

네트워크 프로그래밍

웹(Node.js) 기반의 소켓통신프로그래밍

- 2018-11-13
- 김 태 완



Node.js?

<https://ko.wikipedia.org/wiki/Node.js>



- 구글 크롬의 V8 Engine JavaScript 엔진
- JavaScript Runtime
- 확장성 있는 네트워크 어플리케이션
- Server-Side 플랫폼
- 뛰어난 확장성(Node)
- 가볍고, 효율적
- 라이선스 (MIT)
- 멀티 플랫폼
(Windows, Linux, MacOS , etc)

<https://nodejs.org/ko/>

<https://velopert.com/node-js-tutorials>

Node.js?

<https://ko.wikipedia.org/wiki/Node.js>



- Speed (run on google JS Engine)
- Asynchronous I/O
- Non-Blocking I/O
- Data Streaming
(HTTP request / response as a single event)
- Real-Time Application
(client / server side)
- Easy / Fast 코딩
- Open-Source (NPM)

<https://nodejs.org/ko/>

<https://velopert.com/node-js-tutorials>

Node.js?

<https://ko.wikipedia.org/wiki/Node.js>



+

Walmart*

ebay™

PayPal®

DOW JONES

intuit.

NETFLIX

LinkedIn

The New York Times

Microsoft

UBER

YAHOO!

Kingfisher

<https://nodejs.org/ko/>

<https://velopert.com/node-js-tutorials>



Node.js?

<https://ko.wikipedia.org/wiki/Node.js>

The image is a screenshot of a PayPal advertisement for a Business Debit MasterCard. The background is a dark, textured surface, possibly a laptop or a book. On the right side, there is a close-up of the PayPal Business Debit MasterCard, which is silver and black, resting on a dark wallet. The card displays the PayPal logo, the MasterCard logo, and the card number 5412 7500 0000. The cardholder's name, JOHN DOE, and the expiration date, 06/18, are also visible.

PayPal Personal - Business - Send - Request Log In Sign Up

PayPal Business Debit MasterCard®

- Withdraw money from your PayPal balance at any ATM.
- No annual fee.
- Earn unlimited 1% cash back on eligible purchases.[†]
- MasterCard Zero Liability policy for unauthorized purchases.*

[Get a Card Today](#)

[†] Additional enrollment for Cash Back is required. Earn Cash Back when you use your card online, over the phone or sign up for a purchase. Cash Back will be earned on net purchases when the receipt is signed or when the purchase is authorized as a credit transaction by phone or online. Purchases made using a PIN are not eligible to earn Cash Back.

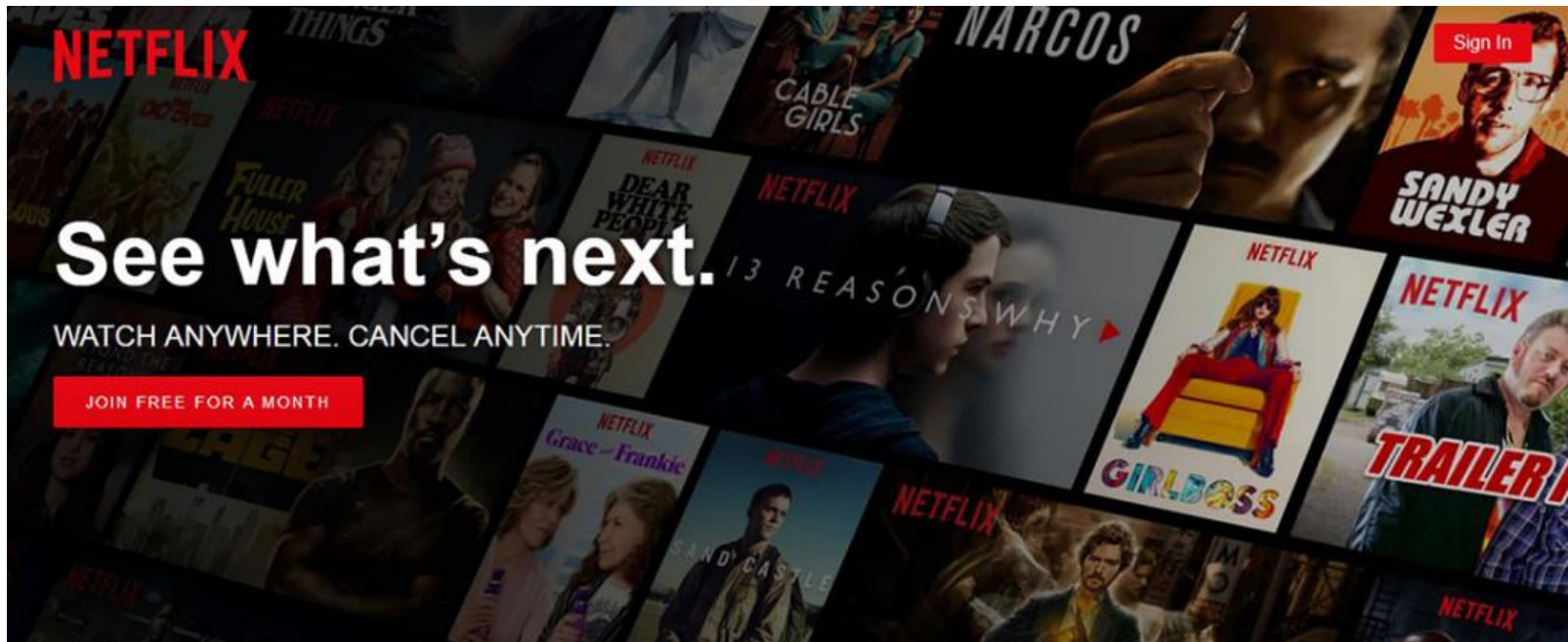
* Conditions and exceptions apply, see **Cardholder Agreement**.

<https://nodejs.org/ko/>



Node.js?

<https://ko.wikipedia.org/wiki/Node.js>



<https://nodejs.org/ko/>



Node.js?

<https://ko.wikipedia.org/wiki/Node.js>

Uber

드라이버 파트너

라이더

비즈니스

더 보기

로그인

가입

원하는 대로 이동하세요.

드라이버 파트너

원하는 시간에 자유롭게 운행하세요.
Uber 앱이 주변의 운행 기회를 찾아 드립니다.
[자세히 알아보기](#)

드라이버 파트너로 가입하기 →

라이더

버튼 하나로 원하는 곳까지 간편하게 이동하세요.
[자세히 알아보기](#)

라이더로 가입하기 →

<https://nodejs.org/ko/>

2018-11-11

7



Node.js?

<https://ko.wikipedia.org/wiki/Node.js>

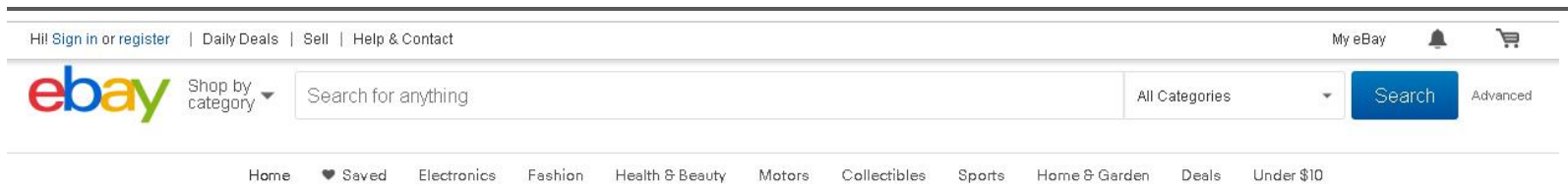
A screenshot of the LinkedIn homepage with a sign-up form overlay. The form is titled "최고의 분야 전문가되기" (Become the best expert in your field) and "LinkedIn에서 가능합니다. 무료로 가입하세요." (Possible on LinkedIn. Join for free). It contains fields for "성" (Last name), "이름" (First name), "이메일 주소" (Email address), and "비밀번호(6자 이상)" (Password, 6 characters or more). Below the fields is a disclaimer: "회원 가입을 클릭하면 LinkedIn 이용약관, 개인정보 취급 방침, 쿠키정책에 동의하는 것으로 간주됩니다." (By clicking to join, you agree to the LinkedIn Terms of Use, Privacy Policy, and Cookie Policy). A blue button labeled "회원 가입" (Join) is at the bottom of the form. The background shows a grid of diverse people's faces. At the top of the page, there are input fields for "이메일 주소" (Email address) and "비밀번호" (Password), a "로그인" (Login) button, and a link "비밀번호를 잊으셨나요?" (Forgot your password?). At the bottom of the page, there is a search bar with "동료 찾기" (Find colleagues) and "성" (Last name) and "이름" (First name) input fields, a "검색" (Search) button, and a footer with "LinkedIn 회원 목록: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 더 보기" (LinkedIn member list: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z More) and "국가/지역으로 찾기" (Find by country/region).

<https://nodejs.org/ko/>



Node.js?

<https://ko.wikipedia.org/wiki/Node.js>



Explore popular categories



Under \$10



Health & Beauty



Parts and
Accessories



Sneakers



Smartphones &
Accessories



Watches



Electronics

<https://nodejs.org/ko/>



Node.js?

<https://ko.wikipedia.org/wiki/Node.js>

The image shows a Walmart Pay advertisement. At the top, there's a navigation bar with a Walmart logo, a search bar, and icons for a shopping cart, user profile, location, and a shopping bag. Below this, the text "Walmart Pay" is centered. The main part of the image is a large advertisement. On the left, a person's hand holds a smartphone displaying the Walmart Pay app interface, which shows a QR code and the text "Start Scanning". The background of the ad is a blue gradient. On the right, the text "Walmart Pay" is followed by "Pay like a pro". Below this, a paragraph reads: "Shop without a wallet & check out faster in stores. With Walmart Pay, you can securely store your credit, debit or gift card on your phone & easily redeem your Savings Catcher rewards." At the bottom right, the Walmart Pay logo is displayed.

<https://nodejs.org/ko/>



Node.js?

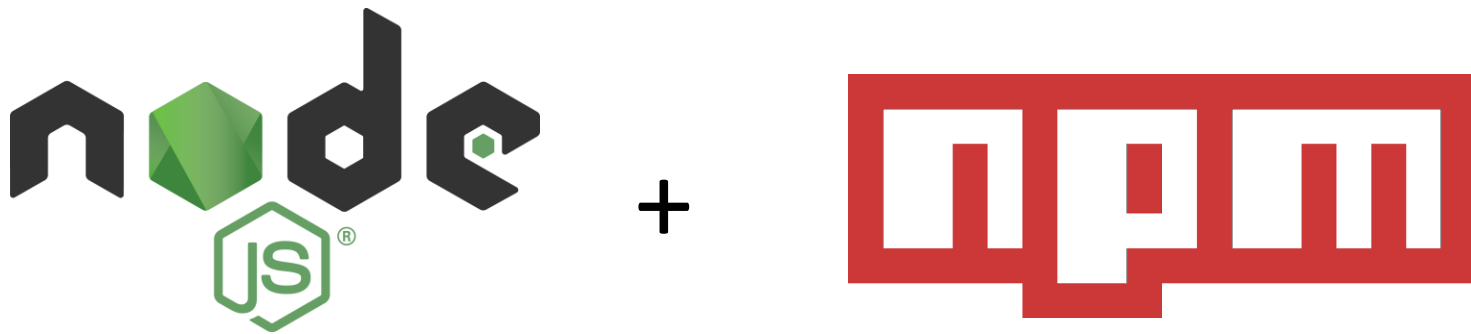
<https://ko.wikipedia.org/wiki/Node.js>

The image shows a Walmart Pay advertisement. At the top, there's a navigation bar with the Walmart logo, a search bar, and icons for a shopping cart, user profile, location, and a shopping cart. Below this, the text "Walmart Pay" is centered. The main part of the image is a photograph of a person's hand holding a smartphone, scanning a QR code on a Walmart Pay sign. The sign also displays "Start Scanning" and a search bar. To the right of the photograph is a blue text box with the heading "Walmart Pay" and "Pay like a pro". Below this, it says: "Shop without a wallet & check out faster in stores. With Walmart Pay, you can securely store your credit, debit or gift card on your phone & easily redeem your Savings Catcher rewards." At the bottom right of the blue box is the Walmart Pay logo.

<https://nodejs.org/ko/>

Node.js Open Source Library

<https://www.npmjs.com/>



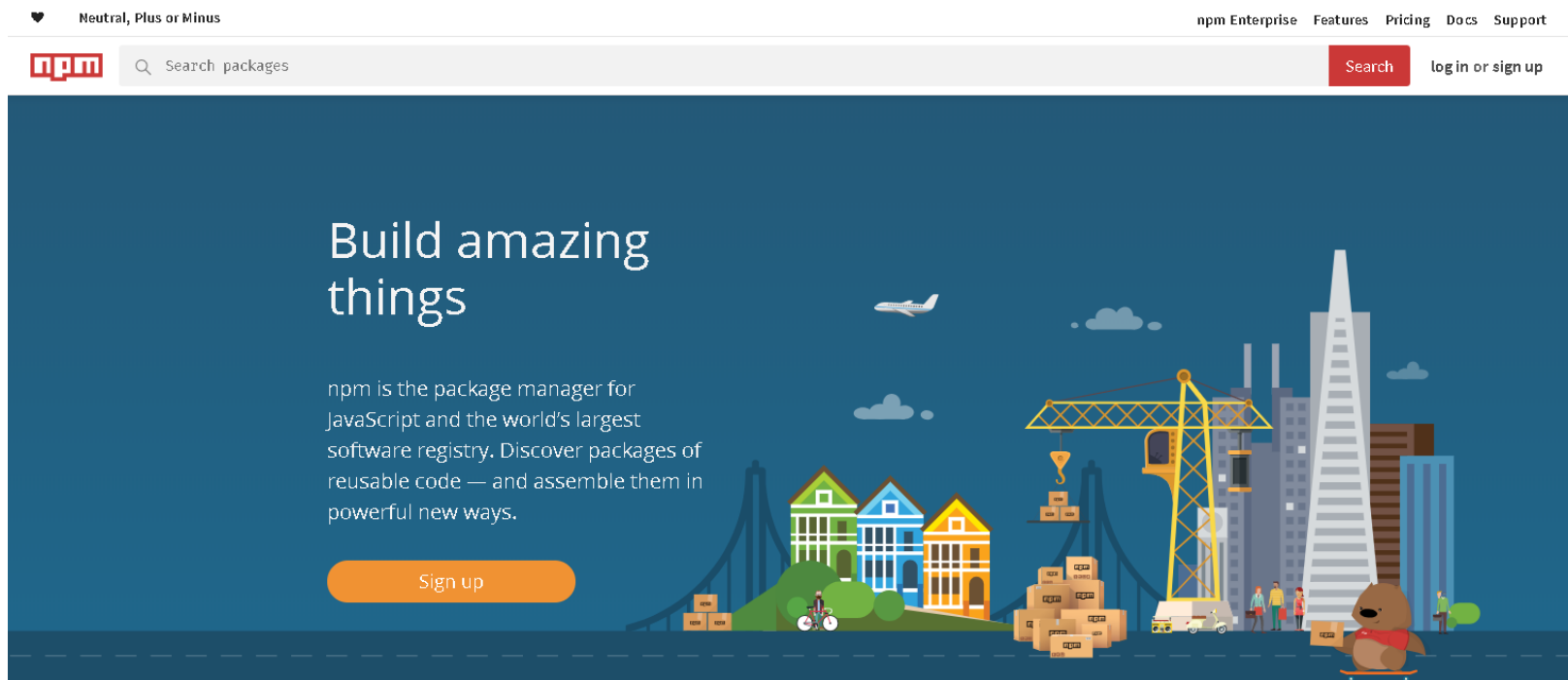
Open Source Library?

<https://nodejs.org/ko/>



Node.js Open Source Library

<https://www.npmjs.com/>



<https://nodejs.org/ko/>



♥ Nifty Pun Master

npm Enterprise Features Pricing Docs Support



socket

Search

log in or sign up

4655 packages found

1 2 3 ... 233 »

Sort Packages

Optimal

Popularity

Quality

Maintenance

Who's Hiring?

Triplebyte, MuleSoft, Callisto and lots of other companies are hiring javascript developers.

See all 19 companies

socket

Socket is a connect clone for simple socket based applications

 mountainmansoftware published 0.0.1 • 6 years ago

p
q
m

socket.io

Node.js realtime framework server

realtime framework websocket tcp events socket io

 darrachequesne published 2.1.1 • 6 months ago

p
q
m

WS

Simple to use, blazing fast and thoroughly tested websocket client and server for Node.js

HyBi Push RFC-6455 WebSocket WebSockets real-time

 lpinca published 6.1.0 • a month ago

p
q
m

socket.io-client

[[Build Status](https://secure.travis-ci.org/socketio/socket.io-client.svg?branch=master)](http://travis-ci.org/socketio/socket.io-client) [[Dependency Status](https://david-dm.org/socketio/socket.io-client.svg)](https://david-dm.org/socketio/socket.io-

realtime framework websocket tcp events client

 darrachequesne published 2.1.1 • 6 months ago

p
q
m

sockjs-client

SockJS-client is a browser JavaScript library that provides a WebSocket-like object.

p
q
m



Search packages

Search

log in or sign up

Share your code. npm Orgs help your team discover, share, and reuse code. [Create a free org »](#)

ws

6.1.0 • [Public](#) • Published a month ago

[Readme](#)

[1 Dependencies](#)

[4,450 Dependents](#)

[99 Versions](#)

ws: a Node.js WebSocket library

npm v6.1.0 build passing build passing coverage 100%

ws is a simple to use, blazing fast, and thoroughly tested WebSocket client and server implementation.

Passes the quite extensive Autobahn test suite: [server](#), [client](#).

Note: This module does not work in the browser. The client in the docs is a reference to a backend with the role of a client in the WebSocket communication. Browser clients must use the native [WebSocket](#) object. To make the same code work seamlessly on Node.js and the browser, you can use one of the many wrappers available on npm, like [isomorphic-ws](#).

Table of Contents

- [Protocol support](#)
- [Installing](#)
 - [Opt-in for performance and spec compliance](#)
- [API docs](#)

Install

```
> npm i ws
```

± weekly downloads

444,351



version

6.1.0

license

MIT

open issues

13

pull requests

1

homepage

[github.com](#)

repository

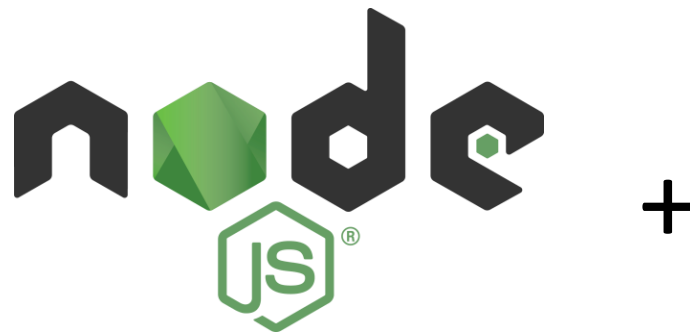
[github](#)

last publish

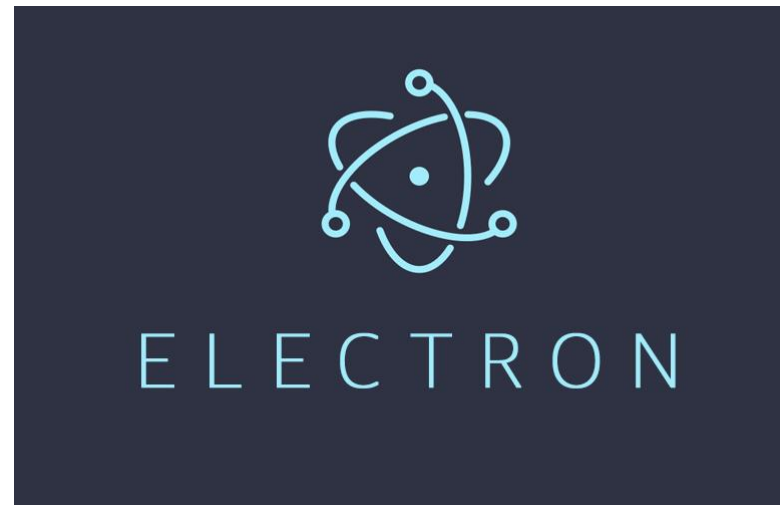
a month ago

collaborators

Node.js?



+



Desktop Application?

<https://electronjs.org/>

<https://nodejs.org/ko/>



ELECTRON

Node.js + Electron



Skype



GitHub Desktop



Figma



Flow



Discord



WordPress.com



Beaker Browser



Hyper



Kap



Now Desktop



Visual Studio Code



Kitematic



Insomnia



Sygus



Simplenote



Collectie



Caret



JIBO



GitKraken



Ghost



WebTorrent



1Clipboard



Slack



Atom

<https://github.com/electron/electron>


2018-1




ELECTRON

Node.js + Electron

<https://electronjs.org/apps>

 ELECTRON

후원자 연 문서 블로그 커뮤니티 출시 검색  한국어

카테고리들

Productivity 198

Developer Tools 139

Utilities 108

Music 44

Social Networking 40

Photo & Video 40

Games 29

Finance 23

Business 20

Education 16

Graphics & Design 11

Entertainment 6

Books 5


News 4


Lifestyle 4


Medical 2


Travel 1


Health & Fitness 1


 **Dusk Player** Minimal music player for your desktop.


 **RIDE** Remote IDE for Dyalog APL.


 **Superscript** A text editor for comic book writers


 **P3X Redis UI** Redis UI based on redis-commander and phpRedisAdmin.


 **EasyHand** Helpful tool of making easier to work with huge quantity of files, folders and IDEs in the same...


 **Tagstoo** Software to tag folders and files, with multimedia and ebooks preview.


 **MoviePrint** With MoviePrint you can create screenshots of entire movies in an instant.

 **Altair GraphQL Client** Beautiful feature-rich GraphQL Client for all platforms

 **Raven Reader** Simple RSS Reader for desktop without any distraction.

 **Genotify** Light-weight, cross-species gene lookup and summarization for desktop.

 **tiny-timer** Simple timer desktop app.

 **Excel Parser Processor** A Cross-Platform Desktop App for processing all rows of excel files

<https://electronjs.org>
<https://nodejs.org>

2018-11-11



Node.js 준비물

1. Node.js 설치하기

<https://nodejs.org/ko/>



Node.js®는 Chrome V8 JavaScript 엔진으로 빌드된 JavaScript 런타임입니다.

다운로드 - Windows (x64)

10.13.0 LTS

안정적, 신뢰도 높음

[다른 운영 체제](#) | [변경사항](#) | [API 문서](#)

11.1.0 현재 버전

최신 기능

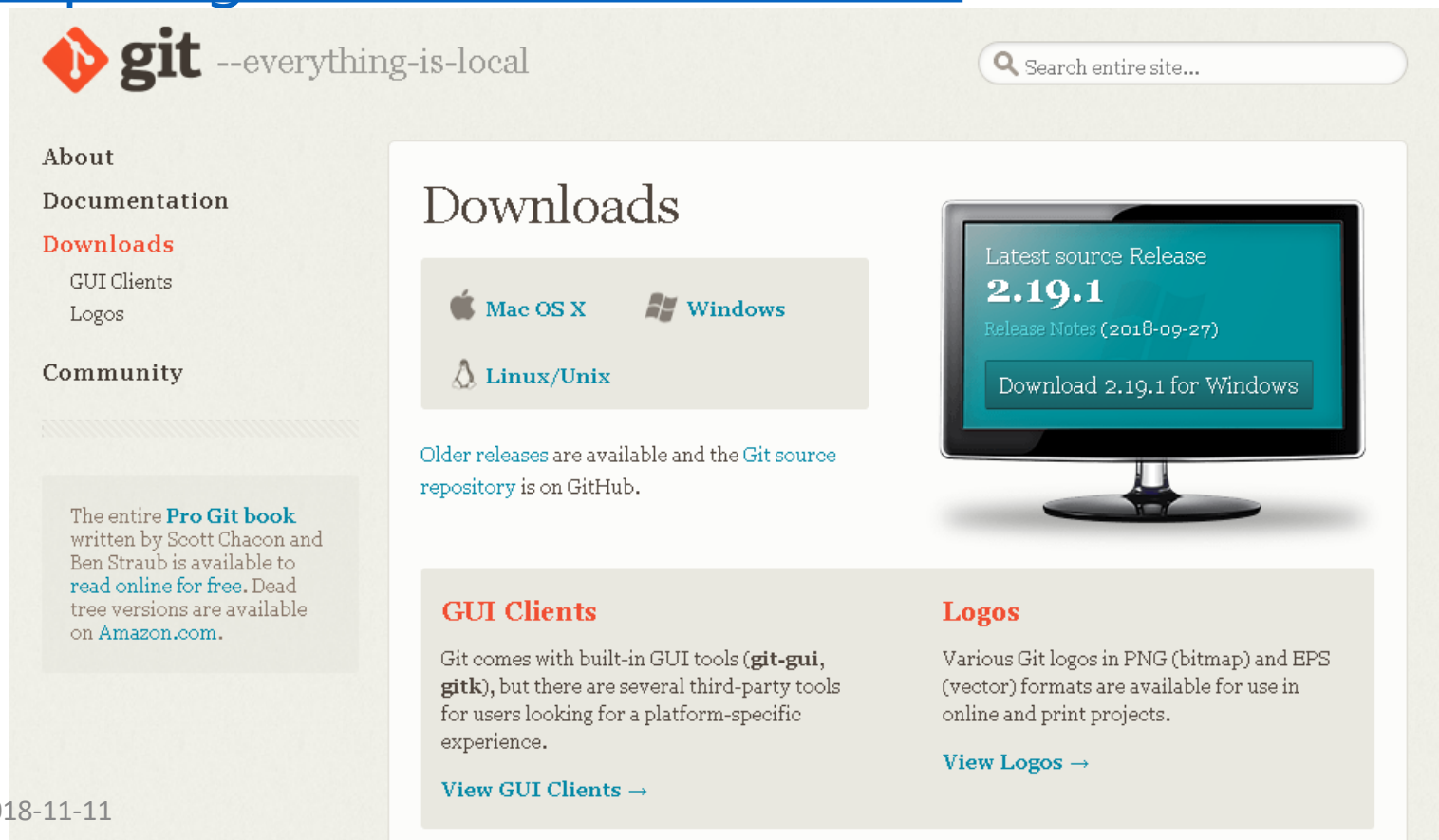
[다른 운영 체제](#) | [변경사항](#) | [API 문서](#)

LTS 일정은 [여기서](#) 확인하세요.

Node.js 준비물

2. git 설치하기

<https://git-scm.com/downloads>



The screenshot shows the Git website's 'Downloads' page. The header features the Git logo and the tagline '--everything-is-local', along with a search bar. The left sidebar contains links for 'About', 'Documentation', 'Downloads' (highlighted), 'GUI Clients', 'Logos', and 'Community'. The main content area is titled 'Downloads' and includes a section for platform-specific downloads with icons for Mac OS X, Windows, and Linux/Unix. To the right, a monitor graphic displays the 'Latest source Release 2.19.1' with a 'Download 2.19.1 for Windows' button. Below the platform links, a note states that older releases and the Git source repository are available on GitHub. At the bottom, there are sections for 'GUI Clients' and 'Logos', each with a brief description and a link to view more options.

git --everything-is-local

Search entire site...

About
Documentation
Downloads
GUI Clients
Logos
Community

The entire **Pro Git book** written by Scott Chacon and Ben Straub is available to [read online for free](#). Dead tree versions are available on [Amazon.com](#).

Downloads

Mac OS X Windows
Linux/Unix

Older releases are available and the Git source repository is on GitHub.

Latest source Release
2.19.1
Release Notes (2018-09-27)
Download 2.19.1 for Windows

GUI Clients

Git comes with built-in GUI tools (**git-gui**, **gitk**), but there are several third-party tools for users looking for a platform-specific experience.
[View GUI Clients →](#)

Logos

Various Git logos in PNG (bitmap) and EPS (vector) formats are available for use in online and print projects.
[View Logos →](#)



Node.js 준비물

3. Visual Studio Code 설치하기

<https://code.visualstudio.com/>

The image shows the Visual Studio Code website header and a screenshot of the VS Code application. The website header includes the Visual Studio Code logo, navigation links (Docs, Updates, Blog, Community, Extensions, FAQ), a search bar, and a download button. Below the header, a banner announces 'Version 1.28 is now available!'. The main content area features the text 'Code editing. Redefined.' and 'Free. Open source. Runs everywhere.' with a 'Download for Windows' button. The screenshot of the VS Code application shows the 'EXTENSIONS' sidebar with a list of popular extensions like C#, Python, and C/C++. The main editor area displays a TypeScript file named 'app.ts' with code for a web server using Express and TypeScript. The status bar at the bottom shows 'Ln 9, Col 21' and 'UTF-8'.

Visual Studio Code Docs Updates Blog Community Extensions FAQ

Search Docs Download

Version 1.28 is now available! Read about the new features and fixes from September.

Code editing.
Redefined.

Free. Open source. Runs everywhere.

Download for Windows
Stable Build

Other platforms and Insiders Edition

By using VS Code, you agree to its
license and privacy statement.

2018-11-11

File Edit View Goto Help

EXTENSIONS

@popular

- C# 1.22 356K ★★★★★
C# for Visual Studio Code (p...
Microsoft Install
- Python 0.12.1 211K ★★★★★
Linting, Debugging (multi-L...
Don Jayamanne Install
- Debugger for Chrome 1.48
Debug your JavaScript code...
Microsoft JS Diagno... Install
- C/C++ 0.7.1 143K ★★★★★
Complete C/C++ language ...
Microsoft Install
- Go 0.6.39 99K ★★★★★
Rich Go language support f...
lukehoban Install
- ESLint 0.10.1 88K ★★★★★
Integrates ESLint into VS Co...
Dirk Baeumer Install

app.ts

```
1 import app from './app';
2 import debugModule = require('debug');
3 import http = require('http');
4
5 const debug = debugModule('node-express-typescript:server');
6
7 // Get port from environment and store in Express.
8 const port = normalizePort(process.env.PORT || '3000');
9 app.set('port', port);
10
11 // create
12 const server = export
13 server.listen
14 server.on
15 server.on
16
17 /**
18 * Normal
19 */
20 function normalizePort(val: any): number|string|boolean {
21   let port = parseInt(val, 10);
22 }
```

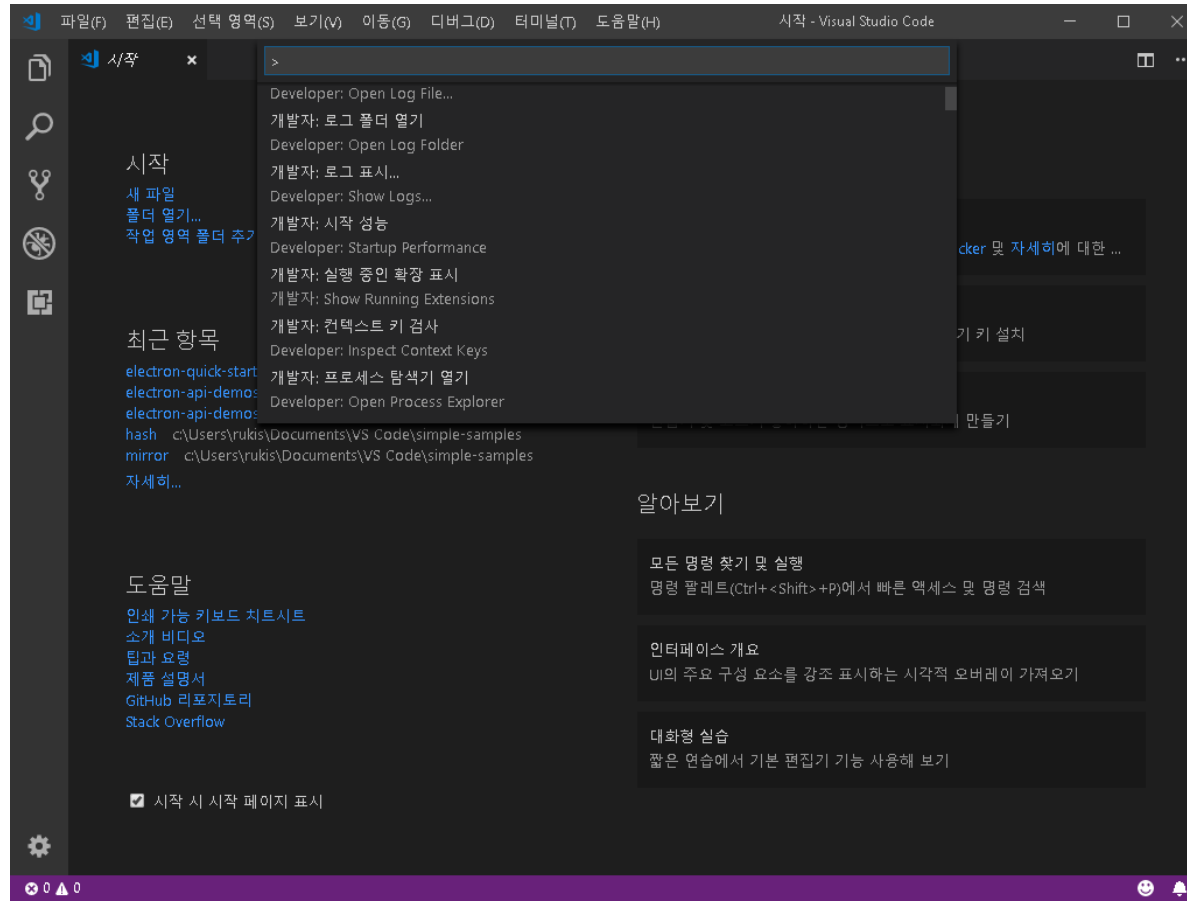
Ln 9, Col 21 Spaces: 2 UTF-8 LF



Node.js 시작하기

Visual Studio Code

➤ Ctrl + Shift + p / F1 (명령팔레트)

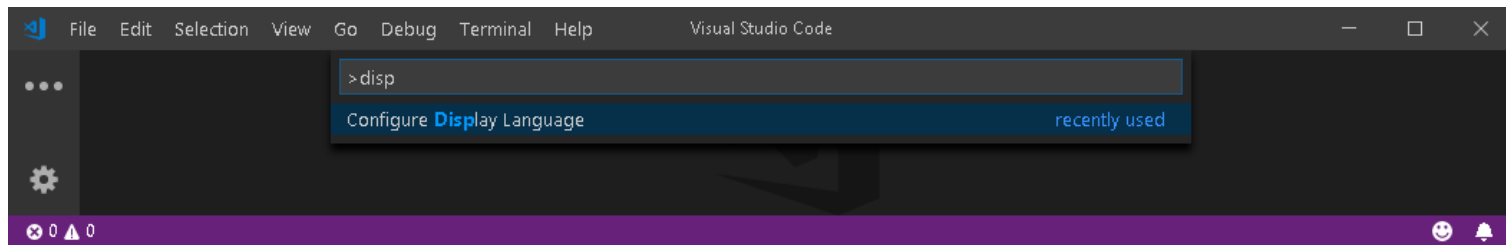




Node.js 시작하기

Visual Studio Code

➤ 한글화 -> F1 -> Configure Display Language



```
{ "locale.json" x
1 {
2   // Defines VS Code's display language.
3   // See https://go.microsoft.com/fwlink/?LinkId=761051 for a list of sup
4   "locale": "en" // Changes will not take effect until VS Code has been r
5 }
```



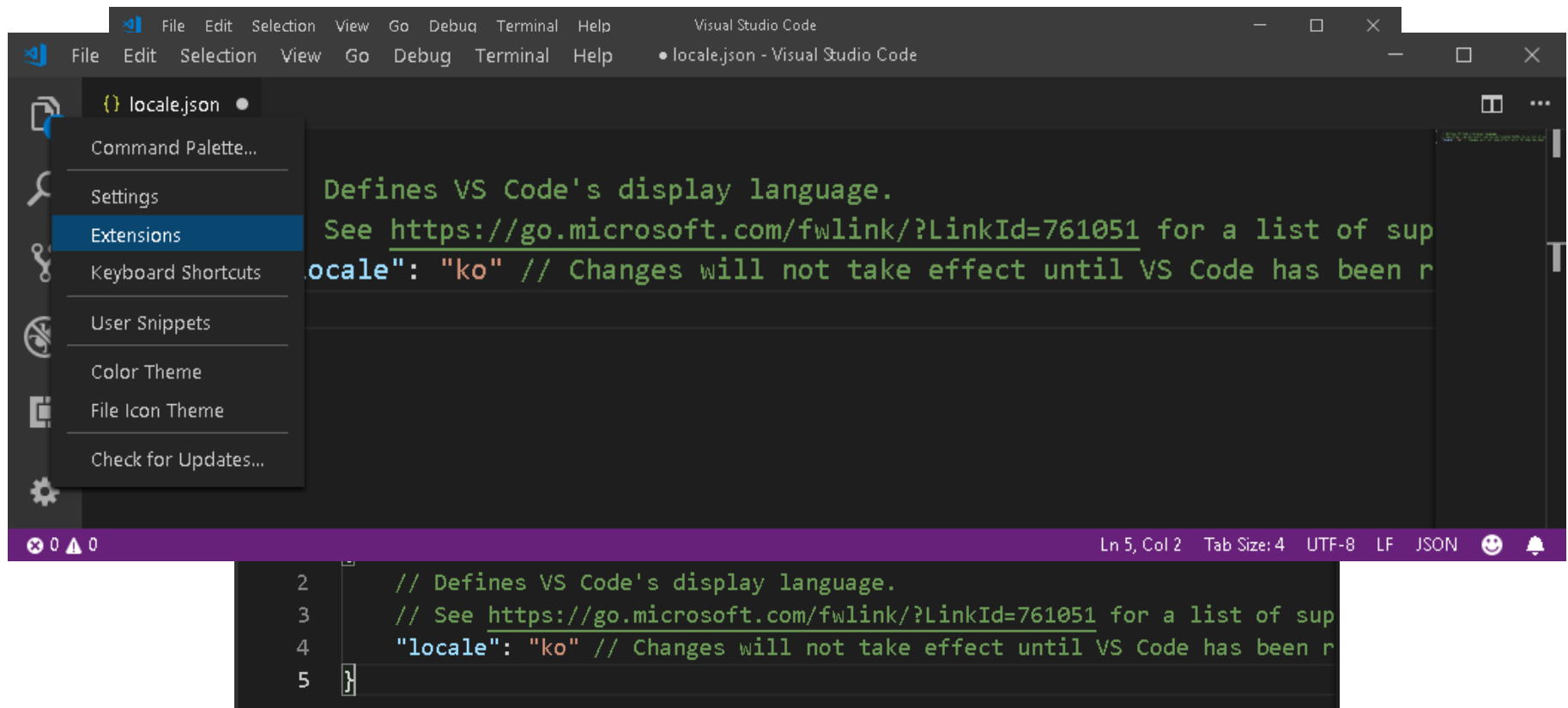
```
{ "locale.json" •
1 {
2   // Defines VS Code's display language.
3   // See https://go.microsoft.com/fwlink/?LinkId=761051 for a list of sup
4   "locale": "ko" // Changes will not take effect until VS Code has been r
5 }
```



Node.js 시작하기

Visual Studio Code

➤ 한글화 -> F1 -> Configure Display Language

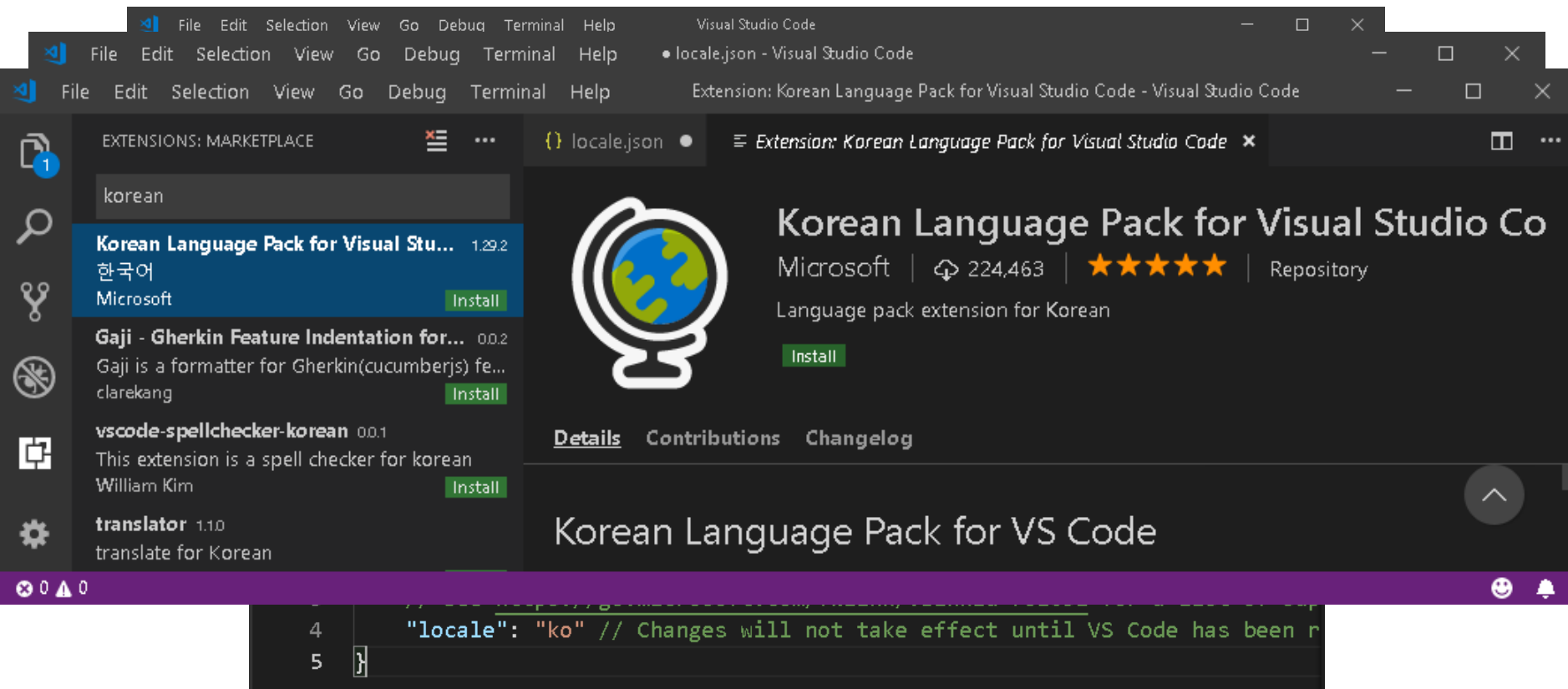




Node.js 시작하기

Visual Studio Code

➤ 한글화 -> F1 -> Configure Display Language

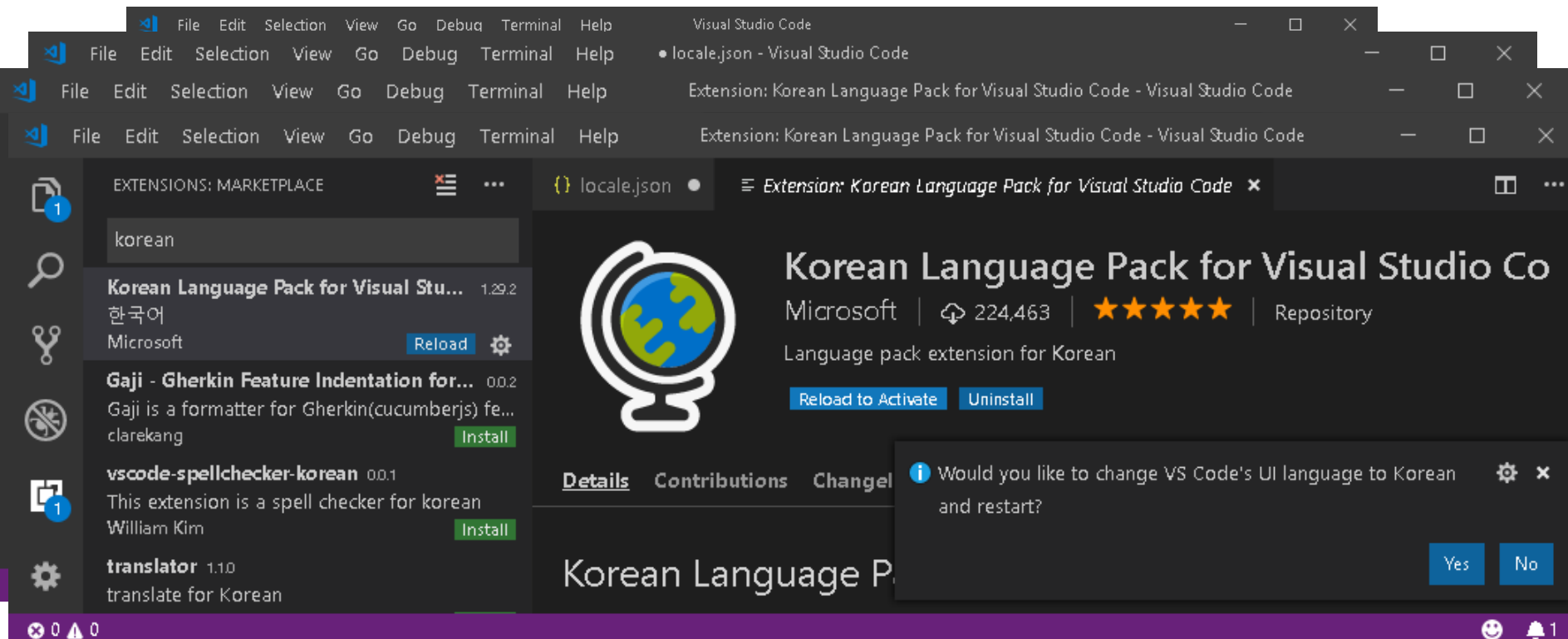




Node.js 시작하기

Visual Studio Code

➤ 한글화 -> F1 -> Configure Display Language





Node.js 시작하기

▶ HELLO NODE JS

Visual Studio Code interface showing a Node.js project setup. The Explorer sidebar on the left shows a file tree with 'main.js' selected. The Editor pane shows the code for 'main.js' with two lines:

```
1 var msg = 'Hello Node.js';
2 console.log(msg);
```

The Output pane at the bottom shows the command executed:

```
C:\Program Files\nodejs\node.exe --inspect-brk=5889 StartNode.js\main.js
Debugger listening on ws://127.0.0.1:5889/a6dd7a74-082d-4e80-89eb-cb1ae86d3598
For help, see: https://nodejs.org/en/docs/inspector
Hello Node.js
```



Node.js 시작하기

➤ Express 사용하기

➤ npm install -g express-generator

```
문제  출력  디버그 콘솔  터미널
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

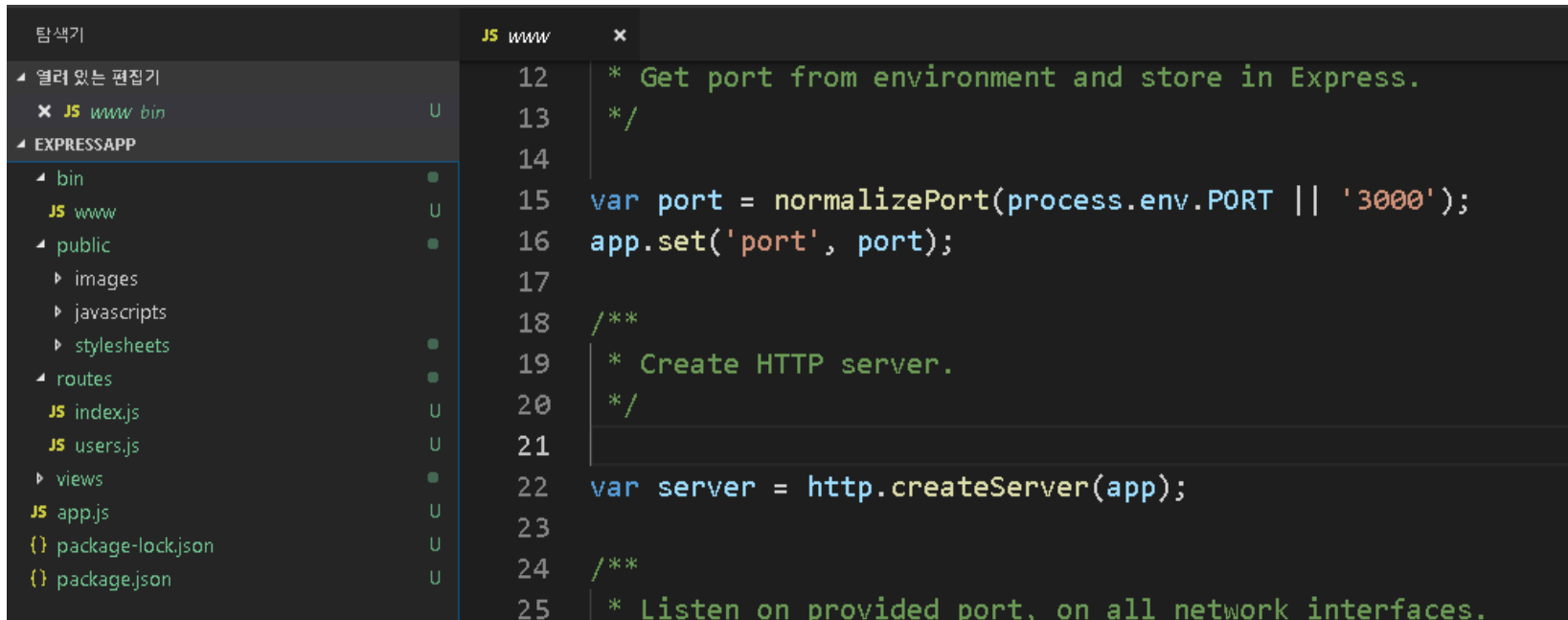
PS C:\Users\rukis\Documents\NetworkProgrammingStudy> npm install -g express-generator
```

➤ express ExpressApp

```
문제  출력  디버그 콘솔  터미널
+ express-generator@4.16.0
updated 1 package in 1.191s
PS C:\Users\rukis\Documents\NetworkProgrammingStudy> express ExpressApp
```

Node.js 시작하기

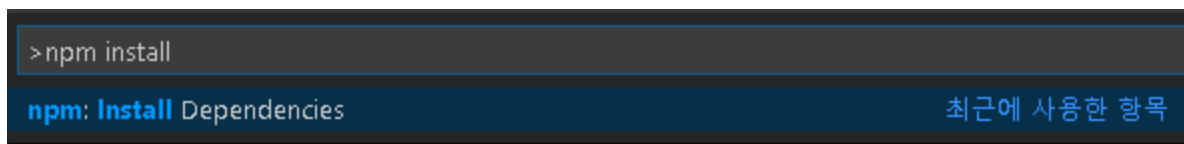
➤ Express 프로젝트 생성



The screenshot shows a code editor with a file explorer on the left and a code editor on the right. The file explorer shows the project structure for 'EXPRESSAPP' with files like 'bin', 'public', 'routes', 'views', 'app.js', 'package-lock.json', and 'package.json'. The code editor shows the 'server.js' file with the following code:

```
12 * Get port from environment and store in Express.
13 */
14
15 var port = normalizePort(process.env.PORT || '3000');
16 app.set('port', port);
17
18 /**
19 * Create HTTP server.
20 */
21
22 var server = http.createServer(app);
23
24 /**
25 * Listen on provided port, on all network interfaces.
```

➤ F1 -> npm install



The screenshot shows a terminal window with the command `> npm install` entered. The output is `npm: Install Dependencies`. There is also a text label `최근에 사용한 항목` (Recently used items) in the bottom right corner.

Node.js 시작하기

- Express 프로젝트 생성
- 빌드 -> F5, 웹 접속 (localhost:3000)

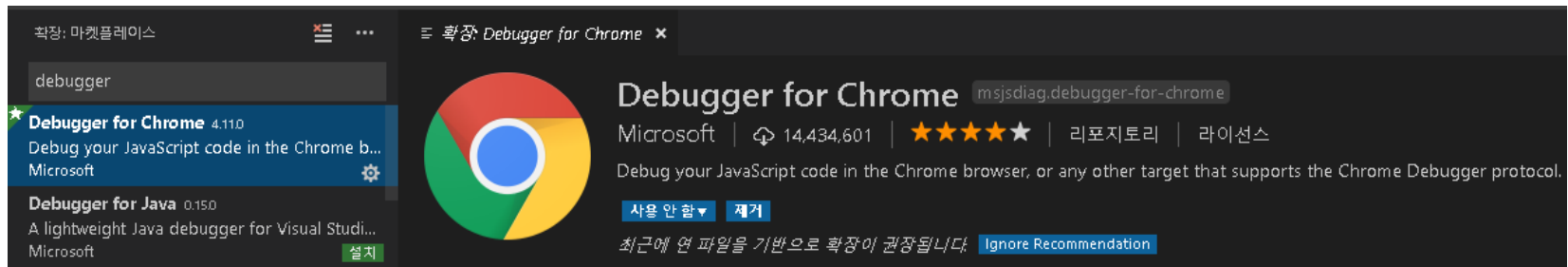


Express

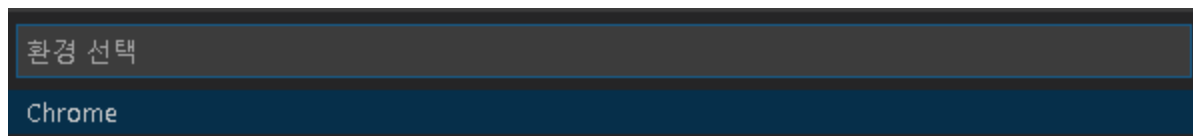
Welcome to Express

Node.js 시작하기

- Express 프로젝트 (Debugging)
- Debugger for Chrome 확장 설치

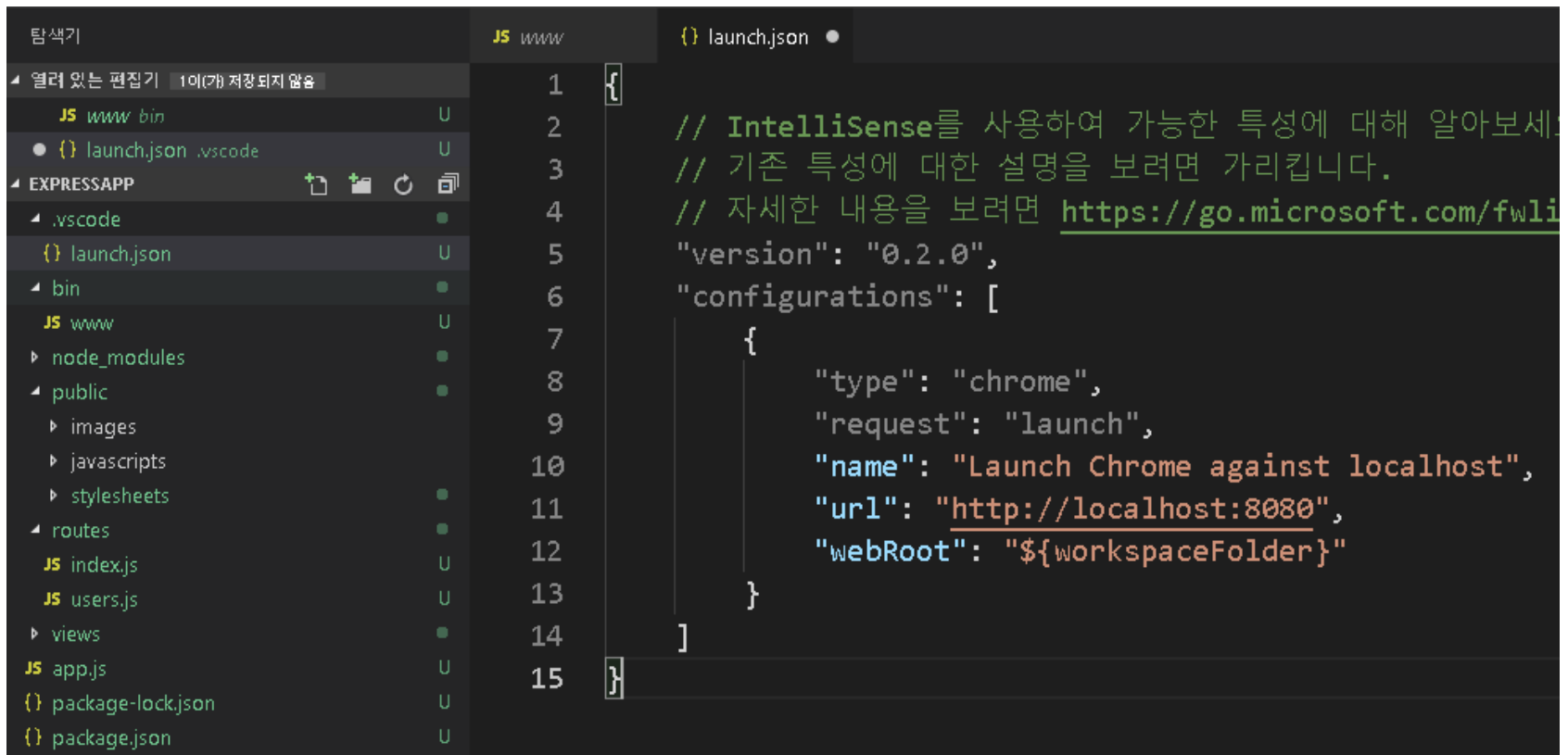


- 빌드 > F5 > Chrome



Node.js 시작하기

- Express 프로젝트 (Debugging)
- .vscode/launch.json 파일 자동생성



```
1 {  
2     // IntelliSense를 사용하여 가능한 특성에 대해 알아보세요.  
3     // 기존 특성에 대한 설명을 보려면 가리킵니다.  
4     // 자세한 내용을 보려면 https://go.microsoft.com/fwlink?linkID=2147297  
5     "version": "0.2.0",  
6     "configurations": [  
7         {  
8             "type": "chrome",  
9             "request": "launch",  
10            "name": "Launch Chrome against localhost",  
11            "url": "http://localhost:8080",  
12            "webRoot": "${workspaceFolder}"  
13        }  
14    ]  
15 }
```



Node.js 시작하기

➤ Express 프로젝트 (Debugging)

```
1 {
2     // IntelliSense를 사용하여 가능한 특성에 대해 알아보세요.
3     // 기존 특성에 대한 설명을 보려면 가리킵니다.
4     // 자세한 내용을 보려면 https://go.microsoft.com/fwlink/?linkid=830387을(를) 방문하세요.
5     "version": "0.2.0",
6     "compounds": [
7         {
8             "name": "프로그램 시작",
9             "configurations": ["Launch Program", "Launch Chrome"]
10        }
11    ],
12    "configurations": [
13        {
14            "type": "chrome",
15            "request": "launch",
16            "name": "Launch Chrome",
17            "url": "http://localhost:3000",
18            "webRoot": "${workspaceFolder}"
19        },
20        {
21            "type": "node",
22            "request": "launch",
23            "name": "Launch Program",
24            "program": "${workspaceFolder}\\bin\\www"
25        }
26    ]
27 }
```

문제 출력 디버그 콘솔 터미널

```
C:\Program Files\nodejs\node.exe bin\www
GET / 304 389.901 ms - -
GET /stylesheets/style.css 304 1.871 ms - -
GET /favicon.ico 404 16.503 ms - 1412
```

구성 추가...



Node.js + Express + Html

<http://jade-lang.com/>

<https://ejs.co/>

➤ Jade vs Ejs

➤ Jade 의 경우 기능이 더 뛰어나다.

➤ Ejs 의 경우 html 코드를 그대로 사용하여 이질감이 없다.

➤ 터미널

➤ npm uninstall jade

➤ npm install ejs

➤ App.js 코드

```
// view engine setup
app.set('views', path.join(__dirname, 'views'));
/// ***** html 사용을 위한 ejs module 추가
app.engine('html', require('ejs').renderFile);
app.set('view engine', 'html');
```



Node.js + Express + Html

➤ app.js

<https://www.w3schools.com/html/>

<https://ejs.co/>

```
// view engine setup
app.set('views', path.join(__dirname, 'views'));
/// ***** html 사용을 위한 ejs module 추가 *****
app.engine('html', require('ejs').renderFile);
app.set('view engine', 'html');
```

➤ r

```
res.render('index', { title: 'test' });
```

➤ views/index.html

```
<html> <head>
<title><%=title%></title> </head>
<body>
<h1>This is a Heading</h1>
<p>This is a paragraph.</p>
</body> </html>
```

Node.js 데이터 입력

➤ routes/index.js

<https://www.w3schools.com/html/>

```
// POST
router.post('/', function (req, res) {
  var returnVal = { result: '' };
  if (req.body.msg) {
    console.log("client message : " + req.body.msg);
    returnVal.result= 'success';
  }
  else {
    returnVal.result= 'failure';
  }
  res.json(returnVal);
});
```




Node.js 데이터 입력

➤ javacripts/test.js

<https://www.w3schools.com/html/>
<https://api.jquery.com/>

```
function test()
{
    var data = { msg:
        $("#name").val()
    };
    console.log(data);
    $("#result").text(data.msg);
    $.ajax({
        type: 'POST',
        url: '/',
        data: data,
        contentType:
            'application/json',
        async: true,
        success: function (data) {
```

```
        var res = data;
        if (res.result == 'success') {
            console.log("success!!");
        } else if (res.result ==
            'failure') {
            console.log("failure!!");
        } else {
            alert(JSON.stringify(res));
        }
        $("#result").text(res.result)
    });
}
```



Node.js 데이터 입력

➤ views/index.html

<https://www.w3schools.com/html/>

```
<head>
<title><%=title%></title>
<script type="text/javascript" src="https://code.jquery.com/jquery-3.3.1.min.js">
<script type="text/javascript" src="/javascripts/test.js"/>
</head>
```

```
<body>
  User Name: <input type="text" id="name" name="name" value="test">
  <br/>
  <button onclick="test()">input</button>
  <br/>
  result: <label id="result"></label>
</body>
```

Node.js 소켓 프로그래밍



<https://www.npmjs.com/package/ws>

➤ Websocket vs Socket.io

➤ Websocket

- http Web은 http프로토콜을 이용 요청 / 응답 동작
- Web에서 TCP/IP Socket 처럼 실시간 통신 할 수 없음
- 그래서 등장 WebSocket(ws) 프로토콜
- Websocket을 이용하면 웹브라우저
- 실시간 데이터 주고 받을 수 있음
- 최근 대부분 브라우저에서 Websocket지원
- InternetExplorer 의 경우 version 10부터 지원

Node.js 소켓 프로그래밍



➤ Websocket vs Socket.io

<https://socket.io>

➤ Socket.io

- Node.js 기반 Opensource Library
- Websocket처럼 실시간 데이터 처리 가능
- 멀티 디바이스 (Web, android, iOS, Windows, 등)
- Websocket이 지원되지 않는 브라우저도 가능

Node.js 응용 프로그래밍



➤ Electron

- <https://electronjs.org/docs/tutorial/first-app>
- <https://github.com/electron/electron-quick-start>
- <https://github.com/electron/electron-api-demos>

Node.js 응용 프로그래밍



➤ Electron

➤ https://rukistar.visualstudio.com/_git/NetworkProgramming