

# Intro to Node.js

Important concepts

# What is Node.js?

- [Node.js](#) a JavaScript runtime environment that runs on the server.
- Server-side JS runs on Node.js (as opposed to client-side JS which runs in the browser).
- Node.js is event-driven and uses a non-blocking I/O.
- Some key concepts which are the foundation upon which Node.js is built:
  - Modularity
  - Asynchronous programming
  - Event loop

# Modularity

- Modularity is the idea of breaking up code into reusable bits of code. This makes maintaining code easier and prevents coding conflicts.
- You have seen some form of modular programming before:
  - Functions
  - Classes, interfaces, superclasses, etc. (data encapsulation)
- We can create modules in JS to encapsulate properties and methods to prevent coding conflicts and protect them from being edited directly outside the module.
  - <https://www.patterns.dev/vanilla/module-pattern>

# Asynchronous programming

- Sequential programming is writing code so that things can only happen in sequence (i.e. code lines must be executed in order).
- **Asynchronous programming** is writing code in such a way that tasks will only be run when ready to run. The tasks can be called and run at any moment.
  - This is important in order to write non-blocking code.
- **Previous examples of code you've used which is asynchronous:**
  - Event handlers (e.g. a button click callback function is only executed upon clicking the button)
- **Good things to look up:** promises, **async/await**

# Event loop

- Node.js code runs on a single thread. This is why it's important to write your code in a non-blocking way.
  - Consider: A single thread can be considered like a one-lane road and each task is a car. One car parked in the road will block all other cars.

**Do not block the event loop!**

# A basic Node.js server

```
const http = require('http');
const port = process.env.PORT || 3000;
const server = http.createServer((req, res) => {
  res.statusCode = 200;
  res.setHeader('Content-Type', 'text/html');
  res.end('<h1>Hello, World!</h1>');
});
server.listen(port, () => {
  console.log(`Server running at port ${port}`);
});
```

- Save the code in a file named *server.js*. In the terminal, with Node.js installed on your computer, run it using **node server.js**
- **Note:** Install the latest **STABLE** (LTS) version. This will make it easier for deployment as well since the stable version is most likely the latest supported on a server/service.