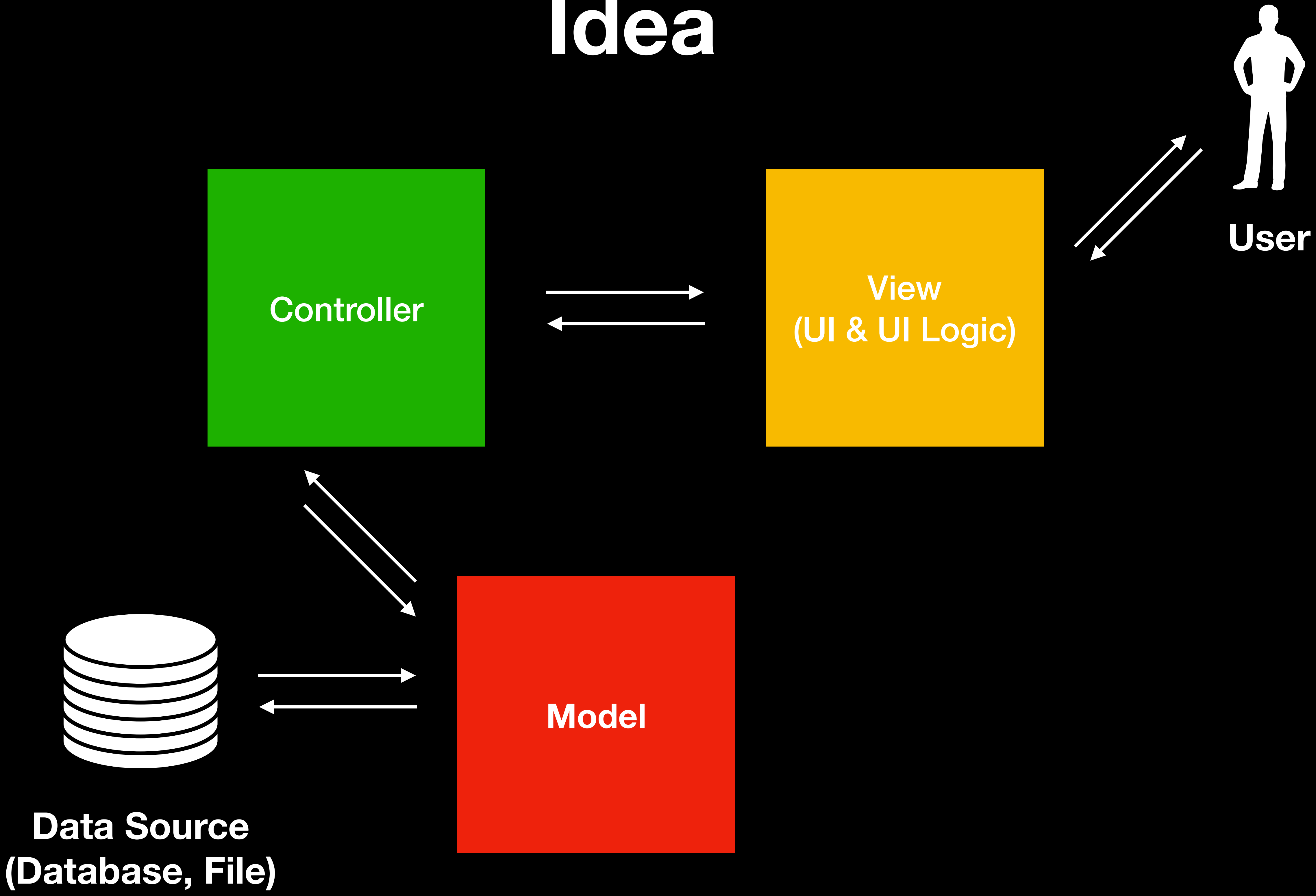
Use other code to help accelerate development

NPM

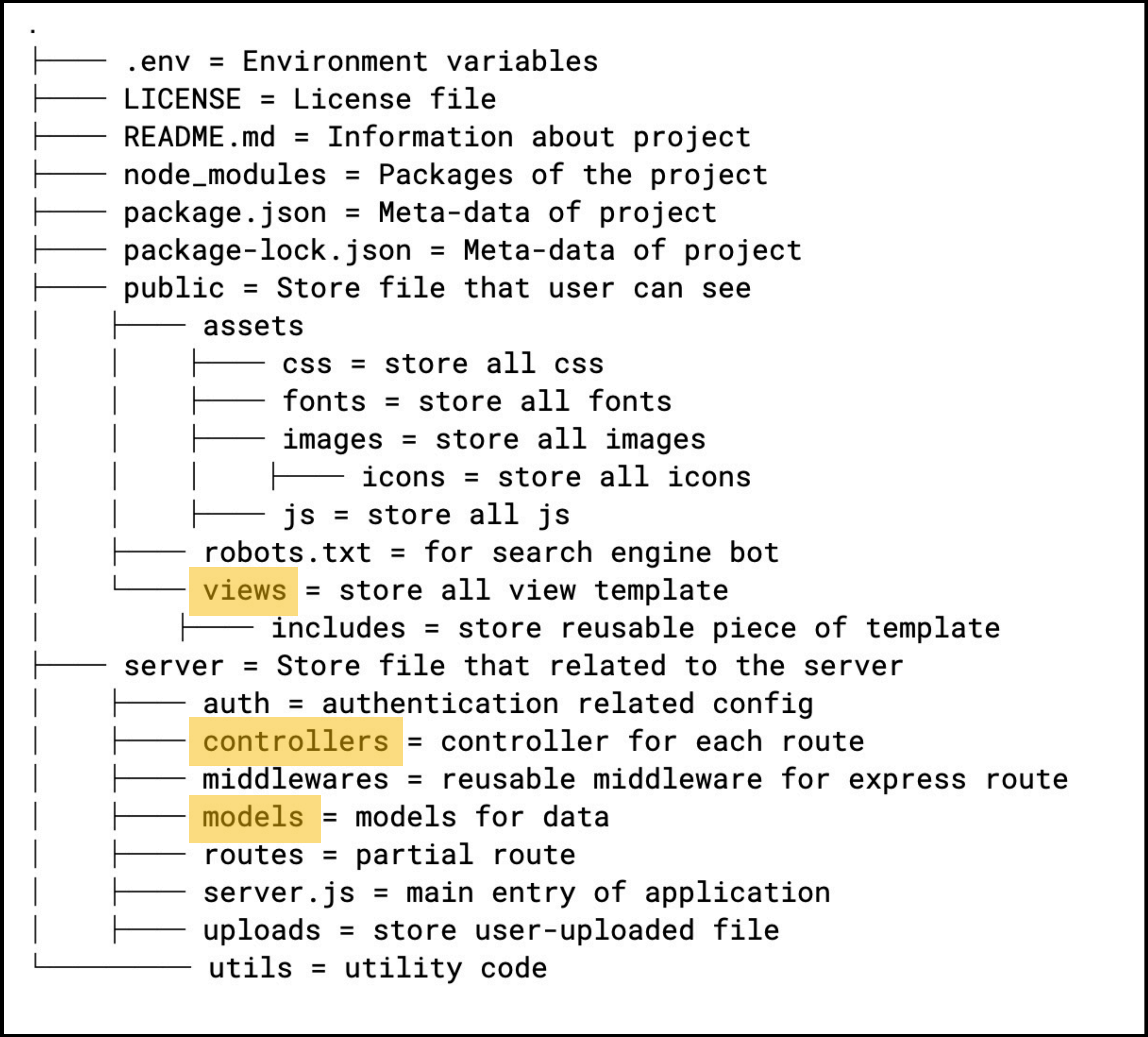
```
$ npm init
$ npm install
$ npm install <package_name>
```

⑬ MVC

Idea


User
Controller
View
(UI & UI Logic)
Model
Data Source
(Database, File)

Project Structure

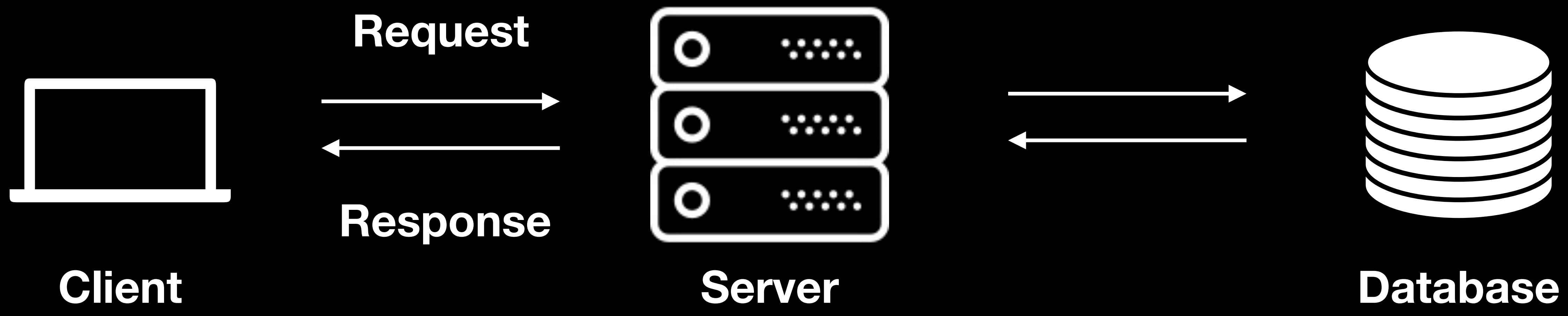


```
.
├──── .env = Environment variables
├──── LICENSE = License file
├──── README.md = Information about project
├──── node_modules = Packages of the project
├──── package.json = Meta-data of project
├──── package-lock.json = Meta-data of project
├──── public = Store file that user can see
|     ├──── assets
|     |     ├──── css = store all css
|     |     ├──── fonts = store all fonts
|     |     ├──── images = store all images
|     |     |     ├──── icons = store all icons
|     |     ├──── js = store all js
|     ├──── robots.txt = for search engine bot
|     └──── views = store all view template
|         ├──── includes = store reusable piece of template
├──── server = Store file that related to the server
|     ├──── auth = authentication related config
|     ├──── controllers = controller for each route
|     ├──── middlewares = reusable middleware for express route
|     ├──── models = models for data
|     ├──── routes = partial route
|     ├──── server.js = main entry of application
|     ├──── uploads = store user-uploaded file
└────────── utils = utility code
```

⑭ ExpressJS

Web Server

3-tier architecture



Express - Hello World

```
const express = require('express')
const app = express()
const port = 3000

app.get('/', (req, res) => res.send('Hello
World!'))

app.listen(port, () => console.log(`Example
app listening on port ${port}!`))
```

Routing

```
app.METHOD(PATH, HANDLER)
```

Routing - Route parameters

```
app.get('/users/:userId', (req, res) =>
res.send(`Hello, ${req.params.userId}`))
```

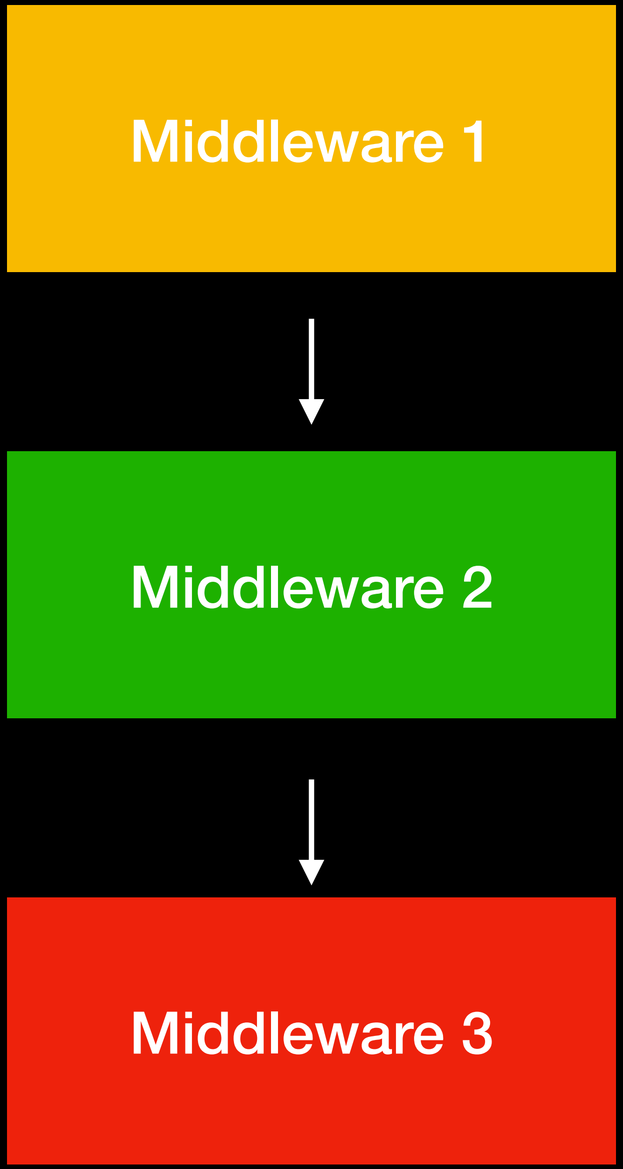
Router

```
const express = require(‘express')
const router = express.Router()
router.get('/', function (req, res) {
    res.send('Birds home page’)
})
router.get('/about', function (req, res) {
    res.send('About birds')
})
module.exports = router
```

Static File

```
app.use(express.static('public'))
```

Middleware



body-parser

`req.body`

JSON

```
res.json()
```

API

```
app.route(‘/books')
  .get(function (req, res) {
      res.send('Get all random book’)
  })
  .post(function (req, res) {
      res.send('Add a book’)
  })
  .put(function (req, res) {
      res.send('Update the book’)
  })
```

①⑤ EJS

Template Engine

Create template
Generate HTML file dynamically

EJS Syntax

`<%` 'Scriptlet' tag, for control-flow, no output

`<%_` ‘Whitespace Slurping’ Scriptlet tag,
strips all whitespace before it

`<%=` Outputs the value into the template (HTML escaped)

`<%-` Outputs the unescaped value into the template

`<%#` Comment tag, no execution, no output

`<%%` Outputs a literal '<%'

EJS Syntax

%> Plain ending tag

-%> Trim-mode ('newline slurp') tag, trims following newline

_%> ‘Whitespace Slurping’ ending tag, removes all whitespace after it

EJS - Include

```
<%- include(‘file/path', {key: value}); %>
```

EJS - Layout

```
<%- include('header'); -%>
    <h1>Title</h1>
    <p>My page</p>
<%- include('footer'); -%>
```

EJS - More Example

```
<% if (user) { %>

<h2><%= user.name %></h2>

<% } %>
```

EJS with ExpressJS

```
res.render(‘filename’, {

   additional: data

})
```

①⑥ RESTful API

Idea

Convention for create API endpoint

HTTP Verb + endpoint

e.g. GET /users

HTTP Verbs

GET

— — —

POST

— — —

PUT
PATCH

— — —

DELETE

GET

Get Data

GET /users = Get all users
GET /users/1 = Get user with ID 1
GET /books/novels/harry-potter-1
= Get harry potter 1 in novels category

POST

Create new data

POST /users = Create new user
POST /books/novels = Create new book in novel category

DELETE

Delete data

DELETE /users/1 = Delete user with ID 1
DELETE /books/novels/harry-potter-8 = Delete harry potter 8 in category novel

PUT

Update data with a new set of data

PUT /users/1 = Update data of user with ID 1 with a new set of data

PATCH

PATCH /users/1 = Update data of user with ID 1 with some new value of existing properties

API Request Client - Postman

POSTMAN

Call API - axios

```
axios.METHOD(url)
  .then(data => console.log(data))
  .catch(err => console.log(err))
```

MySQL in NodeJS

```
// In real development this setting
should be provided and can config
through .env file

const mysql = require('mysql2');
const pool = mysql.createPool({
    host: '35.247.178.19',
    user: 'YOUR USERNAME',
    password: 'YOUR PASSWORD',
    database: 'development',
    waitForConnections: true,
    connectionLimit: 10,
    queueLimit: 0
});
```

MySQL in NodeJS

```
pool.getConnection((err, connection) => {
        if (err) return console.error(err);
        connection.query("SQL COMMAND",(err,
          results, fields) => {
        if (err) return console.log(err);
        console.log(results);
        console.log(fields);
    });
});
```

RESTful API with ExpressJS

```
route.get(“/users”, (req, res) =>
  res.json(Users.findAll()));

route.get(“/users/:userId”, (req,
res) =>
  res.json(Users.findAll({
      userId: req.params.userId
  })));
```

RESTful API with ExpressJS

```
route.post(“/users”, (req, res) => {
    User.create({...req.body});
    res.send(`User ${req.body.userId}
      created!`);
});
```

RESTful API with ExpressJS

```
route.put(“/users/:userId”, (req, res) => {
  Users.update({
      userId: req.params.userId
  },
  {
      ...User.findAll({
        userId: req.params.userId
      }),
      userName: ‘lnwzaa007’
  });
  res.send(`User ${req.params.userId}
    updated!`);
});
```

RESTful API with ExpressJS

```
route.delete(“/users/:userId”, (req, res) => {
   User.delete(req.params.userId);
   res.send(`User ${req.params.userId}
     deleted!`)
});
```

RESTful API with ExpressJS

Note! There is a better way to write code as this one does not have error handling

jQuery

```
$(“css selector”)
```

AJAX - Call API from front-end

```
$.ajax(“/users”, {
    data: {
        name: ‘Pete’,
        github: ‘https://github.com/Pittawat2542'
    },
    method: ‘POST’
})
  .done((data, textStatus, jqXHR) => {
      console.log(data);
  })
  .fail((jqXHR, textStatus, errorThrown) => {
      console.log(textStatus);
  })
```

HTML Form

```
<form action="/users" id="search">
    <h3>Search User</h3>
    <div>
        <label for="id">
          USER ID:
        </label>
        <input type="text" name="id" required>
     </div>
     <button type="submit">Search</button>
</form>
```

Form with AJAX

```
$(“#search”).submit((event) => {
    event.preventDefault();
    const form = $(this);
    $.ajax({
        url: `/users/${form.serialize()}`,
        method: “POST",
       // data: {},
    });
})
.done((data, textStatus) => {
      console.log(data);
  })
.fail((jqXHR, textStatus, error) => {
      $("#result").text(jqXHR.responseText);
  });
```

NodeJS Endpoint

```
route.get(“/users/:userId”, async (req, res) => {
    cosnt { userId } = req.params;
    if (!userId) return res.sendStatus(400);
    try {
        const user = await User.findAll({ userId });
        if (!user) {
            return res.sendStatus(404);
        }
        res.json(user);
    } catch (err) {
        res.sendStatus(500);
    }
}
```

⑰ File

HTML File Upload

```
<form action="/pictures" method="POST"
enctype="multipart/form-data">
    <div>
        <label>Picture</label>
        <input type="file" name="picture" />
    </div>
    <button type="submit">Submit</button>
</form>
```

Multer Config

```
const path = require(“path");
const multer = require(“multer");
const storage = multer.diskStorage({
    destination: (req, file, callback) => {
        callback(null,
          path.join(__dirname, "../uploads"));
    },
    filename: (req, file, callback) => {
        callback(null, file.fieldname + "-" +
          Date.now() +
          path.extname(file.originalname));
    }
});
```

Multer Config

```
const fileFilter = (req, file, callback) => {
    const fileExtension =
      path.extname(file.originalname)
      .toLowerCase();
    if (fileExtension == ".jpg" ||
        fileExtension == ".jpeg" ||
        fileExtension == “.png") {
        callback(null, true);
    } else {
        callback(new Error(`Not supported file
          extension: ${fileExtension}`));
    }
};
```

Multer Config

```
const uploadPicture = multer({
   storage: storage,
   fileFilter: fileFilter,
   limits: {
       fileSize: 5 * 1024 * 1024
    }
}).single(“picture");
```

Handling File in ExpressJS

```
route.post(“/picture”, (req, res) => {
    const userId = req.user.id;
    try {
        multer.uploadPicture(req, res,
          async err => {
        if (err) {
            return res.status(400).send({
                error: err
            });
        }
        await database.createPicture({
            picture_file_name: req.file.filename
        });
        res.redirect(“/complete");
        });
    } catch (err) {
        console.error(err);
    }
};
```

⑱ Utilities

lodash

A modern JavaScript utility library delivering modularity, performance & extras.

Moment.js

Parse, validate, manipulate, and display dates and times in JavaScript.

SweetAlert 2

A beautiful, responsive, customizable, accessible replacement for javascript's popup boxes

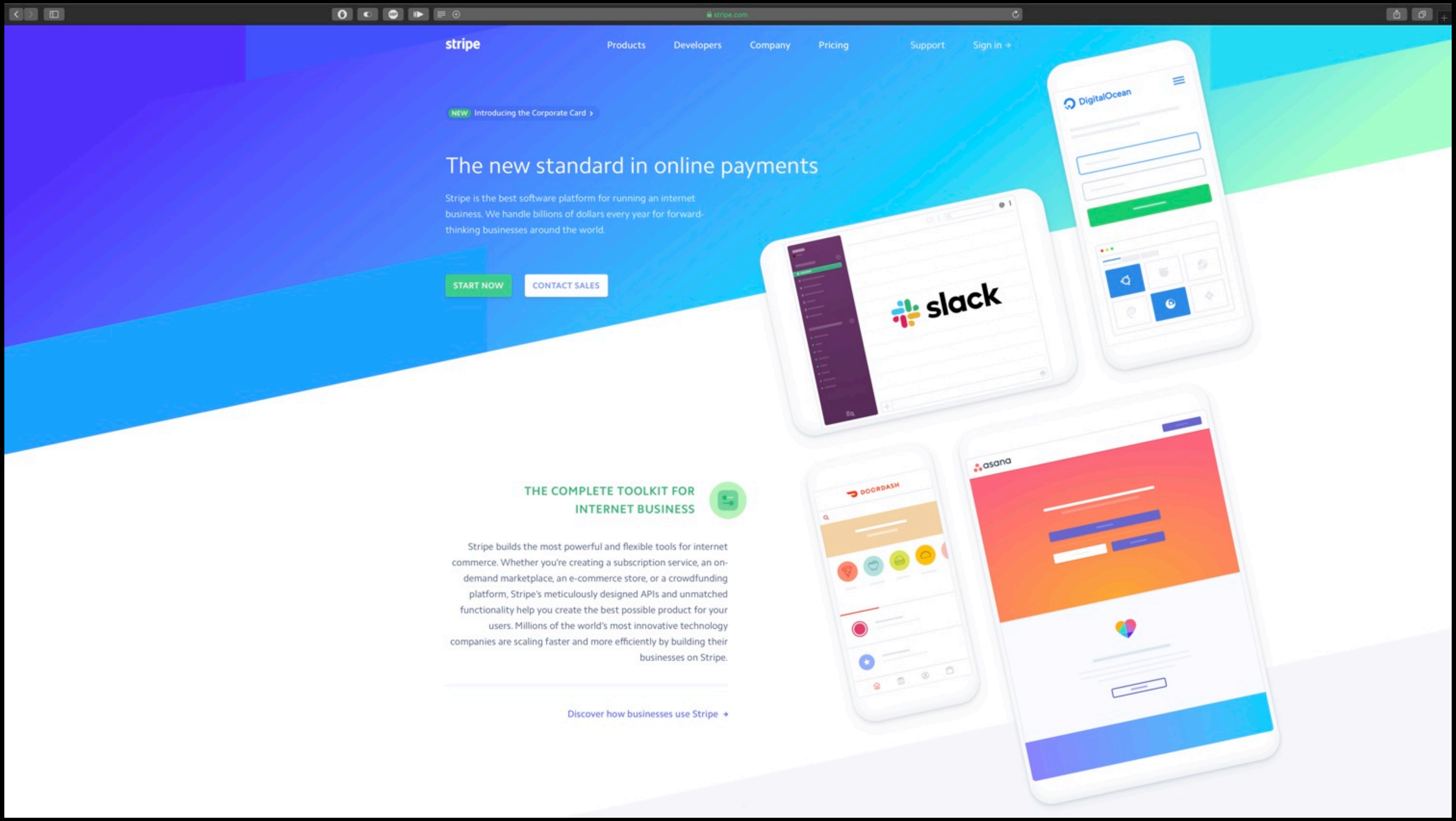
Convention for Development

DB - Model - View - Controller - Route

Let’s see real example on
JPC XV Website

Go on further…

Stripe



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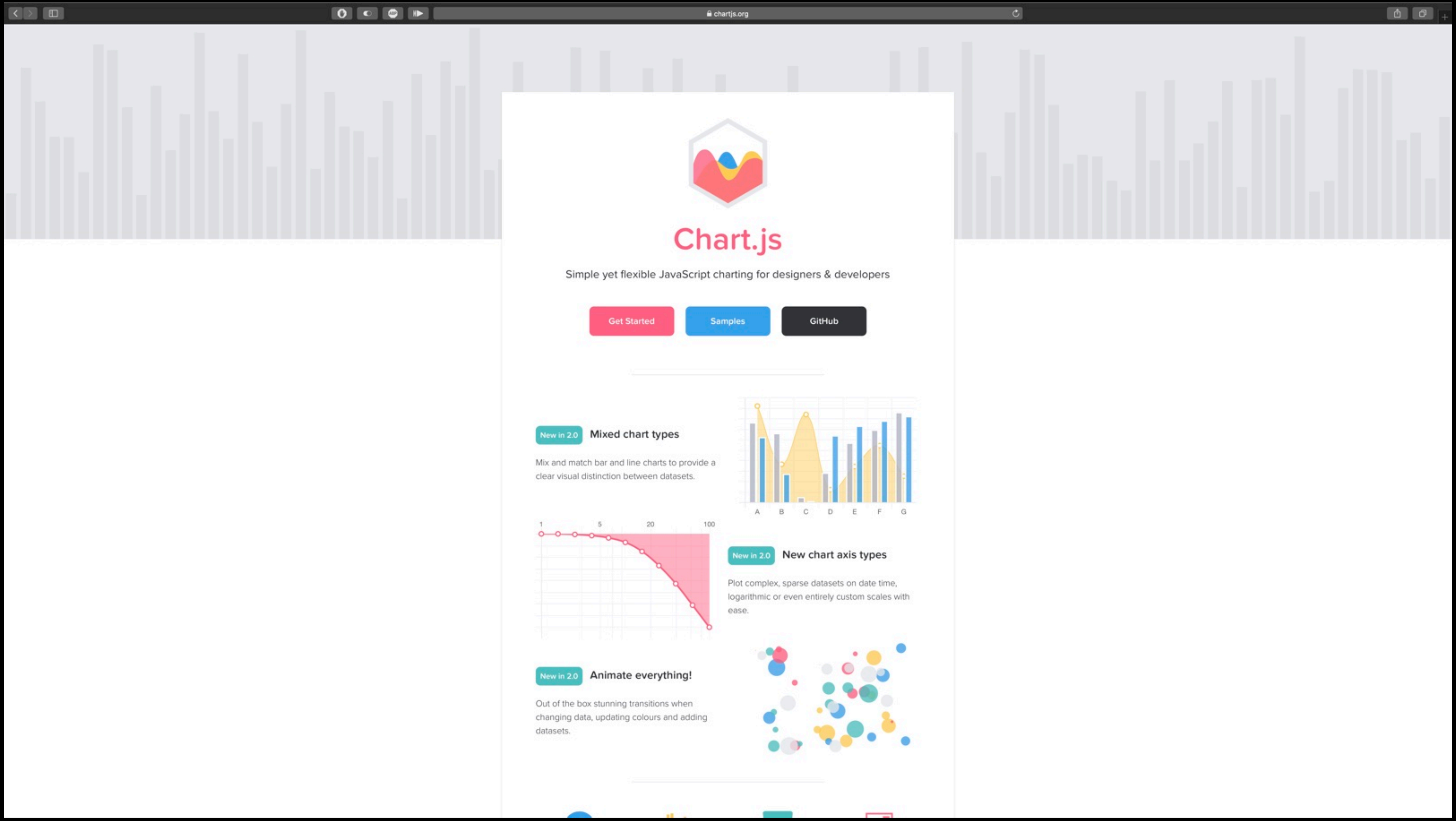
ChartJS



chartjs.org

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🏅End🏅

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