

# Node JS

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# NodeJS

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- Node.js is an open source server environment.
- Node.js is a JavaScript runtime built on the V8 JavaScript engine.
- Node.js allows you to run JavaScript on the server
- <https://nodejs.org/en>
- Node.js® is a free, open-source, cross-platform JavaScript runtime environment that lets developers create servers, web apps, command line tools and scripts.
- dibuat oleh Ryan Dahl 2009
- Runtime adalah lingkungan untuk menjalankan program.



# Penggunaan nodeJS:

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- Dynamic Single Page Application(SPA)
- Realtime App (chat,multiplayer game)
- API
- Streaming App
- Microservices
- Command Line tool
- MERN,MEAN,MEVN (mongo,express,React,Node,Angular,Vue)

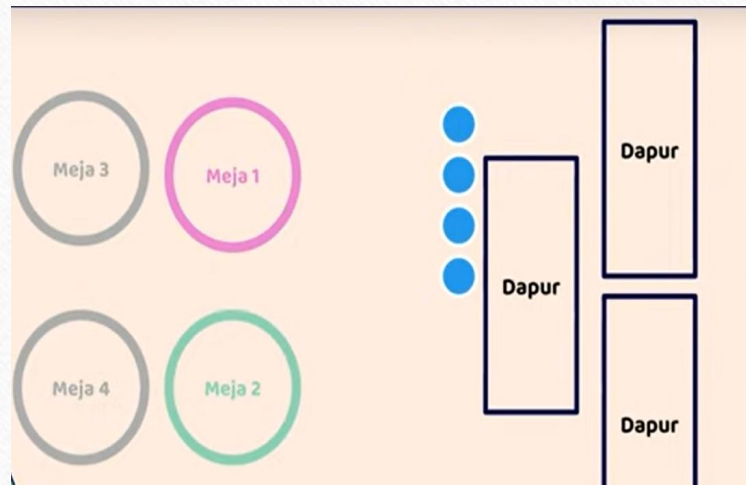
# NodeJS vs PHP

	PHP	NodeJS
Tahun Dibuat	1994	2009
Engine	Zend Engine	Google's V8 Engine
Eksekusi Code	Single-Thread, Asynchronous	Multi-Thread, Synchronous
Web Server	Apache / IIS	Berjalan di runtime sendiri
Package Manager	Composer	NPM

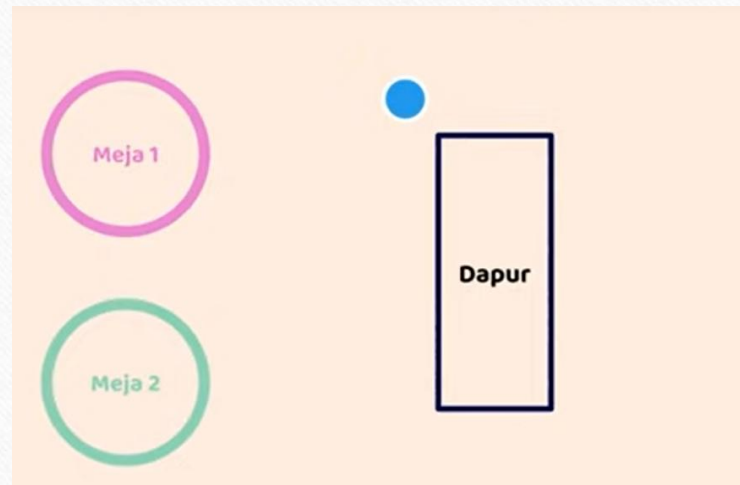
# Arsitektur

- Multi thread , Synchronous/blocking

Blocking/ Synchronous

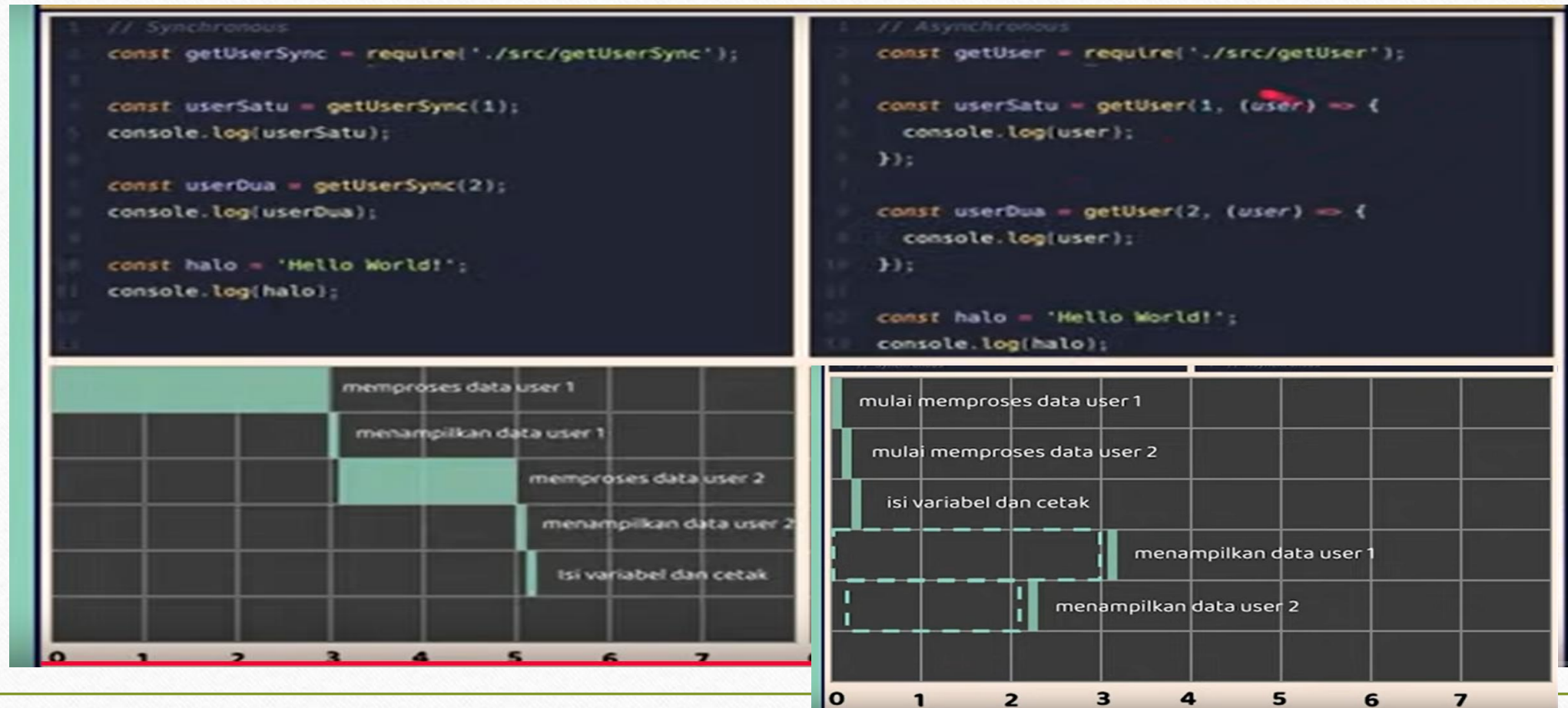


Unblocking / Unsynchronous

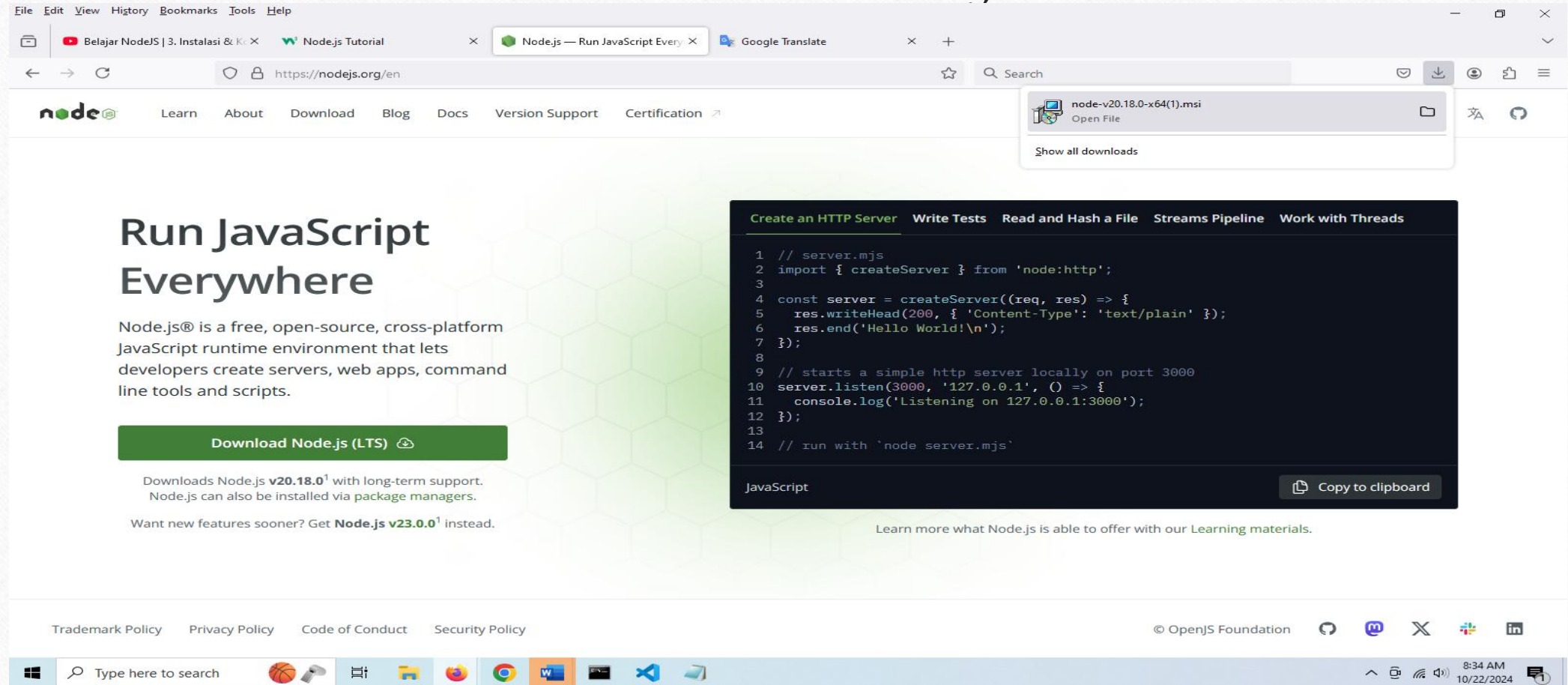




# Arsitektur



# Instalasi NodeJS



The screenshot shows the Node.js website with a code editor overlay. The website header includes the Node.js logo and navigation links: Learn, About, Download, Blog, Docs, Version Support, and Certification. The main heading is "Run JavaScript Everywhere". Below it, a paragraph describes Node.js as a free, open-source, cross-platform JavaScript runtime environment. A green button labeled "Download Node.js (LTS)" is prominent. Below the button, it states "Downloads Node.js v20.18.0<sup>1</sup> with long-term support. Node.js can also be installed via package managers." and "Want new features sooner? Get Node.js v23.0.0<sup>1</sup> instead." The code editor overlay shows a JavaScript code snippet for creating an HTTP server. The code is as follows:

```
1 // server.mjs
2 import { createServer } from 'node:http';
3
4 const server = createServer((req, res) => {
5   res.writeHead(200, { 'Content-Type': 'text/plain' });
6   res.end('Hello World!\n');
7 });
8
9 // starts a simple http server locally on port 3000
10 server.listen(3000, '127.0.0.1', () => {
11   console.log('Listening on 127.0.0.1:3000');
12 });
13
14 // run with 'node server.mjs'
```

Below the code, it says "JavaScript" and "Copy to clipboard". At the bottom of the code editor, it says "Learn more what Node.js is able to offer with our Learning materials."

The browser window shows the URL "https://nodejs.org/en" and a download bar with the file "node-v20.18.0-x64(1).msi". The Windows taskbar at the bottom shows the search bar and various application icons. The system clock shows 8:34 AM on 10/22/2024.



# REPL

- Read Evaluate Print Loop
- Debuging
- Execute app lewat termina

```
C:\> Command Prompt - node
D:\belajar\webDev\nodeJS>cd\
D:\>cd belajar/webdev/nodejs
D:\belajar\webDev\nodeJS>node
Welcome to Node.js v19.6.0.
Type ".help" for more information.
>
```



# REPL

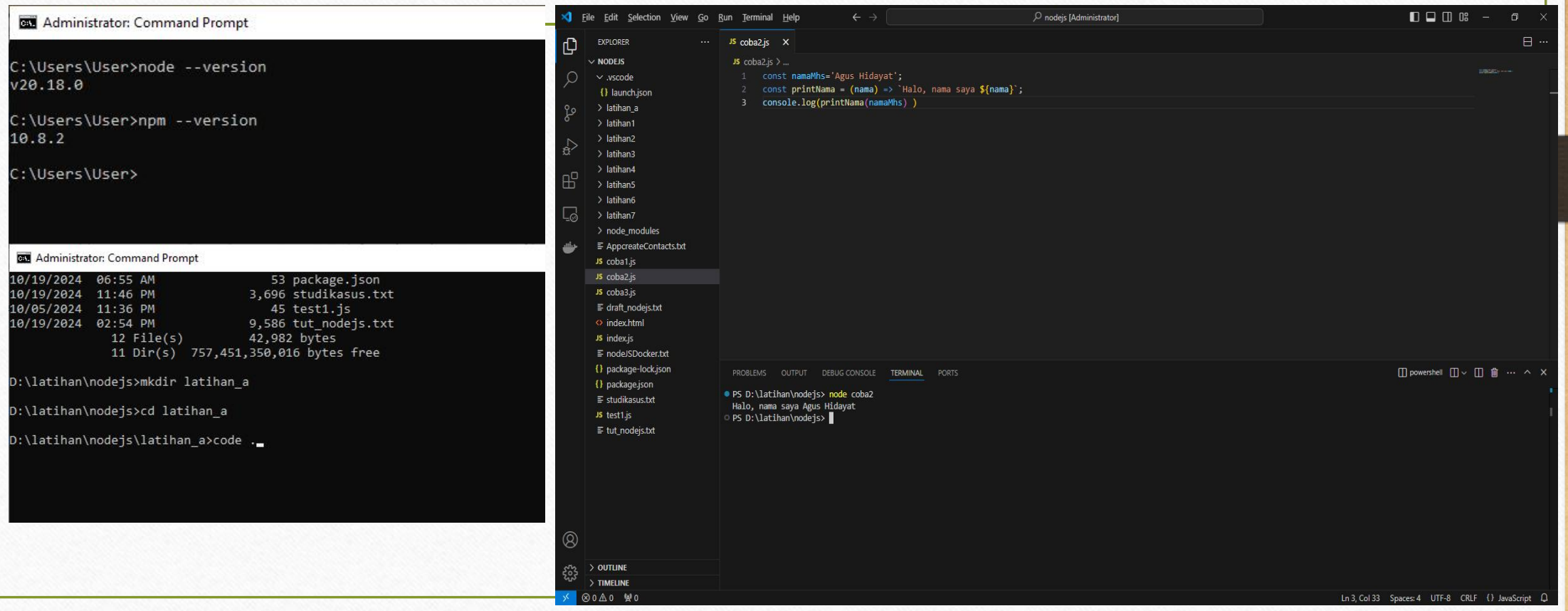
CA Command Prompt - node

```
D:\>cd belajar/webdev/nodejs
D:\belajar\webDev\nodeJS>node
Welcome to Node.js v19.6.0.
Type ".help" for more information.
> const nama='Agus'
undefined
> nama
'Agus'
> let umur=20
undefined
> umur+5
25
```

CA Command Prompt - node

```
>
> const hello=(nama,umur)=>{
...   console.log(`halo, nama saya ${nama} , umur ${umur} tahun`);
... }
undefined
> hello('Amir',27)
halo, nama saya Amir , umur 27 tahun
undefined
> _
```

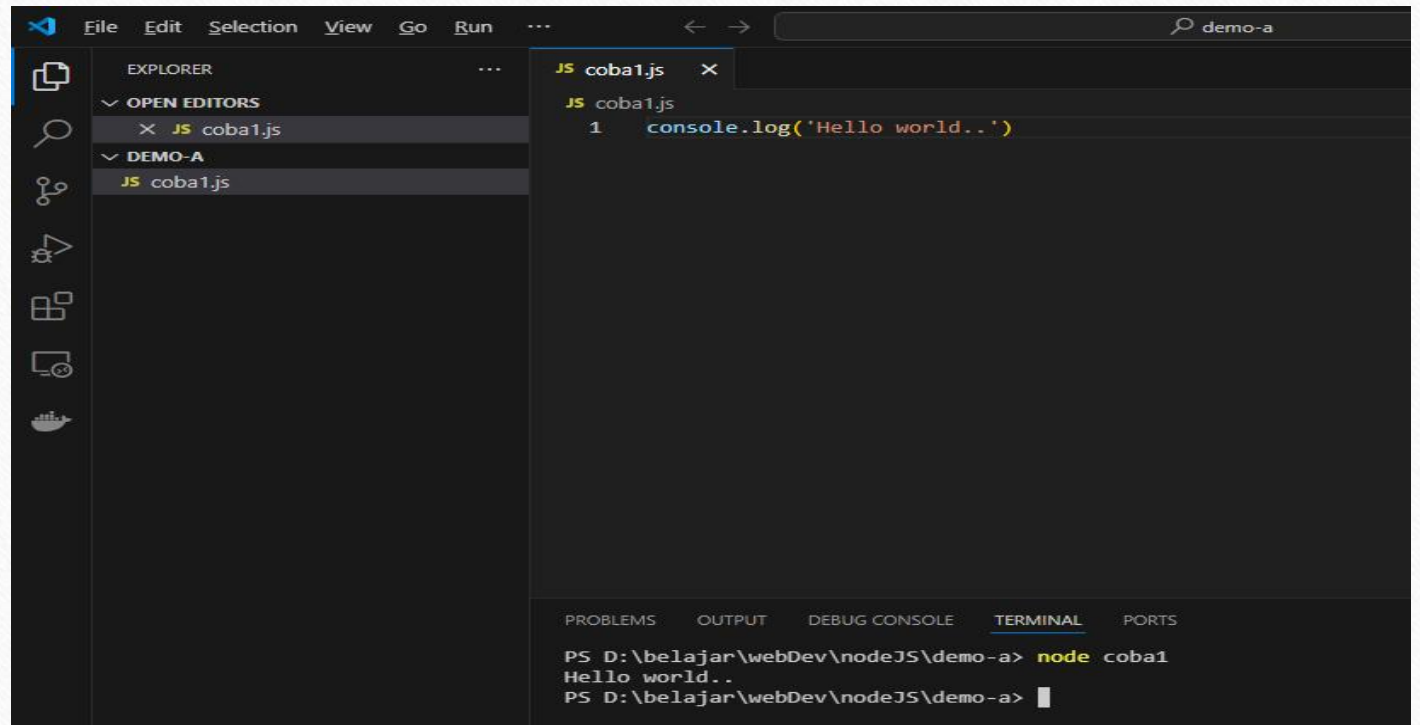
# Interface Development Environment





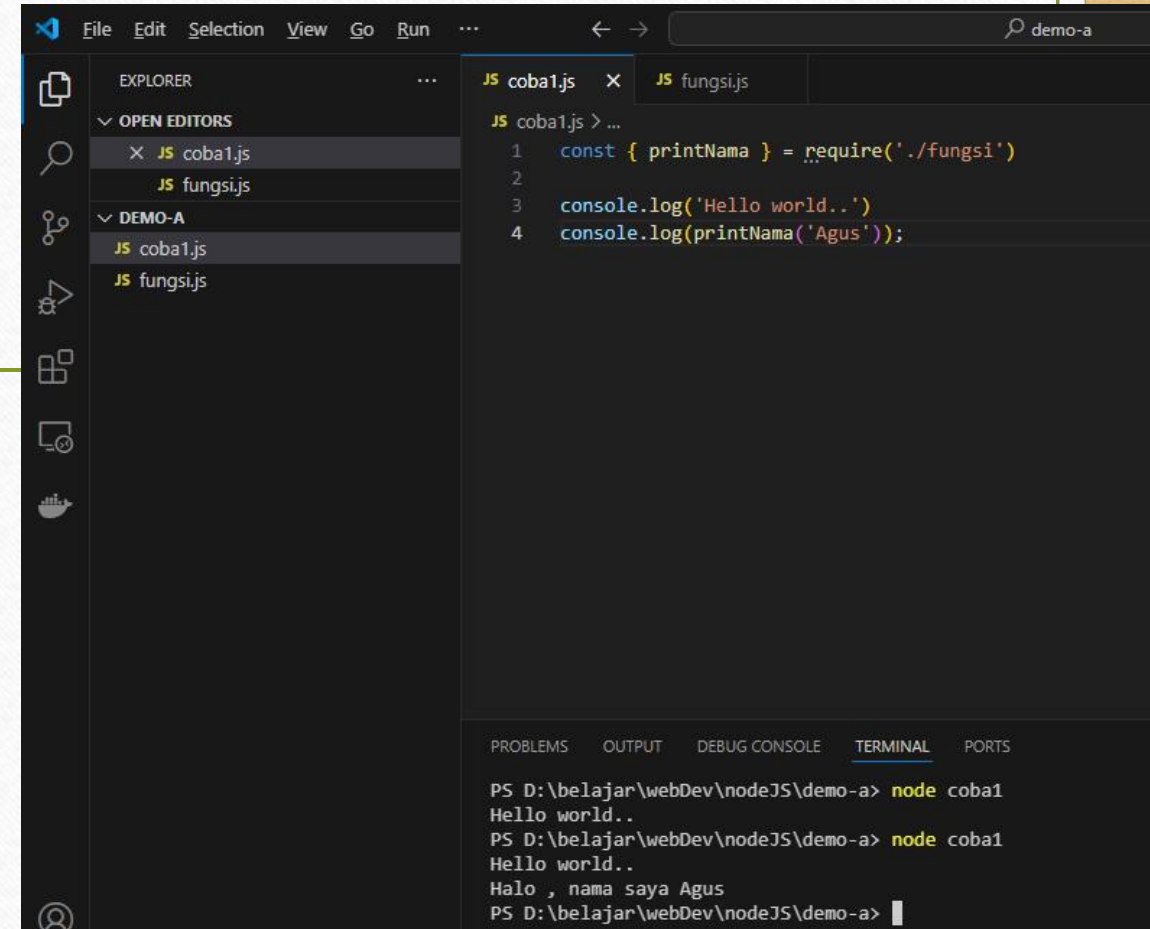
# Menjalankan file node

```
ca: Command Prompt
ar\webDev\nodeJS>mkdir demo-a
ar\webDev\nodeJS>cd demo-a
ar\webDev\nodeJS\demo-a>code .
```



# Local Module

- Module/Fungsi buatan sendiri



Visual Studio Code interface showing a local module setup. The Explorer sidebar shows a project named 'demo-a' with files 'coba1.js' and 'fungsi.js'. The Editor shows 'coba1.js' with the following code:

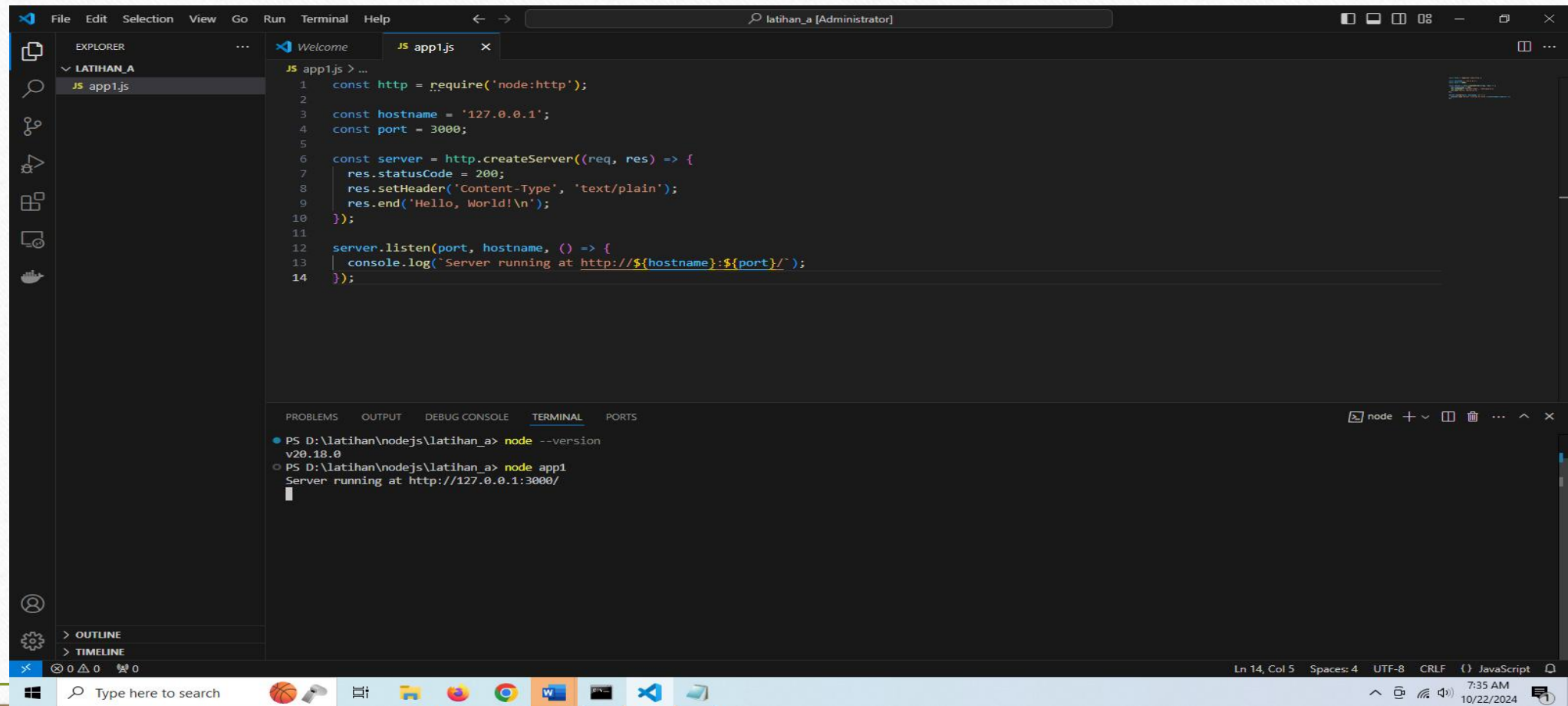
```
1 const { printNama } = require('./fungsi')
2
3 console.log('Hello world..')
4 console.log(printNama('Agus'));
```

The Terminal shows the command 'node coba1' being executed, resulting in the following output:

```
PS D:\belajar\webDev\nodeJS\demo-a> node coba1
Hello world..
PS D:\belajar\webDev\nodeJS\demo-a> node coba1
Hello world..
Halo , nama saya Agus
PS D:\belajar\webDev\nodeJS\demo-a>
```



# Membuat web server



The image shows a screenshot of the Visual Studio Code editor interface. The Explorer panel on the left shows a project named 'LATIHAN\_A' with a file 'app1.js'. The main editor area displays the code for 'app1.js', which is a simple Node.js web server. The code defines a port, a hostname, and a server that responds with 'Hello, World!' when accessed. The bottom panel shows the terminal with the command 'node --version' returning 'v20.18.0' and 'node app1' running the server, which logs 'Server running at http://127.0.0.1:3000/'.

```
File Edit Selection View Go Run Terminal Help
latihan_a [Administrator]

EXPLORER
LATIHAN_A
  JS app1.js

Welcome JS app1.js x

1  const http = require('node:http');
2
3  const hostname = '127.0.0.1';
4  const port = 3000;
5
6  const server = http.createServer((req, res) => {
7    res.statusCode = 200;
8    res.setHeader('Content-Type', 'text/plain');
9    res.end('Hello, World!\n');
10 });
11
12 server.listen(port, hostname, () => {
13   console.log(`Server running at http://${hostname}:${port}/`);
14 });

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
node + - - - - - x

PS D:\latihan\nodejs\latihan_a> node --version
v20.18.0
PS D:\latihan\nodejs\latihan_a> node app1
Server running at http://127.0.0.1:3000/

Ln 14, Col 5 Spaces: 4 UTF-8 CRLF JavaScript
```

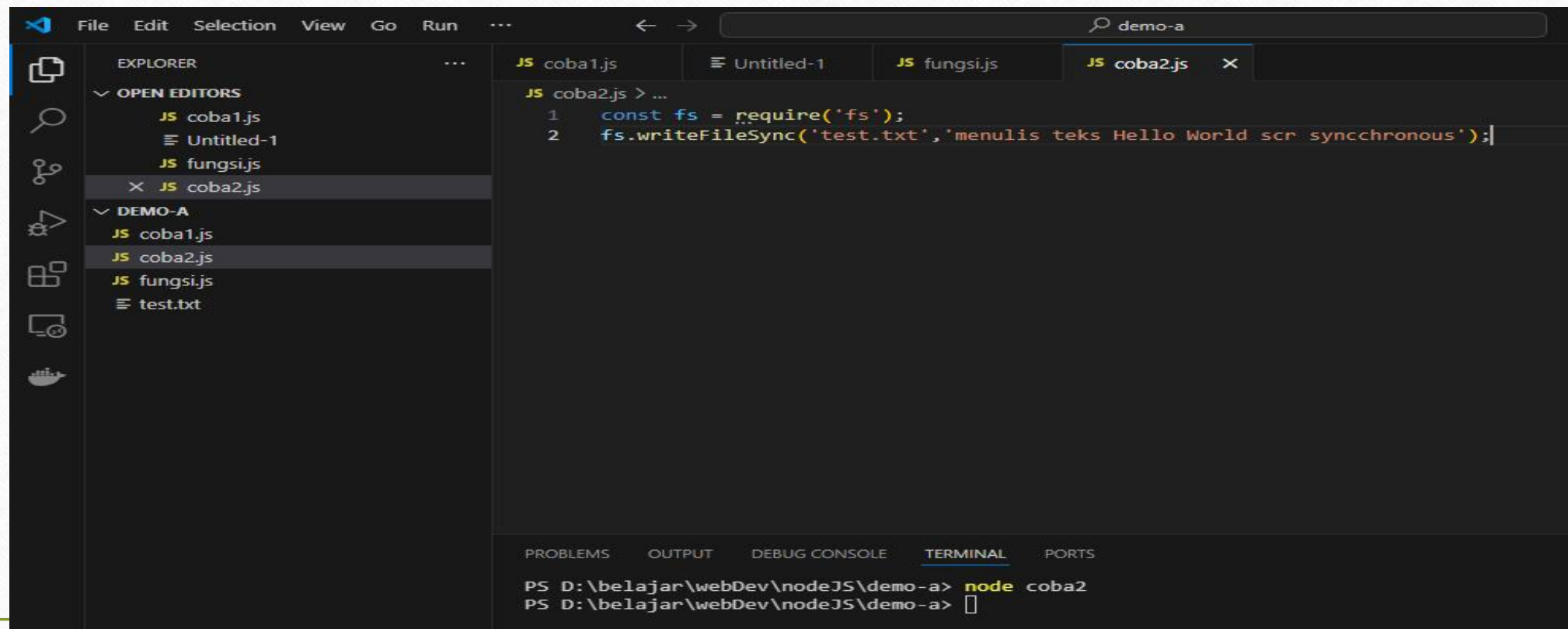
# Sistem module node Js

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- Module: sekumpulan code yang dapat digunakan kembail dengan interface yg terdefinisi
- Node Module : fungsi-fungsi dlm suatu file Javascript yg dpt digunakan kembali pada aplikasi nodejs
- Jenis Node Module :
  - Core modules
  - Local modules
  - Third party modules (npm modules)
- Contoh:
  - `const fs= require('fs');`



# Node core modules



# NPM

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- Node Package Manager: berisi library atau modul-modul yang digunakan dlm pengembangan NodeJS.
- Npm: client CLI utk install/publish paket
- Dokumentasi: [npmjs.com](https://npmjs.com)
- Contoh penggunaan NPM
  - Pada folder project:
    - `npm init`
  - ;menambahkan nodemon
    - `npm install nodemon`
    - `nodemon app`

Jika nodemon tdk jalan di vscode-cli  
1.First search and run PowerShell as administrator  
2.Get-ExecutionPolicy  
3.Set-ExecutionPolicy Unrestricted



# Install npm di folder project

```
npm
D:\belajar\webDev\nodeJS>cd demo-b
D:\belajar\webDev\nodeJS\demo-b>npm init
```

```
Command Prompt
package name: (demo-b)
version: (1.0.0)
description: belajar NPM
entry point: (index.js)
test command:
git repository:
keywords:
author: yogi
license: (ISC)
About to write to D:\belajar\webDev\nodeJS\demo-b\package.json:
{
  "name": "demo-b",
  "version": "1.0.0",
  "description": "belajar NPM",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "author": "yogi",
  "license": "ISC"
}

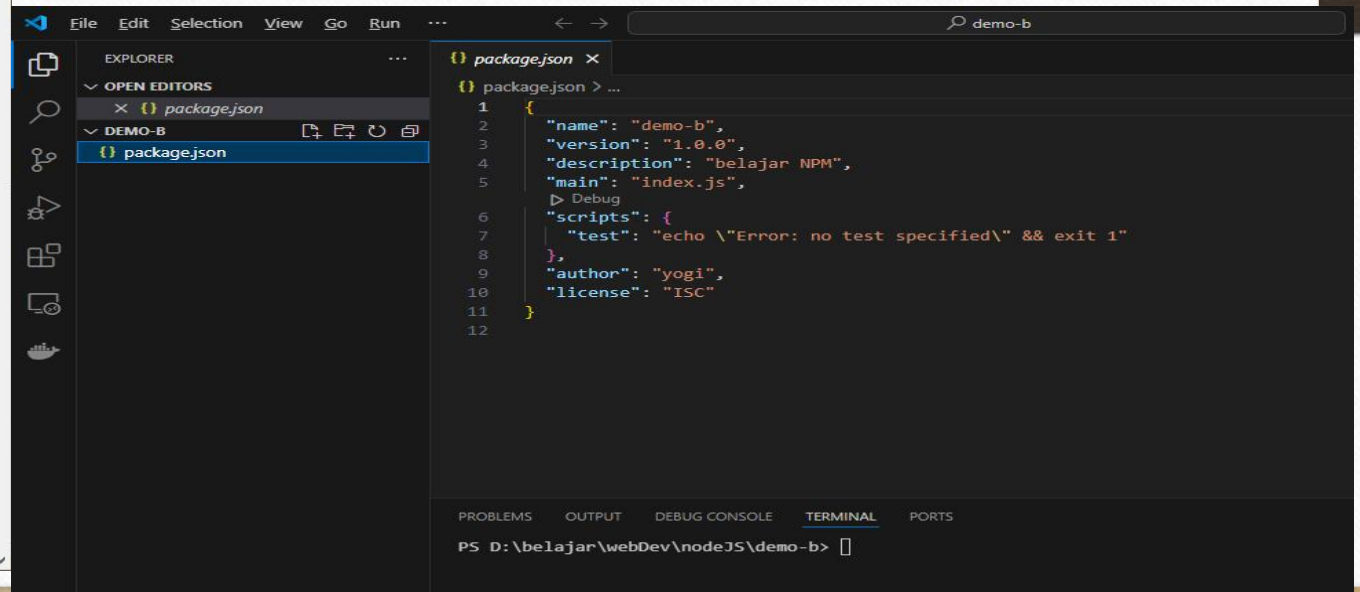
Is this OK? (yes)
D:\belajar\webDev\nodeJS\demo-b>
```

```
Command Prompt
Volume in drive D is SSD DATA
Volume Serial Number is FE8F-6E13

Directory of D:\belajar\webDev\nodeJS\demo-b

24/10/2024  10:34    <DIR>          .
24/10/2024  10:34    <DIR>          ..
24/10/2024  10:34                217 package.json
               1 File(s)                217 bytes
               2 Dir(s) 257.128.132.608 bytes free

D:\belajar\webDev\nodeJS\demo-b>code .
```



The screenshot shows the Visual Studio Code interface with the Explorer view on the left, the Open Editors view in the middle, and the package.json file open in the editor. The package.json file contains the following content:

```
1 {
2   "name": "demo-b",
3   "version": "1.0.0",
4   "description": "belajar NPM",
5   "main": "index.js",
6   "scripts": {
7     "test": "echo \"Error: no test specified\" && exit 1"
8   },
9   "author": "yogi",
10  "license": "ISC"
11 }
12
```

The terminal at the bottom shows the command prompt: PS D:\belajar\webDev\nodeJS\demo-b>.

# Express JS

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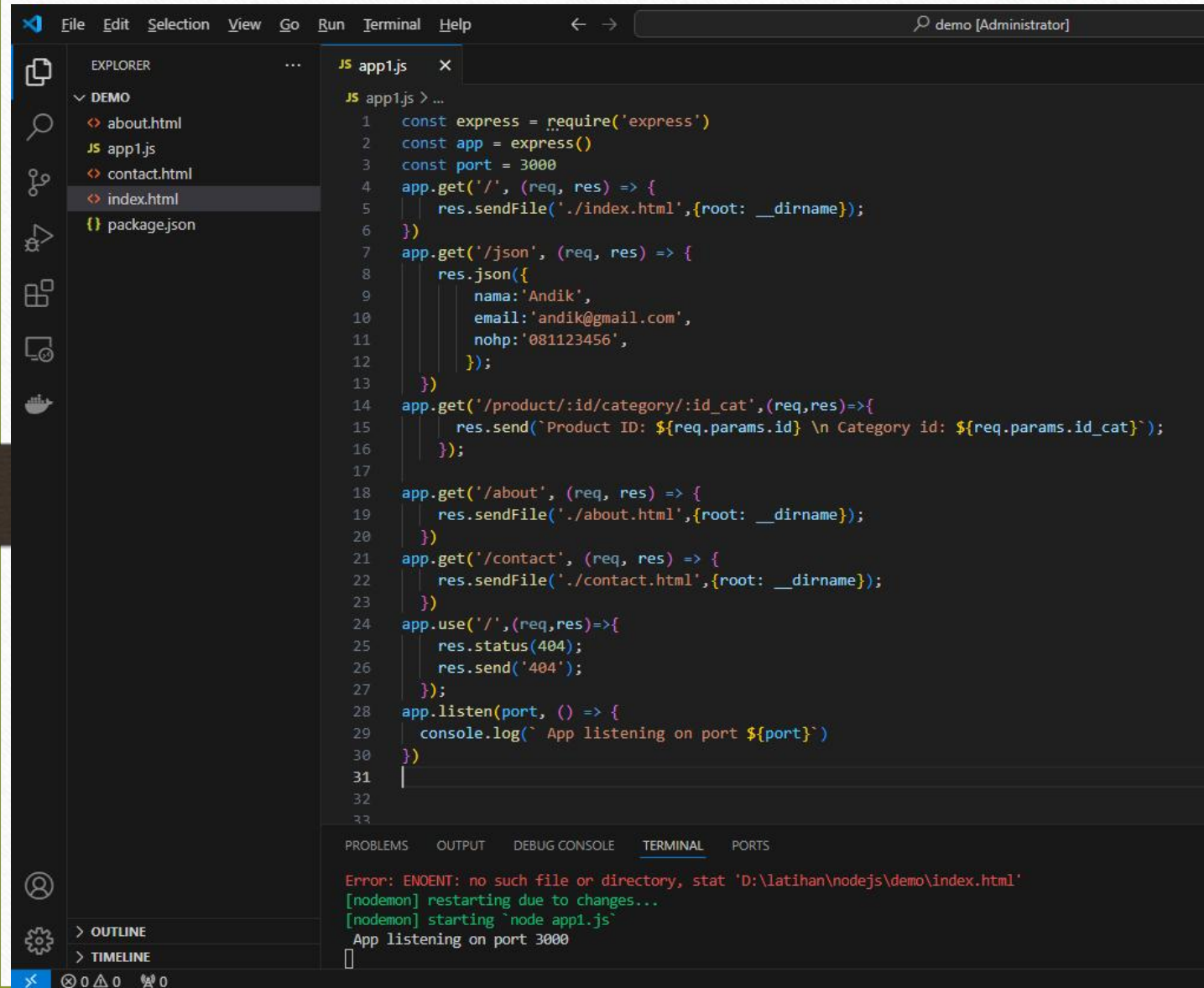
- web App Framework yg dibuat di atas NodeJS
- menyediakan interface yg minimal utk tool yg diperlukan dlm membuat app web
- membantu pengelolaan aliran data dari server ke aplikasi
- support teknologi MERN,MEAN,MEVN
- Menangani request berbagai metode http dg mudah (routes)
- MVC
- terintegrasi dg view rendering engine, utk mengelola template
- Middleware
- database:  
cassandra,couchbase,LevelDB,MySQL,MongoDB,Nwo4j,Oracle,PostgreSQL,Redis,SQLServer,SQLite,ElasticSearch



# Express JS

---

- install express
- `npm install express --save`
- ;Dokumentasi `npmjs.com` – `expressjs.com`



```
File Edit Selection View Go Run Terminal Help
demo [Administrator]

EXPLORER
DEMO
  about.html
  app1.js
  contact.html
  index.html
  package.json

JS app1.js
1  const express = require('express')
2  const app = express()
3  const port = 3000
4  app.get('/', (req, res) => {
5    res.sendFile('./index.html', {root: __dirname});
6  })
7  app.get('/json', (req, res) => {
8    res.json({
9      nama: 'Andik',
10     email: 'andik@gmail.com',
11     nohp: '081123456',
12   });
13 })
14 app.get('/product/:id/category/:id_cat', (req, res) => {
15   res.send(`Product ID: ${req.params.id} \n Category id: ${req.params.id_cat}`);
16 });
17
18 app.get('/about', (req, res) => {
19   res.sendFile('./about.html', {root: __dirname});
20 })
21 app.get('/contact', (req, res) => {
22   res.sendFile('./contact.html', {root: __dirname});
23 })
24 app.use('/', (req, res) => {
25   res.status(404);
26   res.send('404');
27 });
28 app.listen(port, () => {
29   console.log(` App listening on port ${port}`)
30 })
31
32
33

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Error: ENOENT: no such file or directory, stat 'D:\latihan\nodejs\demo\index.html'
[nodemon] restarting due to changes...
[nodemon] starting `node app1.js`
App listening on port 3000
```

Jalankan perintah pada CLI:

node app

Buka browser :

<http://localhost:3000>

<http://localhost:3000/about>

<http://localhost:3000/json>

<http://localhost:3000/product/1/category/>



# Latihan1

## static web app

- File index.html, about.html, contact.html

```
Run Terminal Help demo [Administrator]
JS app1.js index.html x
index.html > html
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <meta name="viewport" content="width=device-width, initial-scale=1.0">
6   <title>Halaman HTML</title>
7 </head>
8 <body>
9   <h1>Ini halaman Home HTML</h1>
10  <ul>
11    <li><a href="/">Home</a></li>
12    <li><a href="/about">About</a></li>
13    <li><a href="/contact">Contact</a></li>
14  </ul>
15
16
17 </body>
18 </html>
```

```
Run Terminal Help demo [Administrator]
JS app1.js contact.html x
contact.html > ...
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <meta name="viewport" content="width=device-width, initial-scale=1.0">
6   <title>Halaman HTML</title>
7 </head>
8 <body>
9   <h1>Ini halaman About </h1>
10  <ul>
11    <li><a href="/">Home</a></li>
12    <li><a href="/about">About</a></li>
13    <li><a href="/contact">Contact</a></li>
14  </ul>
15
16
17 </body>
18 </html>
```

```
Run Terminal Help demo [Administrator]
JS app1.js about.html x
about.html > html
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <meta name="viewport" content="width=device-width, initial-scale=1.0">
6   <title>Halaman HTML</title>
7 </head>
8 <body>
9   <h1>Ini halaman About </h1>
10  <ul>
11    <li><a href="/">Home</a></li>
12    <li><a href="/about">About</a></li>
13    <li><a href="/contact">Contact</a></li>
14  </ul>
15
16
17 </body>
18 </html>
```



# EJS (Embedded Javascript Templates)

---

- simple ,speed,easy debug,active,pembuatnya sm dg express
- npm install ejs
- app.set('view engine','ejs')
- res.render('index')
- ;;extensi file hrs index.ejs

# express-ejs-layouts

---

- `npm install express-ejs-layouts@2.5.0`
- `ejsfor`
- `const expressLayouts = require('express-ejs-layouts')`
- `app.use(expressLayouts);`

# middleware

---

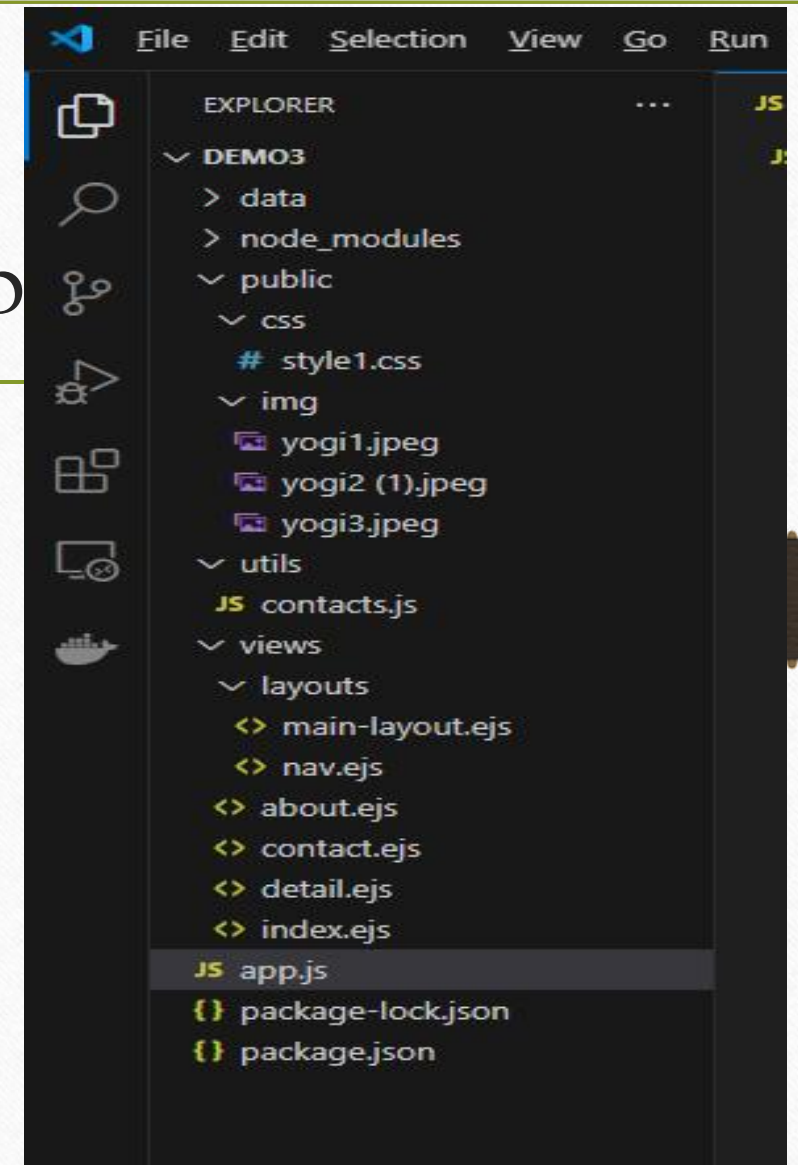
- `;;express.static`
- `//built in middleware`
- `app.use(express.static('public')); //bikin /public`



# Latihan 2

## dynamic web app

- Struktur project
- Source code ada di file latihan1\_nodejs.pdf



# Run Program

---

- Buat folder project dan masuk ke folder tsb:
- Pada commandline ketikkan:
- `npm install -g nodemon`
- `npm install express --save`
- `npm install ejs`
- `npm install express-ejs-layouts`

File Edit View History Bookmarks Tools Help



Halaman home



avatar icon free - Penelusuran



Man avatar - Free people icons



localhost:3000



Search



App Contact Home About Contact Disabled



Amir

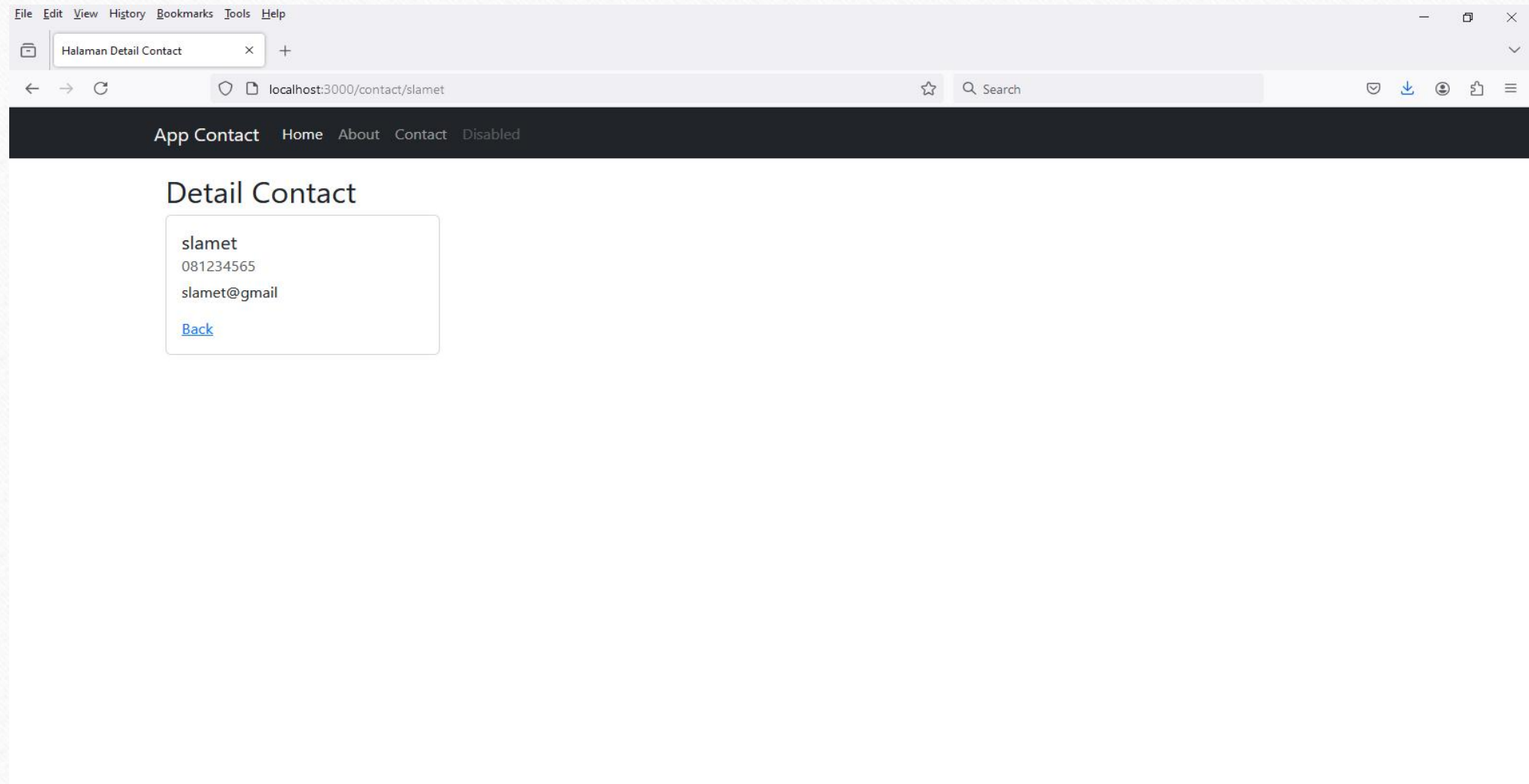
Dosen & Software Developer





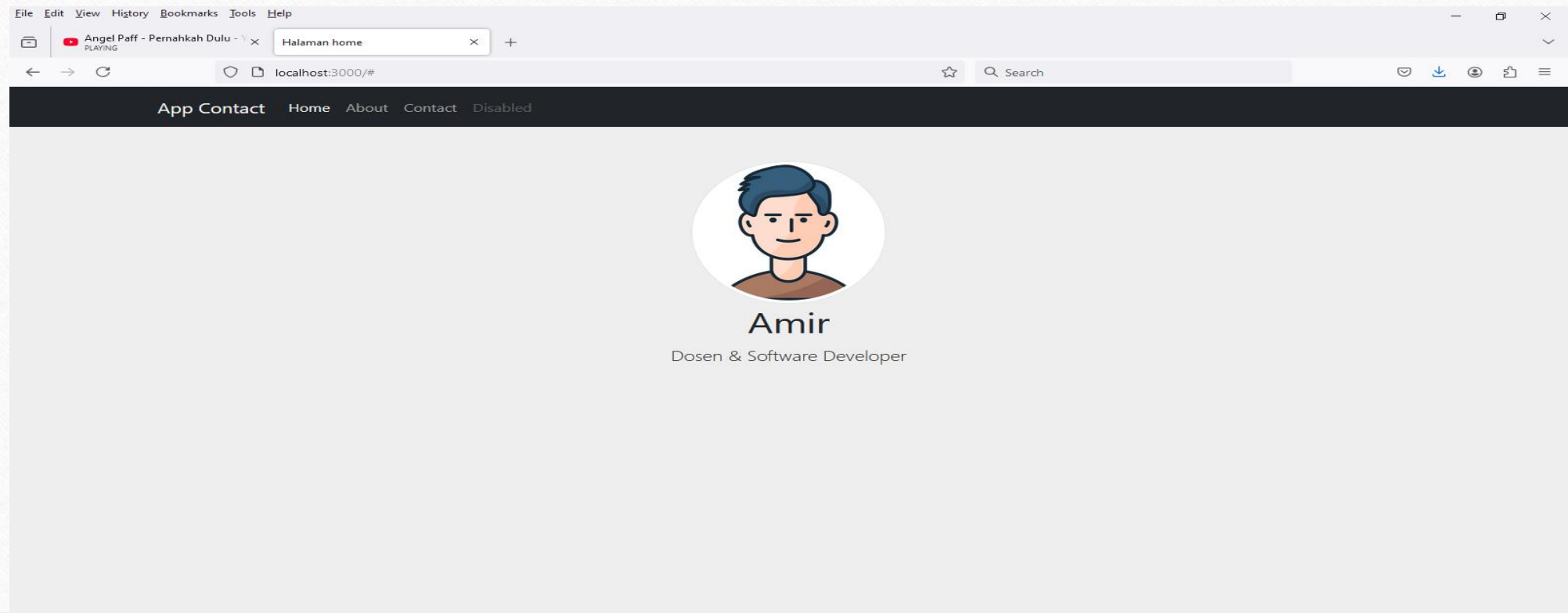
## Daftar Contact

#	Nama	Telp	Aksi
1	slamet	081234565	<a href="#">Detail</a>
2	agus suwanda	081234567	<a href="#">Detail</a>



# Latihan 3

## CRUD web app







## Daftar Contact

[Tambah Data](#)

#	Nama	Telp	Aksi
1	slamet Wegiman	08123456555	<a href="#">Detail</a>
2	Kromo Martodirejo Prawiro	08123456666	<a href="#">Detail</a>
3	Karno Saputro Legowo	0812349999	<a href="#">Detail</a>
4	Andi Prawiro Direjo	081223344	<a href="#">Detail</a>



## Form Tambah data Contact

Nama Contact

Nomor HP

Email address

Tambah Data

File Edit View History Bookmarks Tools Help

Angel Paff - Pernahkah Dulu - Y x Halaman Detail Contact x +

localhost:3000/contact/slamet Wegiman

Search

Download

App Contact Home About Contact Disabled

## Detail Contact

slamet Wegiman  
08123456555  
slamet@gmail.com

Delete Edit

[Back](#)



