SOEN 287

Server side programming with Node.js (1) fundamentals

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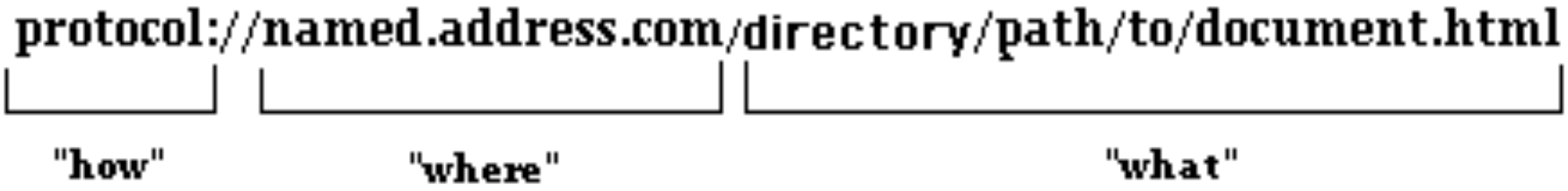
Winter, 2024

The structure of a Uniform Resource Locator (URL)

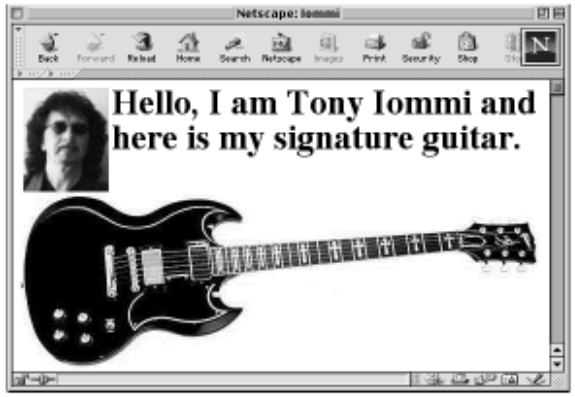


- How: The application layer protocol. Example: Browsers and Web servers use http (hypertext transfer protocol)
- Where: The named address of the resource -- Translated to IP address for internet travel, then used to locate the virtual space (folder) on the Web server.
- What: Path to specific resource in that folder.

A basic HTTP transaction.

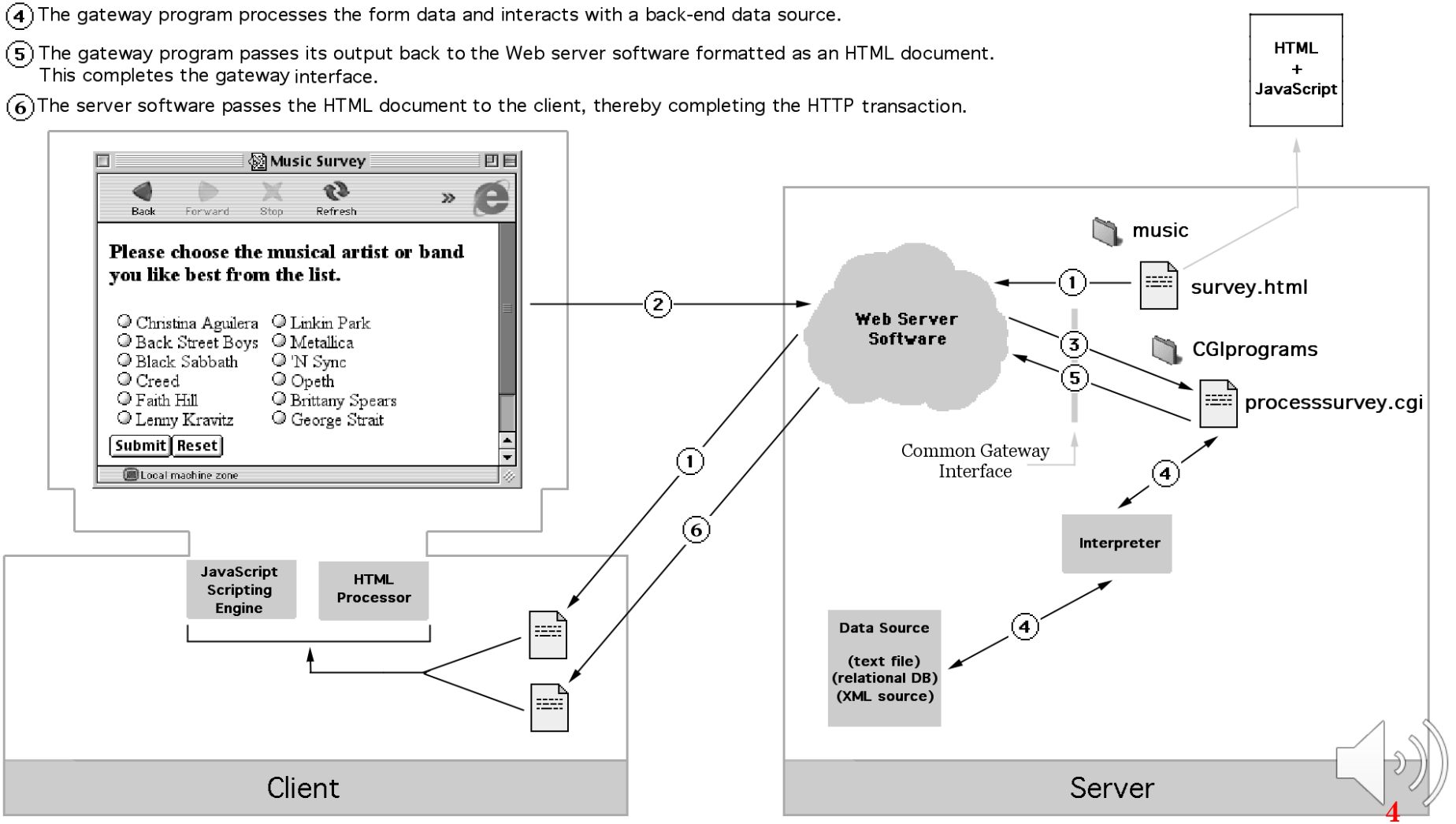
1. URL request `http://music.uweb.edu/iommi.html`
2. A copy of the HTML document is transferred into the browser's cache.
3. The browser starts parsing the HTML code and asks the Web server software to send the two image files. (The "kept alive" socket is still being used.)
4. The image files are transferred into the cache, completing the Web page.

```
<html>
<head>
  <title>Iommi</title>
</head>
<body>
<img src="images/tony.jpg" width="88" height="107" align="left" />
Hello, I am Tony Iommi and here is my signature guitar.
<br /><br />
<img src="images/guitar.jpg" width="535" height="181" />
</body>
</html>
```



A more involved HTTP transaction -- A Web application.

1. The front end of the Web application is passed to the client as an HTML file that contains some JavaScript code. The JavaScript validates the form data on the client.
2. The user submits the form to a program named `processsurvey.cgi` on the Web server. Fundamentally, this is an HTTP transaction between the browser and the server software, but the URL points to an executable gateway program.
3. The server software executes the gateway program and passes it the form data. This is the first part of the gateway interface.
4. The gateway program processes the form data and interacts with a back-end data source.
5. The gateway program passes its output back to the Web server software formatted as an HTML document. This completes the gateway interface.
6. The server software passes the HTML document to the client, thereby completing the HTTP transaction.



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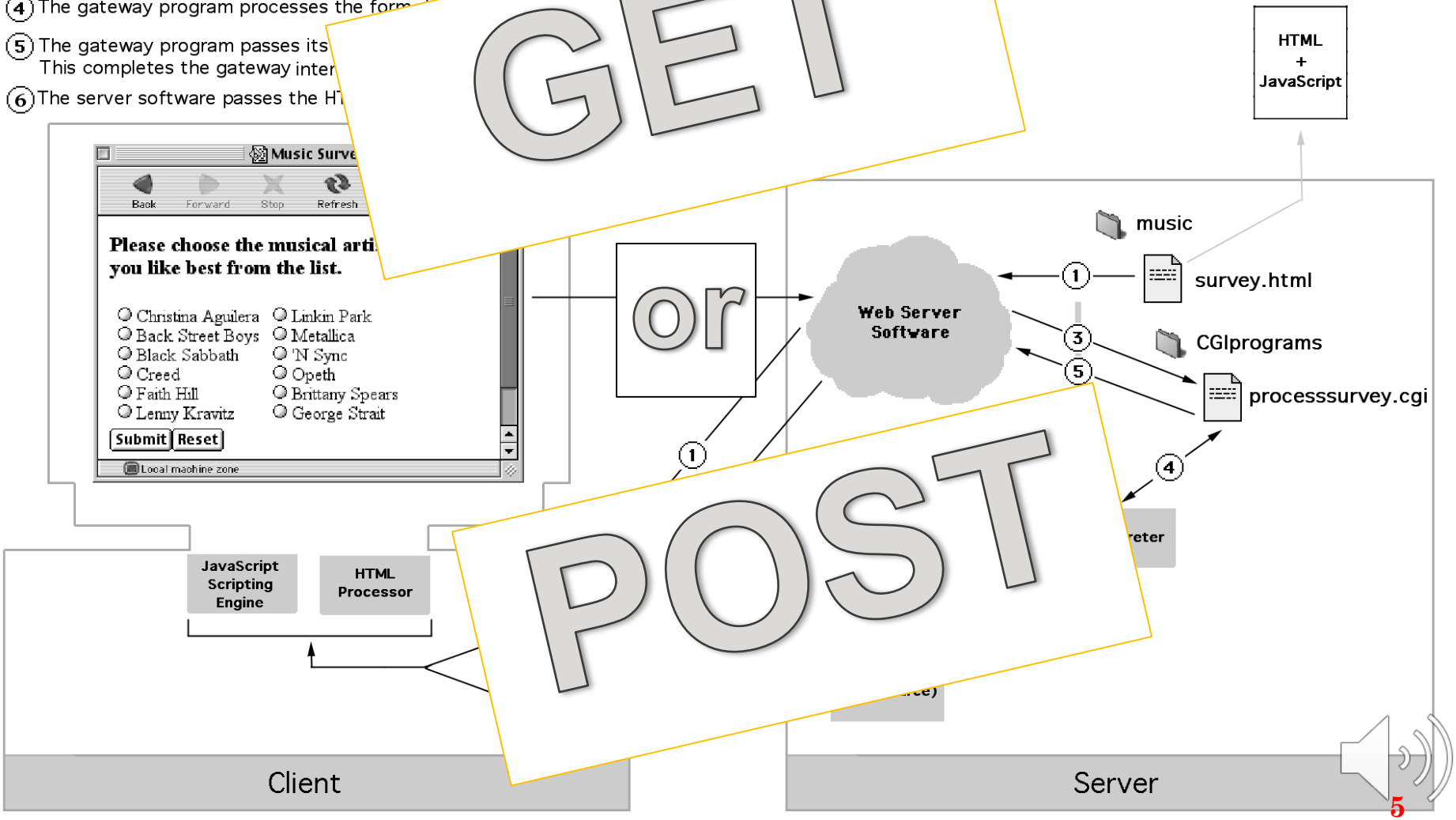
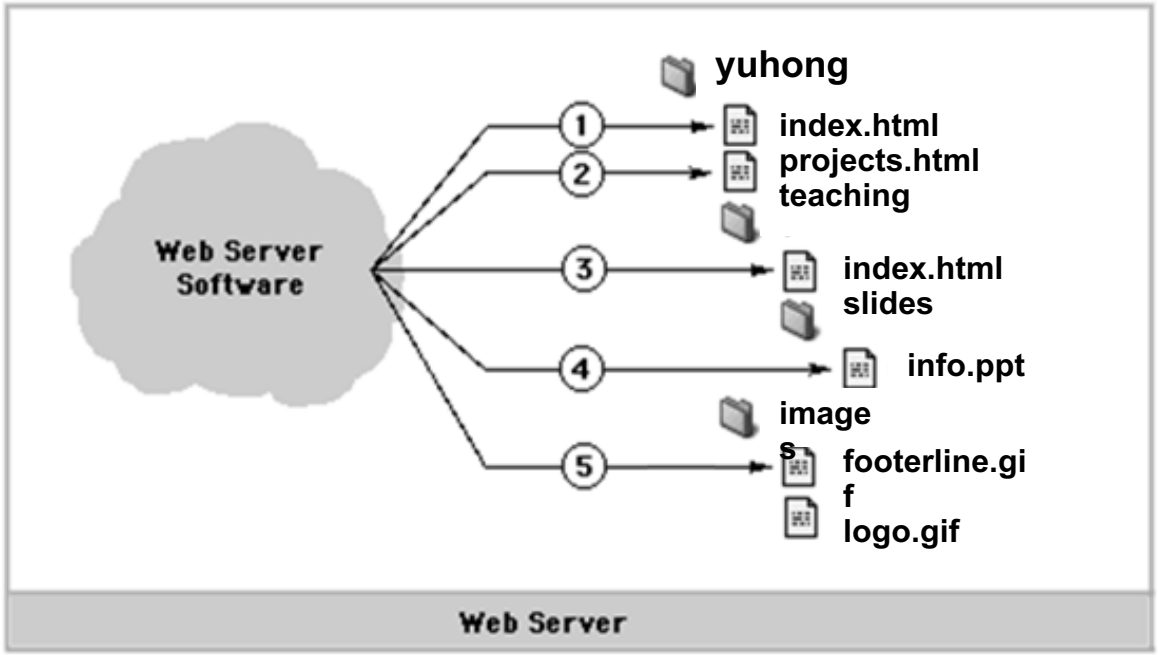
GET

or

POST



File Directories in a Web Server



http://users.encs.concordia.ca/~yuhong/
http://users.encs.concordia.ca/~yuhong/projects.html
http://users.encs.concordia.ca/~yuhong/teaching/
http://users.encs.concordia.ca/~yuhong/teaching/slides/info.ppt
http://users.encs.concordia.ca/~yuhong/images/footerline.gif

HTTP request message

- two types of HTTP messages: *request*, *response*
- HTTP request message:
  - ASCII (human-readable format)

request line (GET, POST, HEAD commands)

```
GET /somedir/page.html HTTP/1.1
Host: www.someschool.edu
User-agent: Mozilla/4.0
Connection: close
Accept-language:fr
```

header lines

non-persistent

Carriage return, line feed indicates end of message

(extra carriage return, line feed)

HTTP response message

status line (protocol status code status phrase)

header lines

data, e.g., requested HTML file

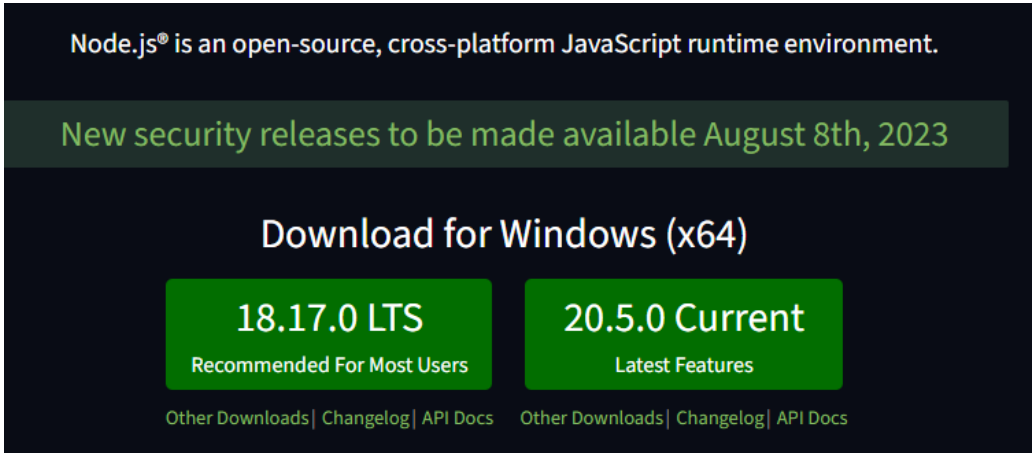
```
HTTP/1.1 200 OK
Connection close
Date: Thu, 06 Aug 1998 12:00:15 GMT
Server: Apache/1.3.0 (Unix)
Last-Modified: Mon, 22 Jun 1998 …...
Content-Length: 6821
Content-Type: text/html

data data data data data ...
```

MIME Type

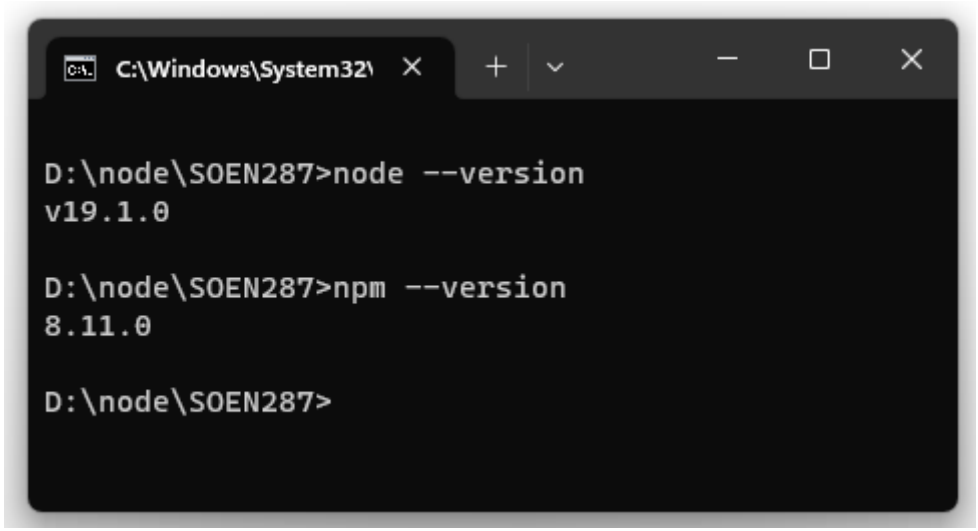
Setup the Environment

- Installing Node.js (nodejs.org) and npm (Node Package Manage



Setup the Environment

- **Check node and npm version**
  - Open a terminal and run following commands
  - node --version



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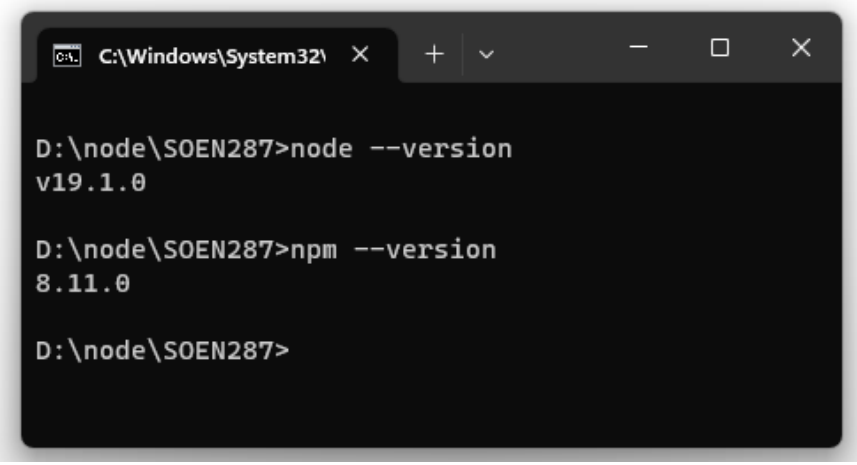
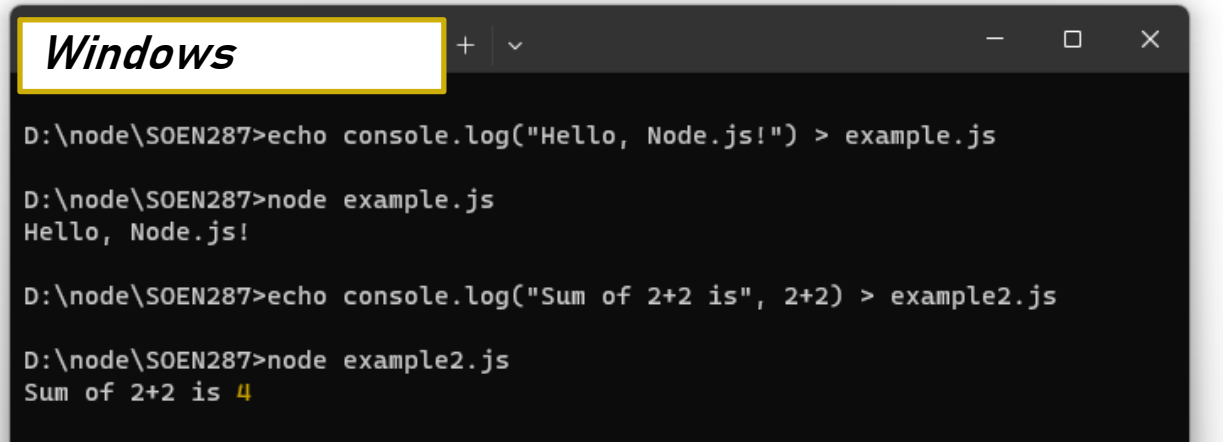
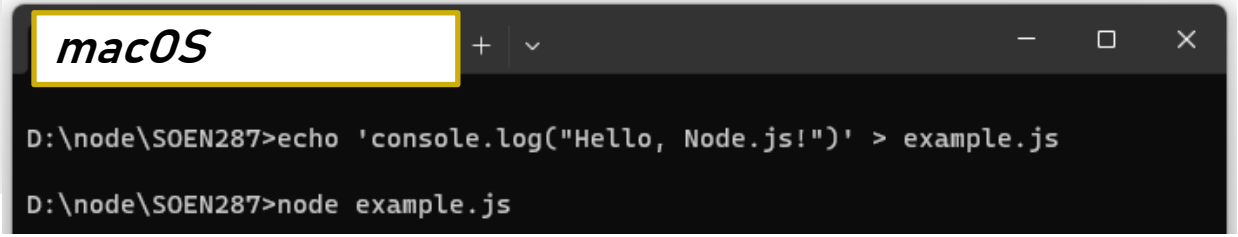


Hello World Example

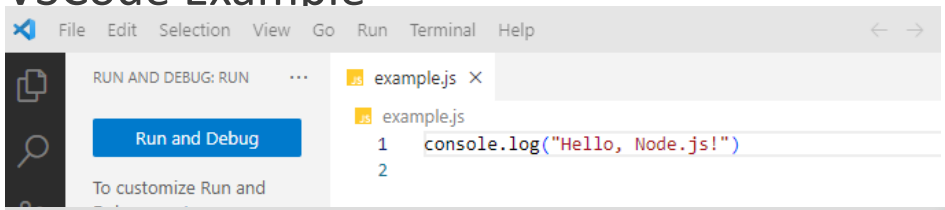
Windows



macOS

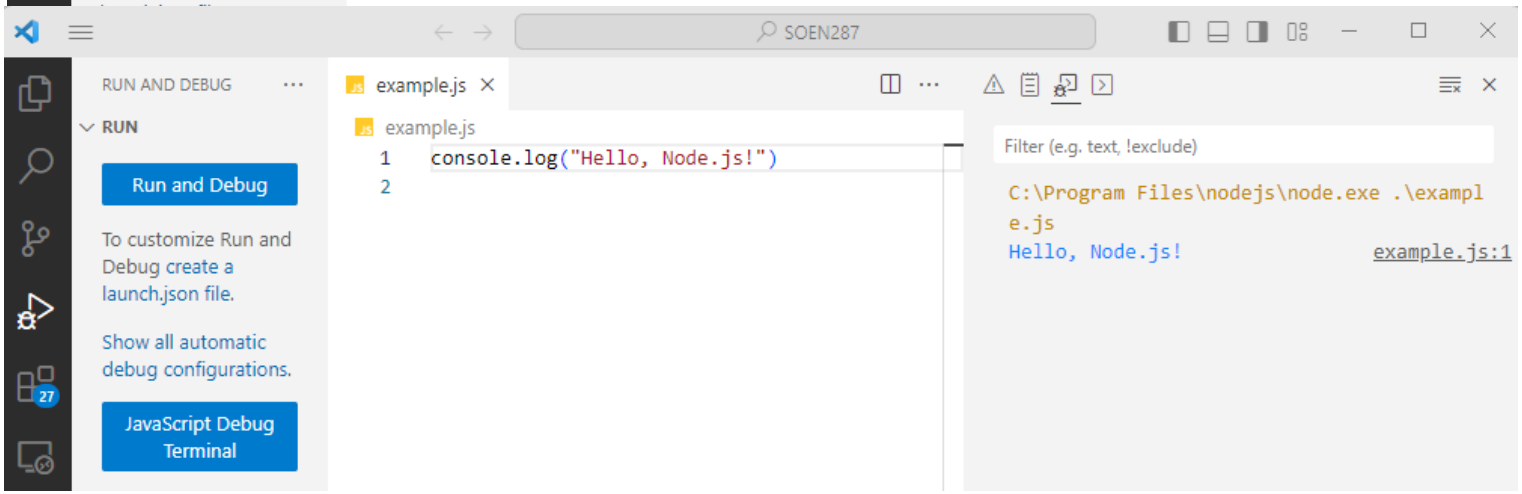


VSCode Example



Step 1

Step 2



Step 3

The End