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ROCK 'N ROLL WITH VSCODE

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ROCK 'N ROLL WITH VS CODE

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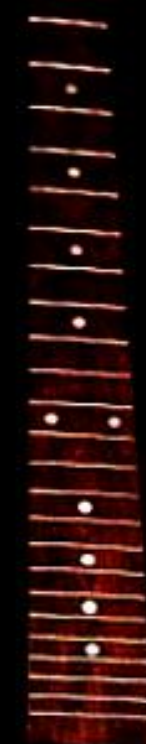


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Who has never worked with VSCode?







What is VSCode?

Light-weight, multi-platform source code editor:

- Windows, macOS, Linux   
- Built-in support: JavaScript, TypeScript, Node.js

Key strength: extensibility
(through built-in API)

Rich ecosystem of extensions:

- Languages: C++, C#, Python, PHP, ...
- Runtimes: .NET, Unity, ...
- Utilities:
 - debuggers,
 - code analysis,
 - themes,
 - snippets,
 - ...

AL Language extension for
developing for Dynamics NAV



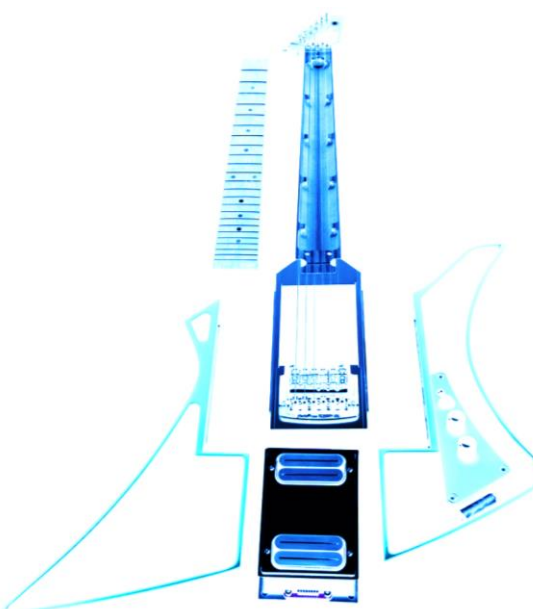
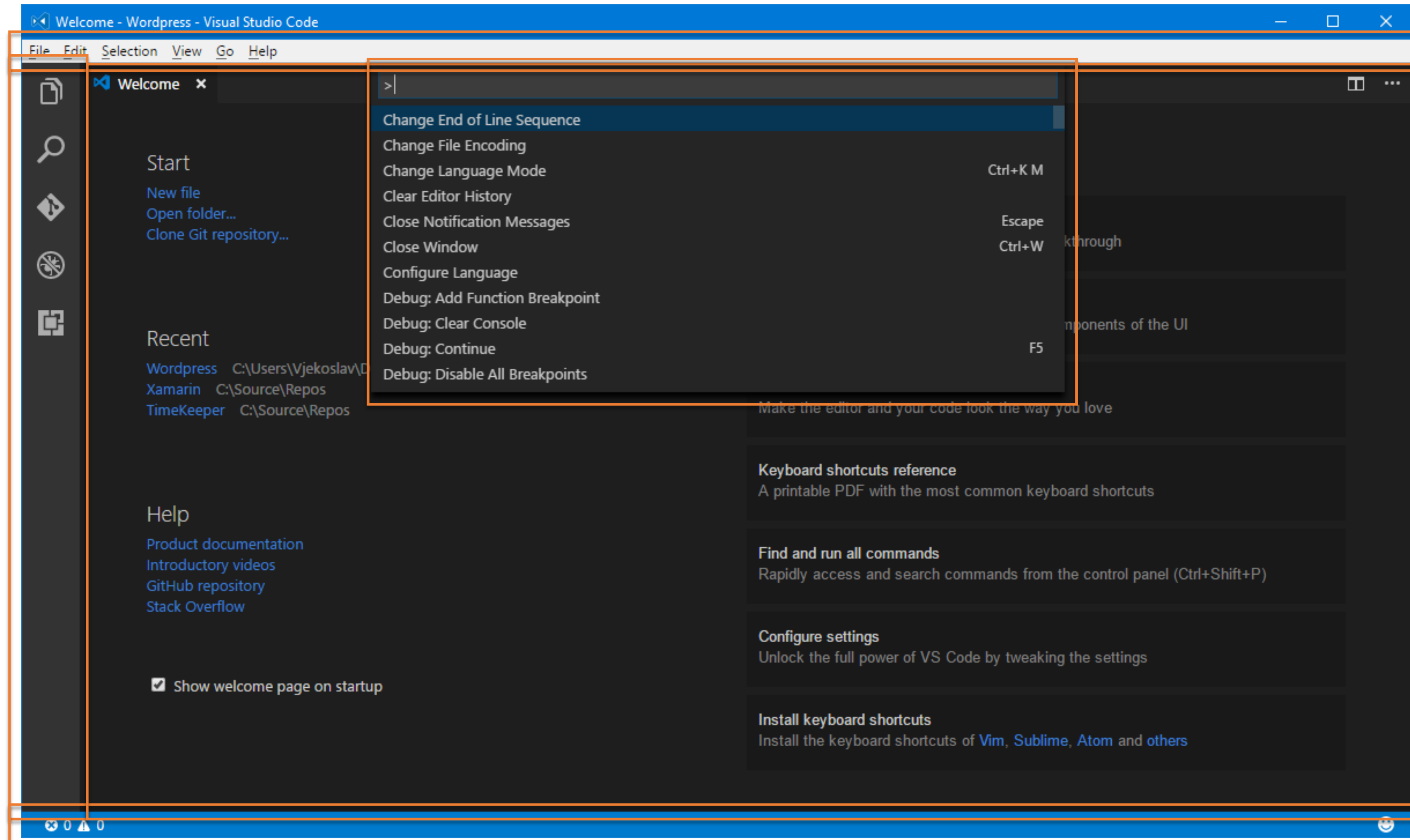
VS Code Anatomy

Menu

Command
Palette

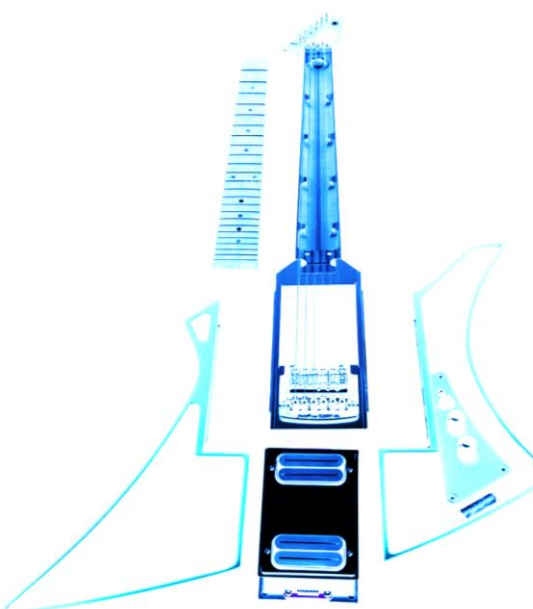
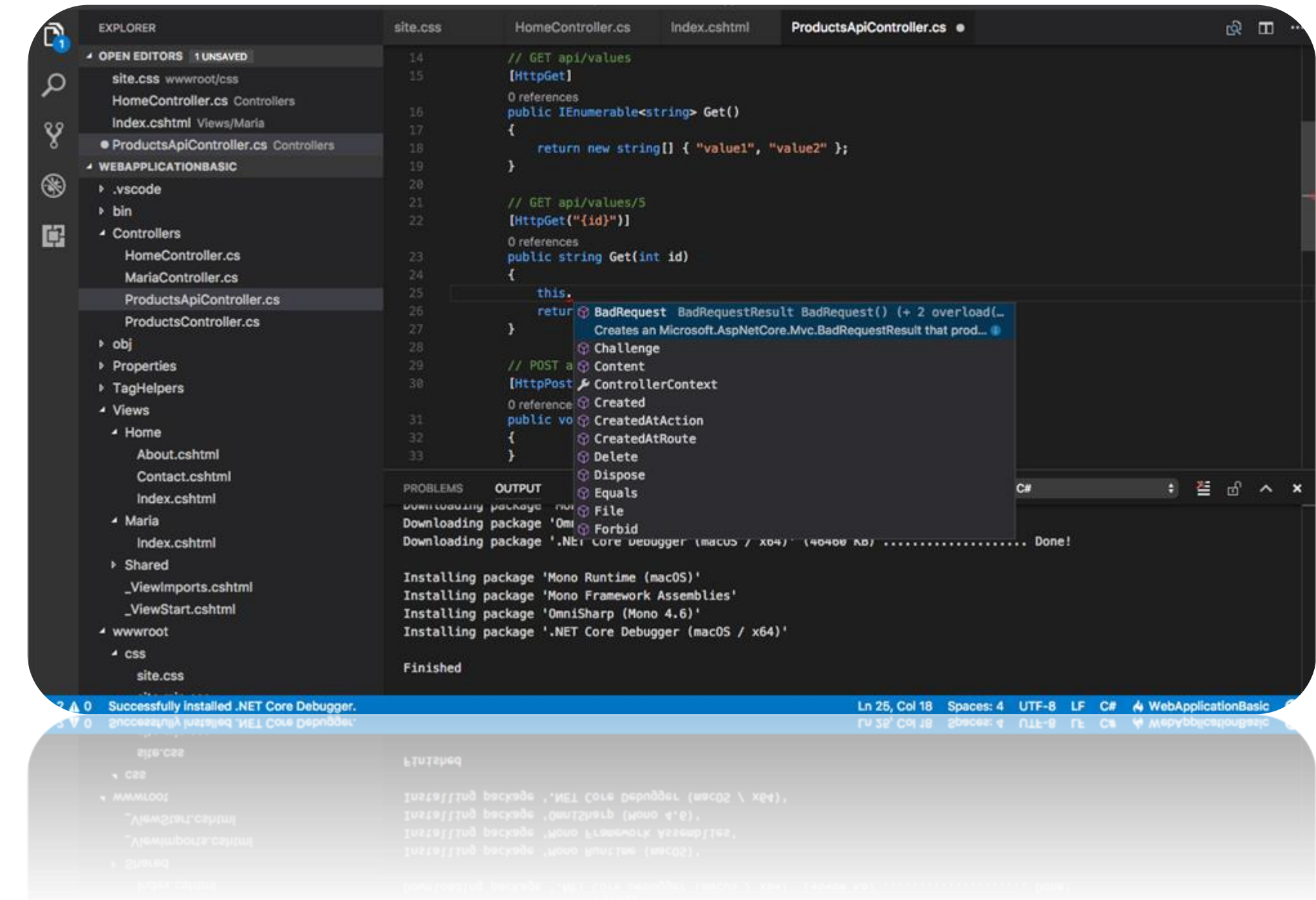
Text Editor
Activity bar

Status bar



Working in VSCode

- Workspace
 - Directory with files
- Command Palette
- Configurations
 - User / Workspace
 - Snippets
 - Keyboard Shortcuts
- Source Control Integration
- Debugger
- Extensions
 - 3rd party extensions
 - Your own extensions
- ...



Source Control Management



Source Control Management



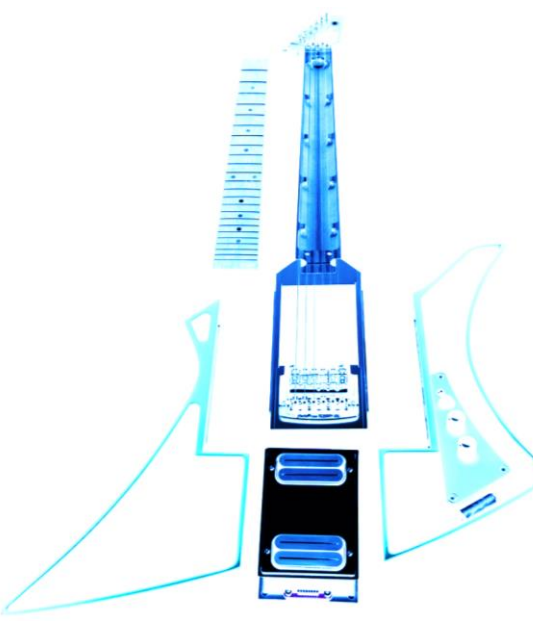
Source Control Management

Integrated feature of Visual Studio Code

Native support of Git

SCM providers available for many other technologies:

- VSTS
- Mercurial
- SVN
- Perforce

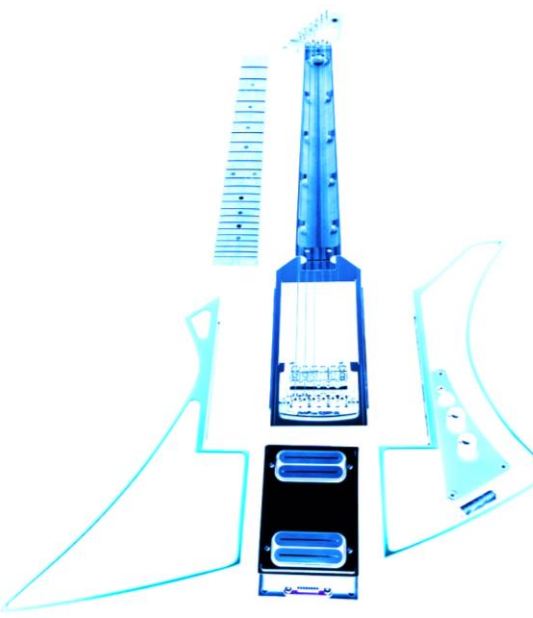


Git support

VS Code supports invoking base git commands from within its UI

- Commands are always forwarded to local OS
- To execute commands from Code
 - Git support must be installed on the machine
 - Git must be supported on command line

Until Git is installed on the machine, VS Code cannot do anything, even with a git-based SCM provider (such as VSTS)



Installing Git support

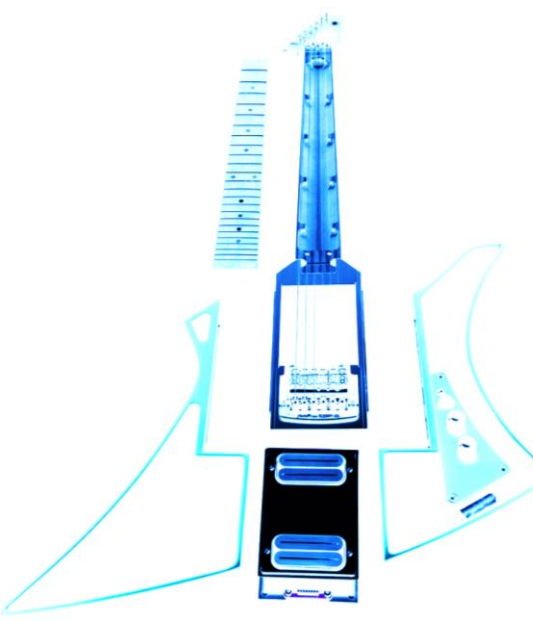
Install a third-party Git tool for command line

Install Git from <https://git-scm.com/download/win>

Make Git available on command line through PATH (done automatically with Windows installer)

Configure Git tools on your machine by providing username and e-mail configuration options

```
git config --global user.email "you@example.com"  
git config --global user.name "Your Name"
```



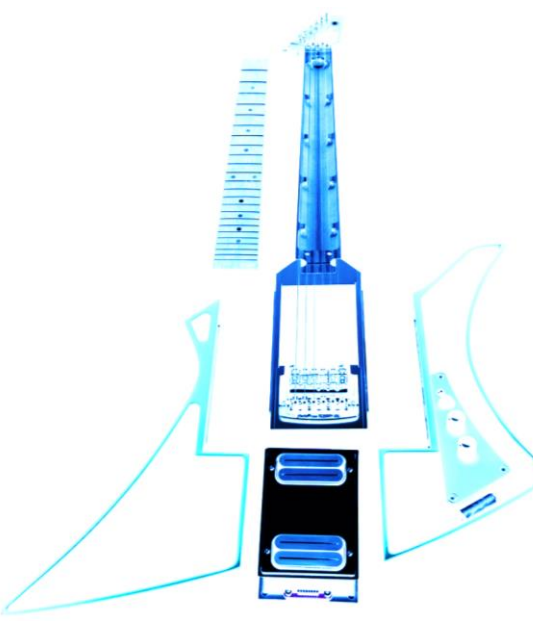
After Git support is installed

Git: commands in command palette are working

Commands are populated in the More button in the Source Control pane

For this to work, a repository must be initialized

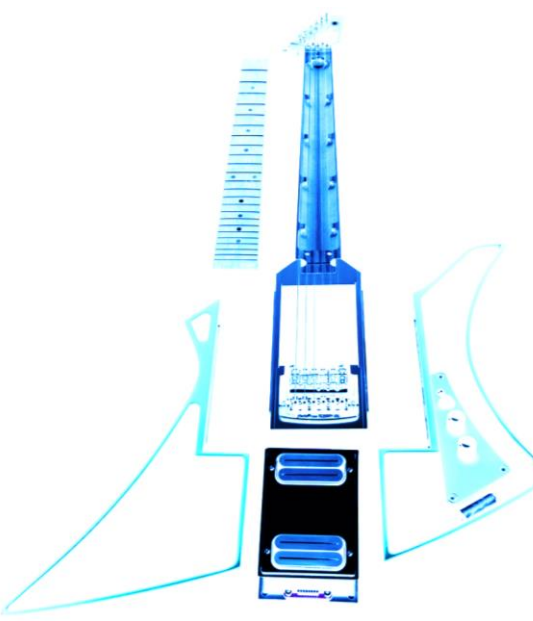
- Having Git installed on machine is not enough
- You must have a Git-aware workspace



Initializing a Git repository

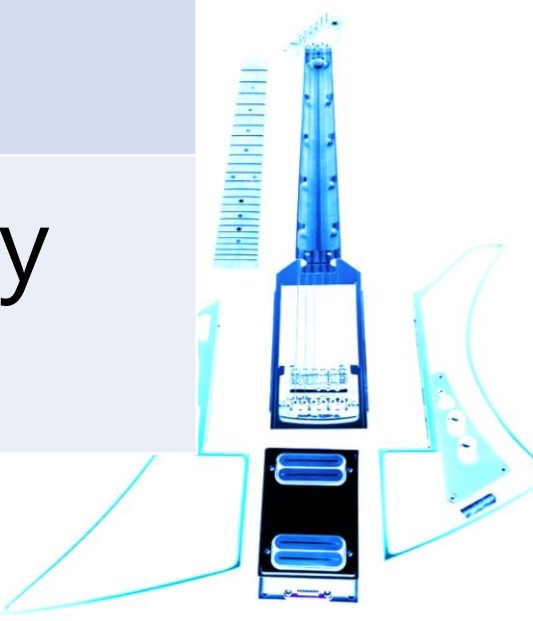
There are two ways of initializing a local Git repository

- **Easy:** clone an existing Git repository from a remote Git source (GitHub, VSTS, some other...)
- **Less easy:** initialize a repository, then push it to a remote repository



Some Git terminology

Term	Meaning
Repository	A project folder that contains all files that belong to an individual project.
Remote	A version of a project that is hosted on a remote server, that can then be synced with a local repository.
Clone	A local copy of a remote repository that allows you to work offline.
Push	Sending committed changes from local repository to remote.
Pull	Retrieving the changes from remote repository and merging them to local repository.
Fetch	Same as pull, without merging – this can be done manually later.
Branch	A version of repository different than master, allowing you to work without disrupting the “live” version.
Merge	Applying changes done in one branch onto another branch, most commonly master.



13:30

Source Code Management with VSCode Made Easy

Soren Klemmensen
Jonas Andersen

Clone a repo



Merging Conflicts

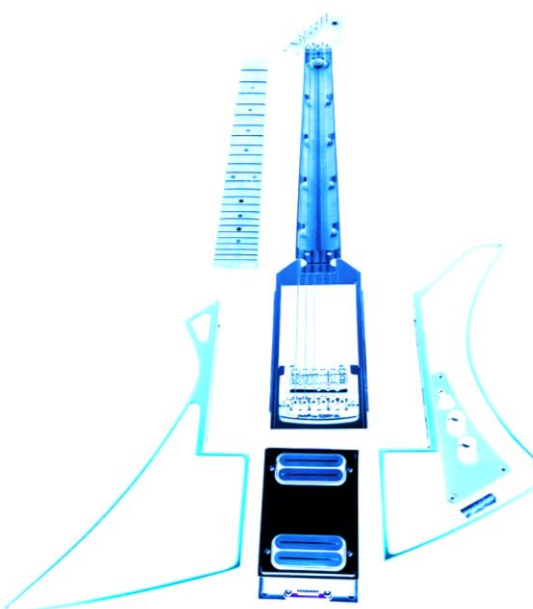
Changes are merged automatically

Changes on the same source file are indicated as conflicts

Conflicts indicators are injected into the source file, and have to be resolved before the file is usable again

```
1 reference
codeunit 70051001 HelloWorld
{
    TableNo = Customer;

    trigger OnRun();
    var
        HelloText : Codeunit GreetingsManagement;
    begin
        Accept Current Change | Accept Incoming Change | Accept Both Changes | Compare Changes
        <<<<<<< HEAD (Current Change)
            Message('%1 %2.', HelloText.GetRandomGreeting(), Rec.Name);
        =====
            Message('%1 %2!', HelloText.GetRandomGreeting(), Rec.Name);
        >>>>>>> 4cb02cb40f24505d14ac57ab2413929ebd6d4218 (Incoming Change)
    end;
}
```

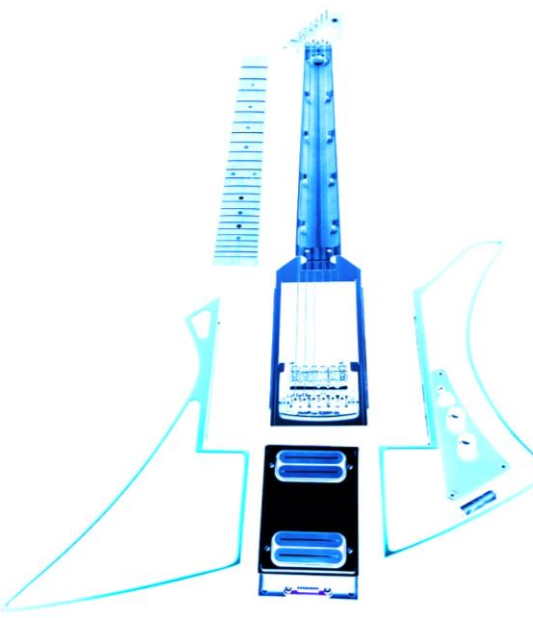


.gitignore

Ignores files for check in.

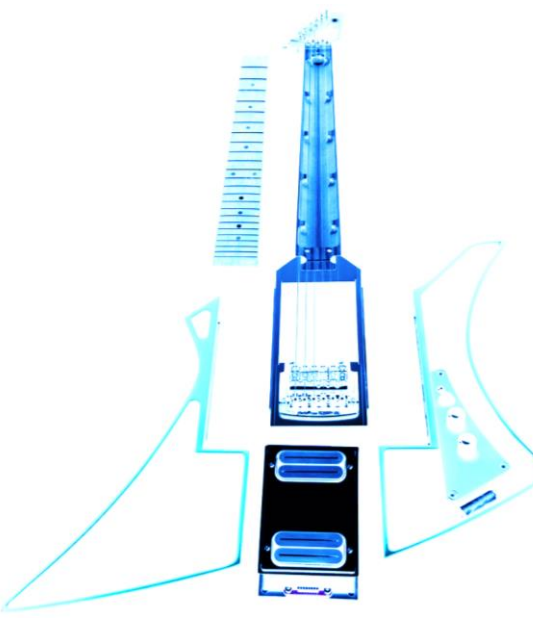
For al-development, it makes sense to add the .app files to the .ignore.

Beware of the dependent .app files, though!

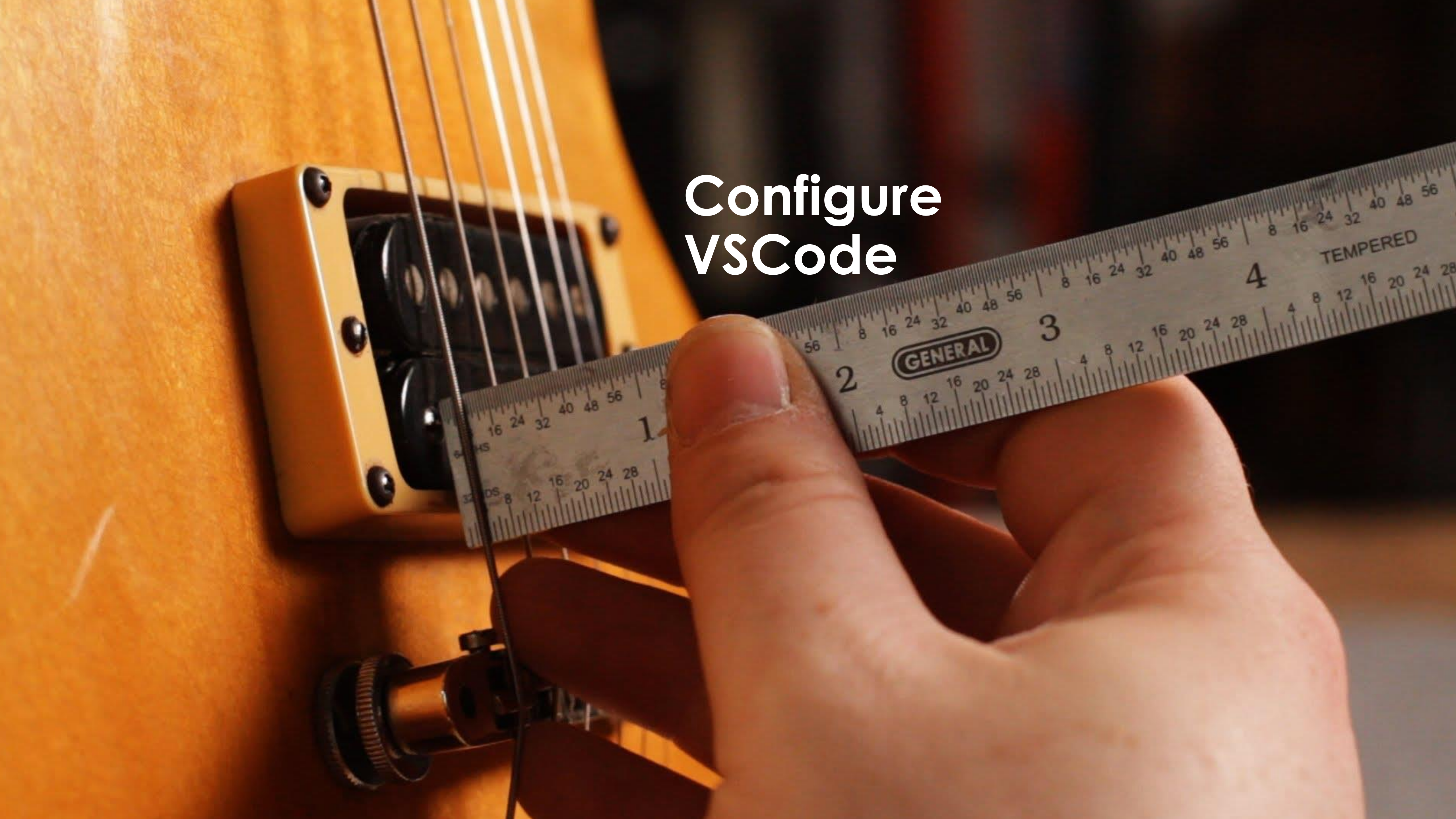




Command Palette

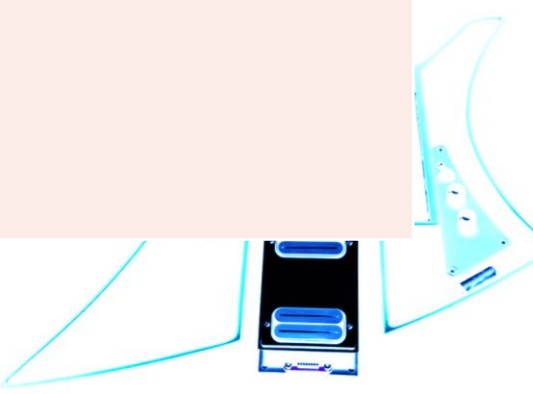


Configure VSCode



Most commonly used configuration files

Configuration file	Use
User settings (settings.json)	<ul style="list-style-type: none">• Configuration settings that apply to the entire application• Override any default application settings and behavior.
Workspace (settings.json)	<ul style="list-style-type: none">• Workspace-level (directory) configuration settings that apply to a specific workspace• Override user settings
Language snippets ({language}.json)	<ul style="list-style-type: none">• Define user-configurable snippets• Available per language• Editor must be in the specified language mode
Keyboard shortcuts (keybindings.json)	<ul style="list-style-type: none">• Define application-wide keyboard shortcuts• Override any application defaults• Override any installed keymaps



Snippets - basics

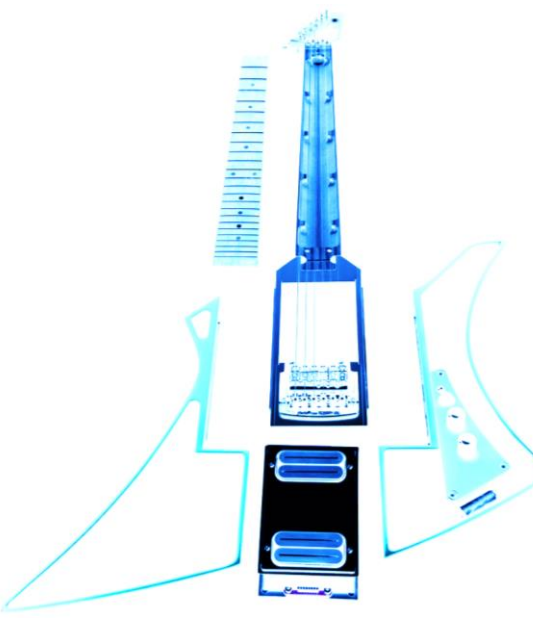
It's not “Just” text.

Placeholders help you to identify the variable places that needs change. It is possible to identify the place with a certain description.

You can add “choices” to help the developer in the right direction.

Variables:

- \$TM_FILENAME
- \$TM_CURRENT_WORD
- \$SELECTION



A black and white photograph of a person wearing a Guy Fawkes mask, a symbol often associated with hacktivism. The person is wearing a dark t-shirt and is playing an acoustic guitar. The background is a textured, light-colored wall. The text "Editing Hacks" is overlaid in the center of the image.

Editing Hacks

A photograph of two monkeys in a forest setting. The monkey on the left is larger and has brownish-grey fur, while the monkey on the right is smaller and has lighter grey fur. They are both sitting and grooming each other. The background is a dense forest with green foliage and sunlight filtering through the leaves, creating a bokeh effect. The word "Debugging" is written in white text across the middle of the image.

Debugging

Interesting Extensions

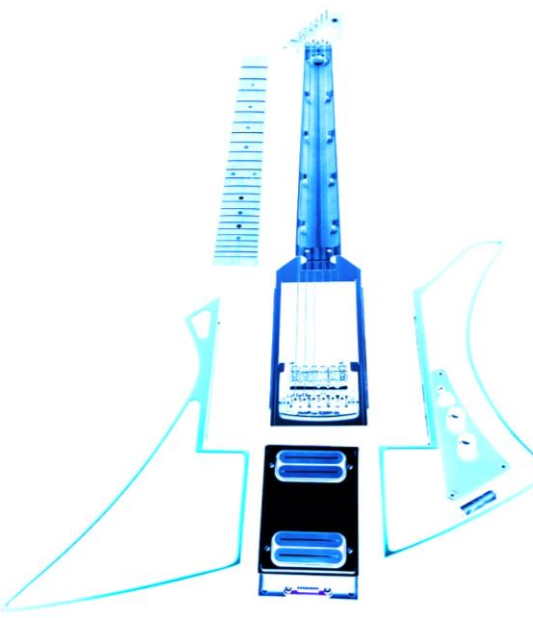


Visual Studio Code extensions

Visual Studio Code provides extensive functionality for extensibility

Extensions run as Node.js services

- Each extension is a separate host process
- Extensions do not interfere with each other
- Extensions do not interfere with Visual Studio Code



What can be provided through extensions

Language modules (compilers, syntax highlighters)

Debuggers

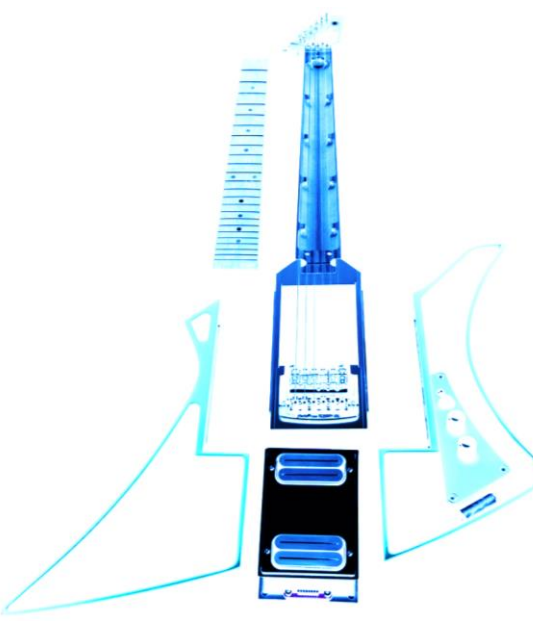
Themes

Snippets

Colorizers

Icon packs

Many more...



Managing extensions

Searching

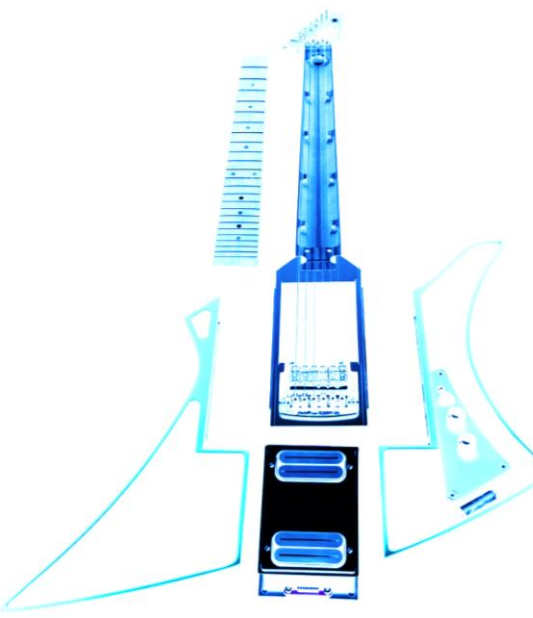
Installing

Disabling

Enabling

Updating

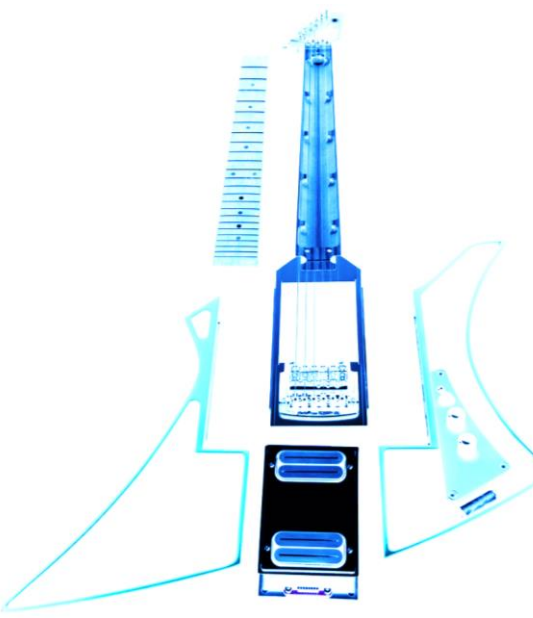
Recommendations



Installing extensions

From Marketplace

From vsix files



So let's dive into some interesting ones...

snippets



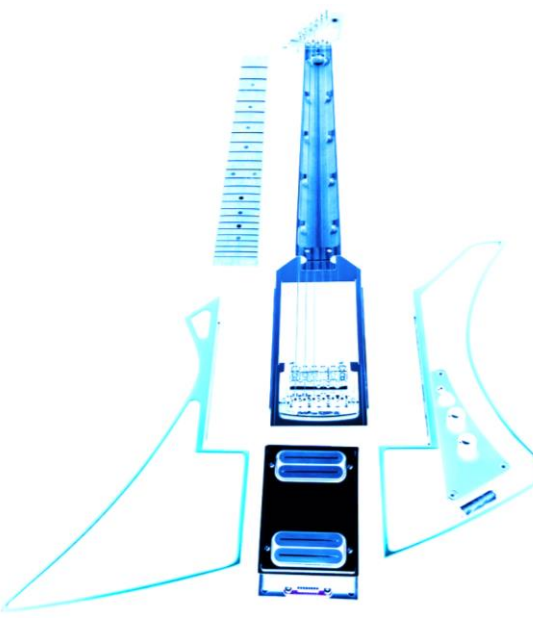
Snippet Creator



Snippet Creator



Feature: create snippet from selected code



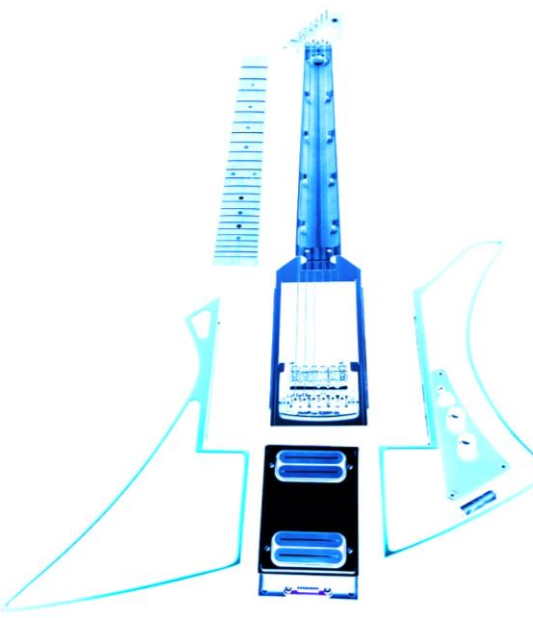


Git Hub



Features:

- Check, Create, Merge, ... pull requests
- Open browser
 - Current project
 - Current file (including cursor point)
 - Pull requests
 - Open issues
- Display pull request in status bar
- ..



Git History

1952

Les Paul

While successfully experimenting with the "Les Paul" guitar, Les Paul took his ideas to Gibson. They turned him down at first, but he persisted, and they eventually gave him the guitar "the broomstick with a pickup on it". In 1950 though, Gibson came back to him and signed him and his design.

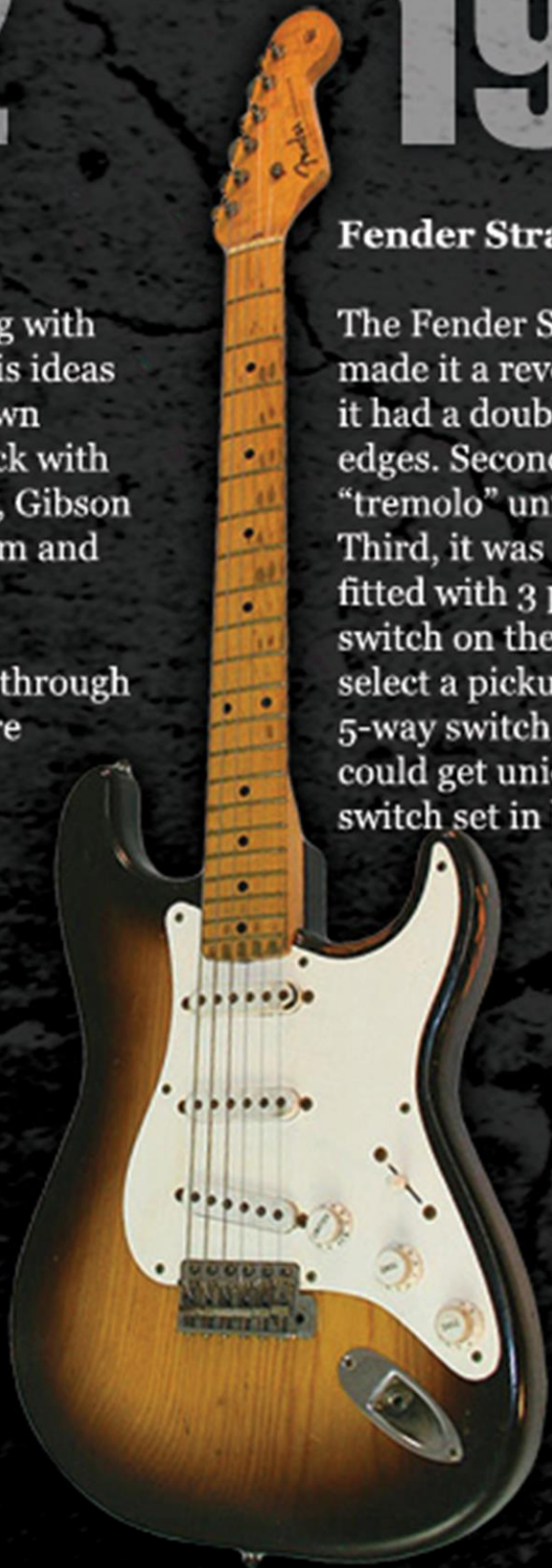
At Gibson, Les Paul went through 60 prototype guitars before he was happy with his final design.



1954

Fender Stratocaster

The Fender Stratocaster had 3 features that made it a revolutionary guitar in 1954. First, it had a double cutaway neck with beveled edges. Second, it had the Fender engineered "tremolo" unit built into the floating bridge. Third, it was the 1st solid body guitar to be fitted with 3 pickups. A 3-way selector switch on the guitar allowed the guitarist to select a pickup. This was later changed to a 5-way switch, as guitarists began to see they could get unique sounds by having the switch set in between the 3 positions.



1979

Van Halen "Frankenstrat"

Eddie Van Halen's "Frankenstrat" guitar marked the beginning of guitars made for the hyperfast, technical playing. Van Halen pioneered employing higher output pickups, state of the art floating tremolo units, and sleeker, more profiled necks and bodies to play faster on. Virtually every major manufacturer raced to come out with models all based on Eddie's original guitar as well as giving rise to many newer companies such as Charvel, ESP and Ibanez.



1982

Jackson Randy Rhodes

The Jackson Randy Rhodes guitar represents design and technology changes that were happening with guitars in the 1980s. Randy Rhodes wanted to design a guitar that resembled a shark's fin. Having less wood on the side of the guitar with the treble strings allowed those strings to give a better treble response.



1994

Ibanez 7-String Guitar

The 7-string solid body guitar was originally developed in the early 90s by Steve Vai with Ibanez guitars. The instrument didn't come into prominence until 1994 when Korn featured Ibanez Universe guitars on their debut album. Drawn to the massive low end produced by the 7th string (typically a low A), many bands and manufacturers jumped on the seven string bandwagon. Today the 7-string still rumbles and shreds on with artists like Muse, Dream Theater, and Suicide Silence.



2008

Guitar Hero Controller

Maybe not a real guitar, but the rise of guitar-based video games has made quite an impact. Whole new generations of would-be guitarists are being introduced to the actual guitar via a neck with a few colored control buttons! With sales of the Guitar Hero and Rock Band video games in the millions it's hard to deny the impact made on pop culture. Major artists now get made into game characters and everyone can get their chance to "shred"!

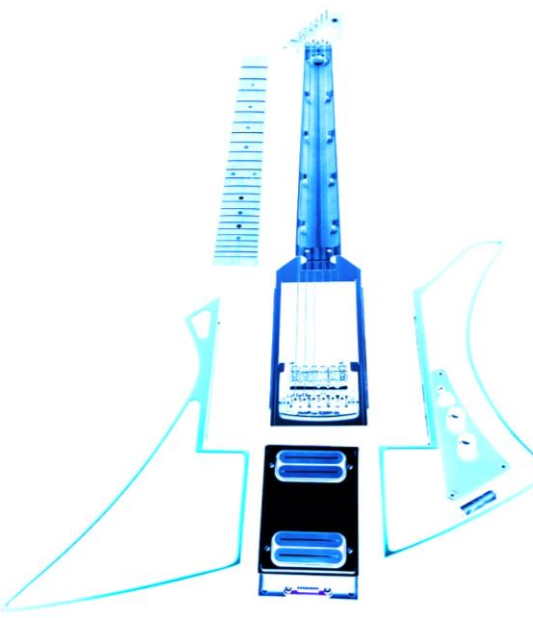


Git History



Features:

- View Git History with graph and details
- View details of a commit (author, ..)
- View previous copy of the file
- Compare



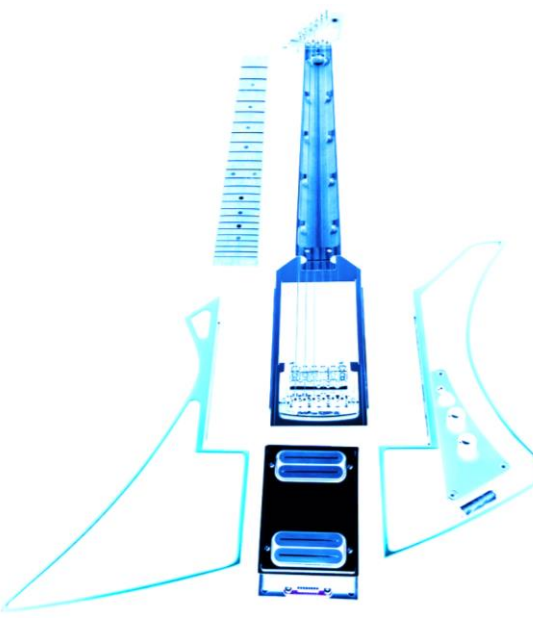
REST Client



REST Client



- Send/Cancel/Rerun HTTP requests from the editor
 - View response
 - Support multiple requests in the same file
 - Auth: Basic, Digest, SSL client certificates
 - Variables
 - Generate code (not to al ☹ (yet?))
-
- Useful for all your Web Service-stuff
 - NAV Web Services
 - External Web Services





MSSQL

Microsoft SQL Server

Connection profiles

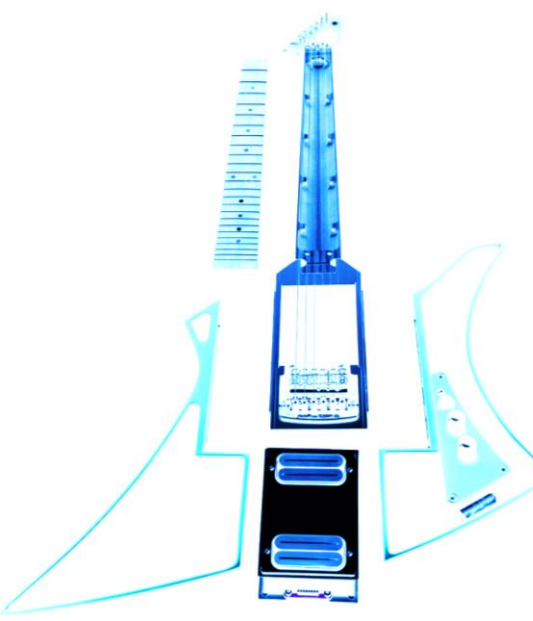
- Microsoft SQL Server
- Azure SQL Database
- SQL Data Warehouses

Save data

- Export as
 - CSV
 - JSON
 - Excel

TSQL Scripts with

- IntelliSense
- Go to definition
- Snippets (starting with "sql")
- Syntax colorizations
- T-SQL error validations
- GO Batch separator



043b-4e4a-9384-28decfd8e3a5 90735bea-161c-45e3-86e3-e598039f83d0 a07426b3-4bcf-4f9c-8460-00e9eec2055e ab31ba54-1b14-4c26-8f96-5d42ccdb7995 244bddc3-c23c-4b0b-8d41-786cd6752bfd 6b1da77e-1cc6-4c18-8305-ed37c20c4738 2d010f31
22-910b-40bf-b5f4-bf3f5e39e3f4 3c338ae9-130d-41fa-979c-9cde1e1188cf 964c5925-c254-4855-aa61-5c6cb0adfca3 bdd13f5d-4951-4ede-912b-67ae88d1d32e 54547ebe-db46-4754-a34b-89baceb2f34b a22d98ae-1332-49f3-90f7-8f1d00de8e2c e426
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15-46f1-b004-ed39c338ac38 f0c940f2-a729-406a-a5a8-e015b9369074 81eb6276-ffec-4fd8-a714-e23e8463e7d4 1277043b-cba4-48ce-be36-eaa7df541330 9ebd8071-ee9a-473e-9a9e-b8192ac557c6 2fae52e9-67e7-4da6-b7fd-eldd2d1b5536b 3690f8d7a
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fb0ba6-6fdd-4a75-bb90-65ce94003c28 c2276dd27-6905-4d98-ae6f-23b9f439a6a3 39409344-7c82-4167-b13b-953bd48dbd89 e714dc55-086a-4443-ab9a-d1e3920d7a67 ce4e7012-110f-49c2-b4c4-3a37afbe12f2 4050fdded-56ce-4151-911d-2852a38c9ec3
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0866f90227d4-bd0d-497f-830e-c1a7f2e37afc 685a3ebb-e273-4c6b-9df1-4ffce3772ae9 ad33539-d77c-4d93-b46b-f7ed3be44526 f994b1e2-f592-4103-8978-2d0605985739 259159ee-8ba1-41a9-aaee-b5b1c8acad3e 28bf3c33-762f-4c1a-a6f8-e96482
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59b-4a9e08c1a1d6 bba8e363-a0ba-4a46-8803-52009051f697 024dbd6c-f30d-419b-91f1-c400a2d74e24 b7accf19-1b78-4d2b-ac1e-e80f173bfcdc 2c043435-a609-419d-b7a8-3391fff18ec4 eb5affd6-cla4-4185-908d-2bb224d249e3 3849b098-5ba2-4d82
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Create GUID

Creates a GUID

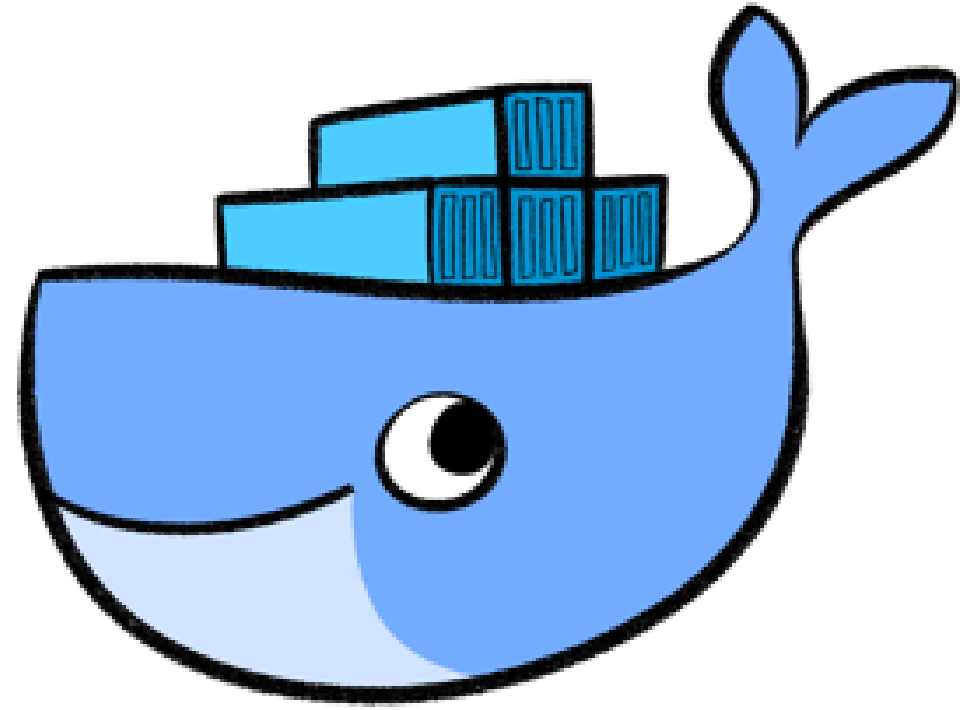




Docker



Docker & Docker Explorer



Docker

Command Palette: most frequently used docker commands

Generate Dockerfile & docker-compose.yml

- Syntax highlighting
- Intellisense
- ...

Docker Explorer

Manage

- Docker Containers
- Docker Images
- Docker Hub
- Azure Container Registry

11:00

Easier and DevOps-friendly Dynamics NAV environments using Docker / Windows Containers

Tobias Fenster
Jakub Vanak
Freddy Kristiansen

PowerShell



PowerShell

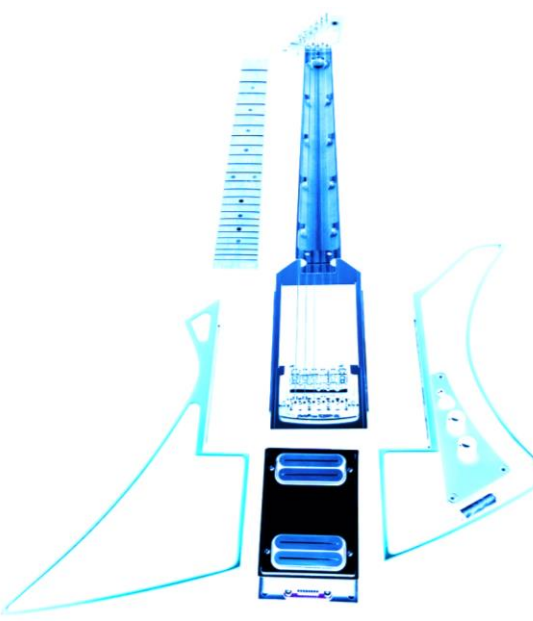


Provides rich PowerShell language support for VSCode.

- Write scripts
- Debug scripts

Features:

- Syntax highlighting
- Snippets
- IntelliSense
- Analyzer
- Go To Definition
- Symbol Discovery
- Run Selection (F8)
- ...



PowerShell

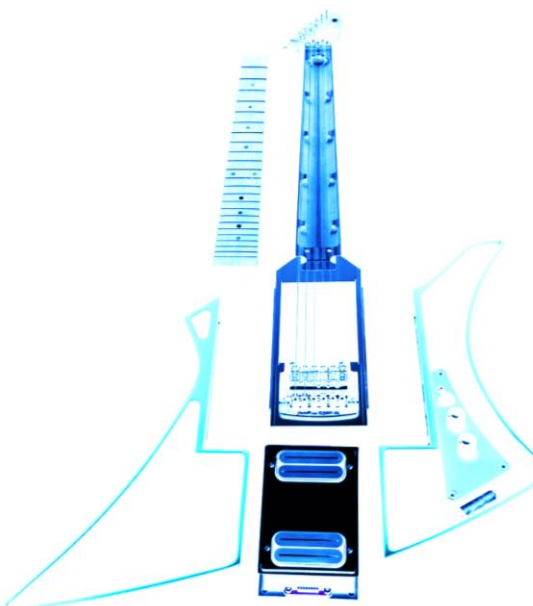


Very useful for App/Extension developement:

- Setup/reset/update Docker containers
- Preserve data while upgrading to new version of app
- ...

Tips:

- Read App.json and Launch.json



Embed



Some extensions, specifically for the al language...


```
!function(){function e(e){var r="Hello, "+e+"!";return r}function r(e){return e&&"object"==typeof e&&"default"in e?e["default"]:e}function n(e,r){return r={exports:{}},e(r,r.exports),r.exports}var o=function(e){var r=e.reduce(function(e,r){return e+r},0);return r},s=n(function(e){function r(e){if(e="" + e,!(e.length>1e4)){var r=/^((?:\d+)?\.\d+)*(milliseconds?|msecs?|ms|seconds?|secs?|s|minutes?|mins?|m|hours?|hrs?|h|days?|d|years?|yrs?|y)?$/i.exec(e);if(r){var n=parseFloat(r[1]),o=(r[2]||"ms").toLowerCase();switch(o){case"years":case"year":case"yrs":case"yr":case"y":return n*i;case"days":case"day":case"d":return n*u;case"hours":case"hour":case"hrs":case"hr":case"h":return n*c;case"minutes":case"minute":case"mins":case"min":case"m":return n*a;case"seconds":case"second":case"secs":case"sec":case"s":return n*t;case"milliseconds":case"millisecond":case"msecs":case"msec":case"ms":return n}}}}function n(e){return e>=u?Math.round(e/u)+"d":e>=c?Math.round(e/c)+"h":e>=a?Math.round(e/a)+"m":e>=t?Math.round(e/t)+"s":e+"ms"}function o(e){return s(e,u,"day")||s(e,c,"hour")||s(e,a,"minute")||s(e,t,"second")||e+" ms"}function s(e,r,n){if(!(e<r))return e<1.5*r?Math.floor(e/r)+" "+n:Math.ceil(e/r)+" "+n+" s"}var t=1e3,a=60*t,c=60*a,u=24*c,i=365.25*u;e.exports=function(e,s){return s=s||{},("string"==typeof e?r(e):s["long"]?o(e):n(e))},t=r(s),a=Object.freeze({"default":t}),c=n(function(e,n){function o(){return n.colors[f++%n.colors.length]}function s(e){function r(){}}function s(){var e=s,r=+new Date,t=r-(l||r);e.diff=t,e.prev=l,e.curr=r,l=r,null==e.useColors&&(e.useColors=n.useColors()),null==e.color&&e.useColors&&(e.color=o());var a=Array.prototype.slice.call(arguments);a[0]=n.coerce(a[0]),"string"!=typeof a[0]&&(a=["%o"].concat(a))
```

AL Formatter

AL Formatter

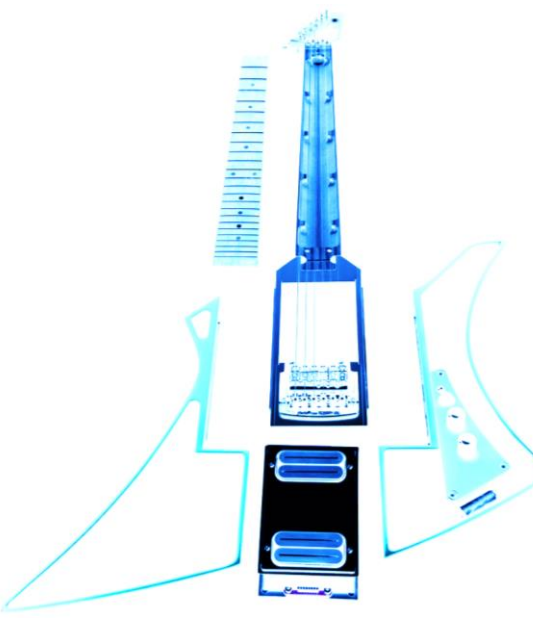


By: Rasmus Aaen

Features

- Indentation
- Keyword case style
- Sort variable definitions
- Readability Guidelines - Spacing and newlines (experimental)

Alt+Shift+f → formats the document



A man with dark hair, wearing a grey shirt, a brown and orange argyle vest, and dark trousers, stands in a classroom. He has his hands on his hips and a serious expression. He is looking down at a group of children sitting at their desks. The children are wearing school uniforms. The classroom has a whiteboard, a bulletin board with many small photos, and large windows with vertical blinds. The text "AL Lint" is overlaid in the center of the image.

AL Lint

AL Lint

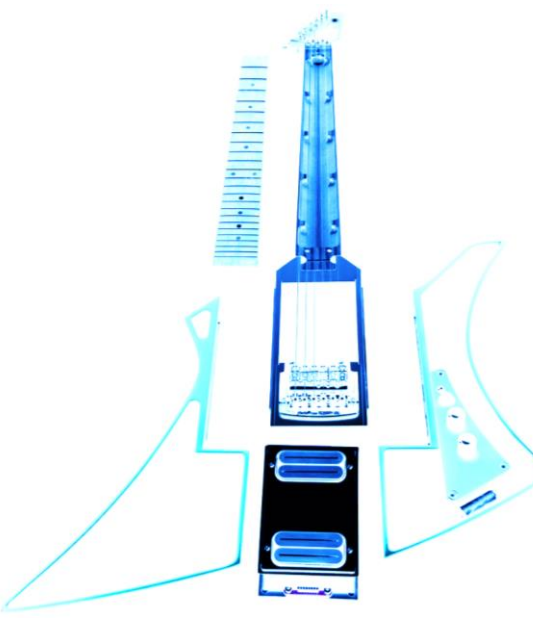


By: Mark Brummel – NAV Skills

A “linter”, which flags suspicious code.

Features

- Refactor: moves selected code to function
- Clean Code: check current doc for coding guidelines, like
 - Hungarian Notation
 - Unused Variables
 - ...
- Status bar
 - Current procedure name
 - Maintainability Index
 - Cyclomatic Complexity



CRS AI Language Extension



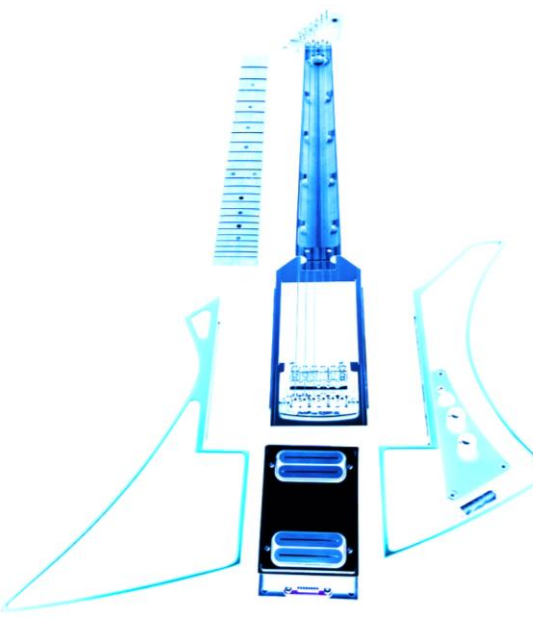
CRS AI Language Extension



By: me

Features:

- Install Waldo's PowerShell Modules
- Run Object
 - In Web Client
 - In tablet Client
 - In Phone Client
 - In Windows Client
- Organize:
 - Rename file(s)
 - Reorganize files(s)

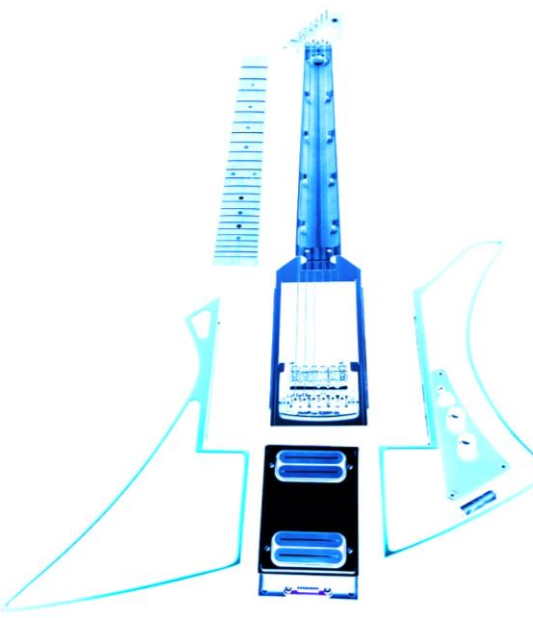


How to contribute

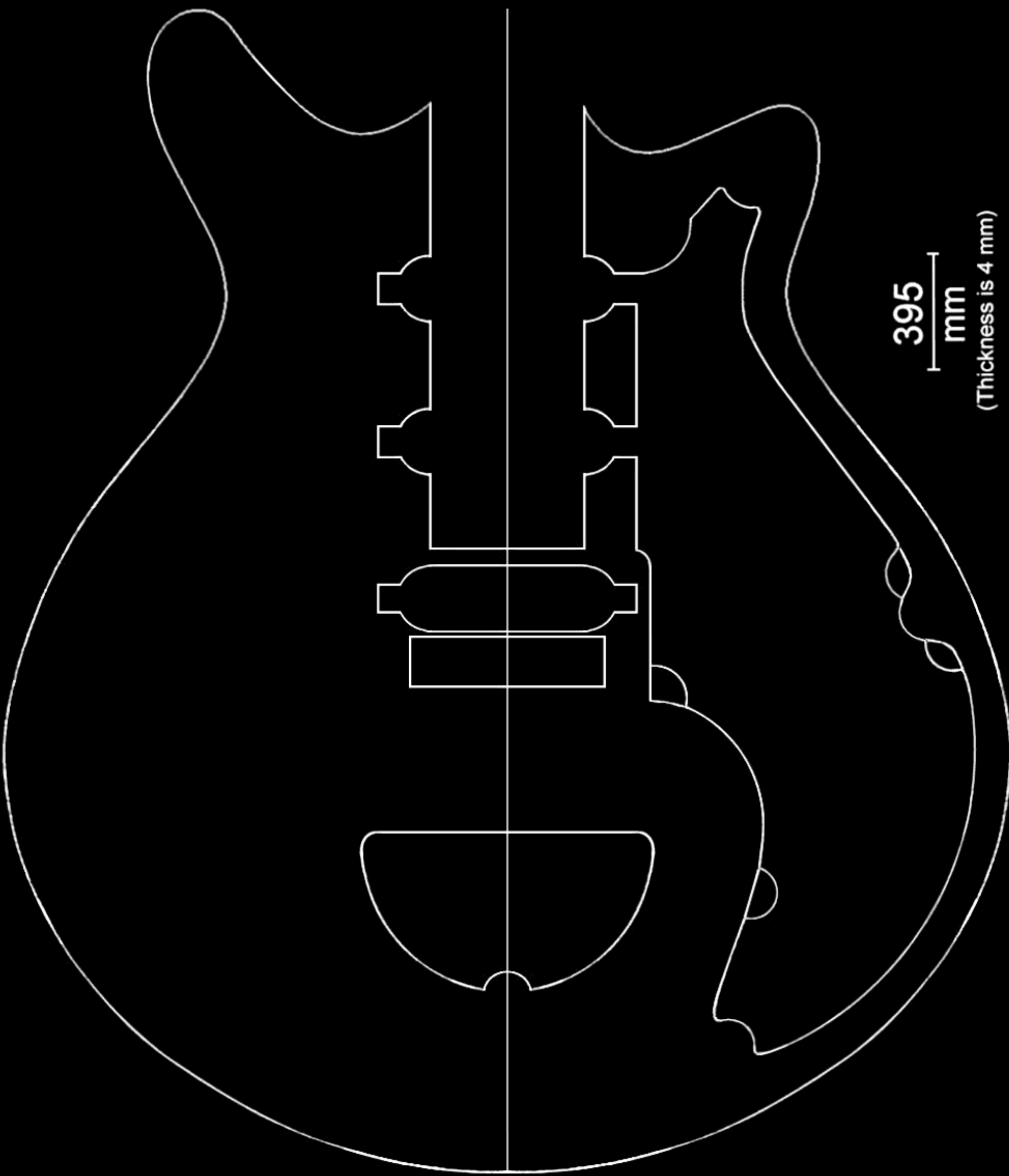
Lots (read: all) of these Extensions are free

Lots of the have their code shared on Github (or any other public repository)

Give feedback!



Creating your own VSCode Extension



Getting started – Node.js

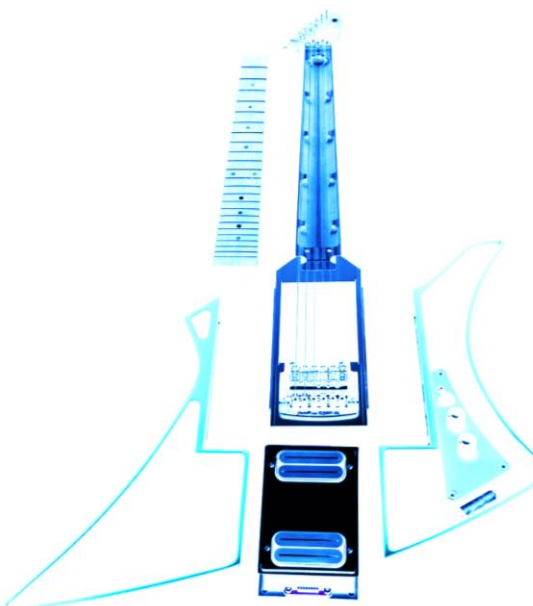


Node.js

- Platform for building fast and scalable server applications using JavaScript
- Node.js is the runtime
- NPM is the package manager for Node.js modules

Install:

<https://nodejs.org/en/download/>



Getting started - Yeoman

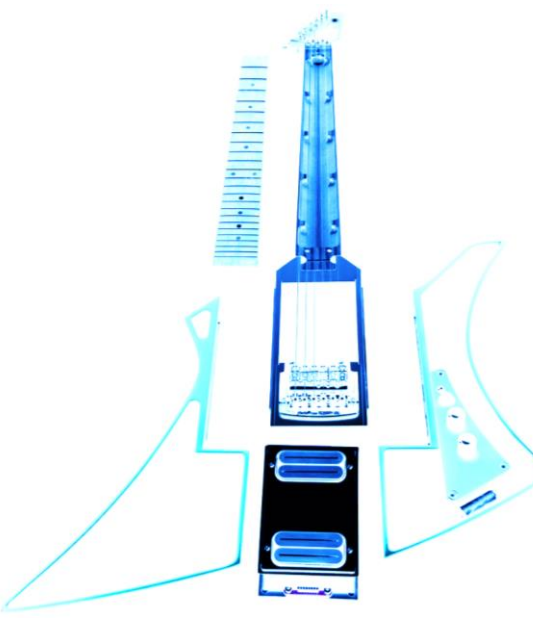


Yeoman

- Generic scaffolding system – allows rapidly getting started on new projects
- “kind of” a code generator
- Based on Yeoman: [vscode-generator-code](https://github.com/yeoman-generator-code)

Install:

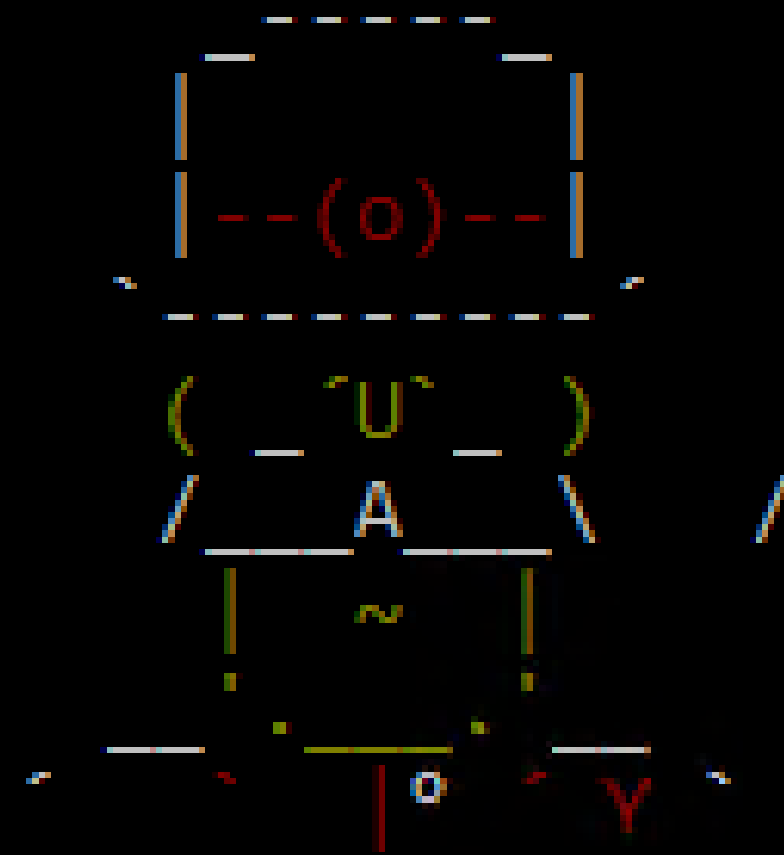
```
Npm install -g yo generator-code
```



Getting started – Yo Code



```
C:\Users\Administrator>yo code
```

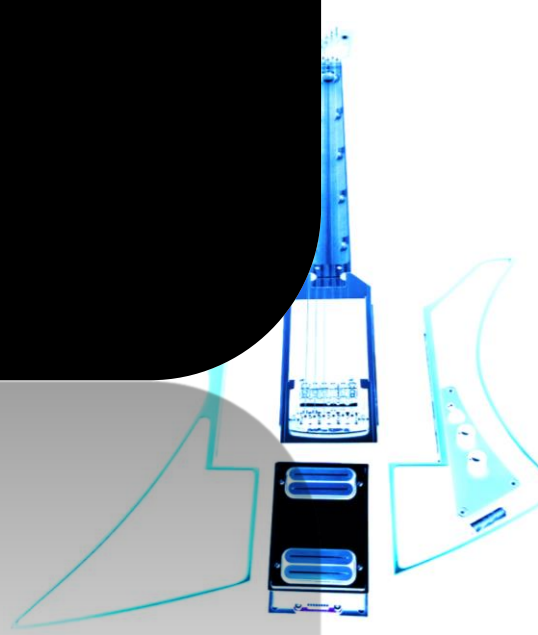


Welcome to the Visual
Studio Code Extension
generator!

```
? What type of extension do you want to create? (Use arrow keys)
> New Extension (TypeScript)
  New Extension (JavaScript)
  New Color Theme
  New Language Support
  New Code Snippets
  New Extension Pack
```

NEW EXTENSION BACK

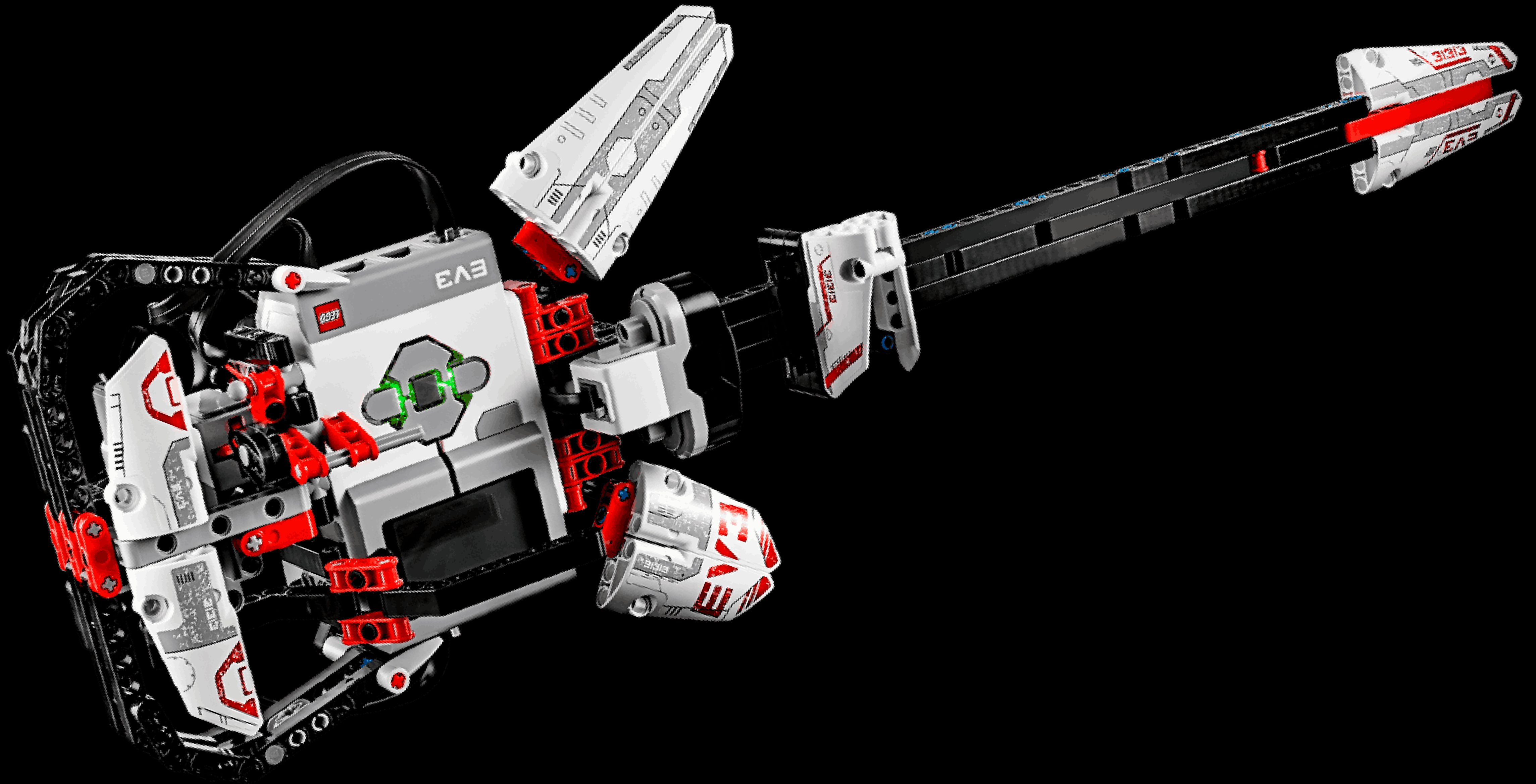
NEW CODE SNIPPETS



Build our own VSCode extension

NAV
TECH
DAYS
2017

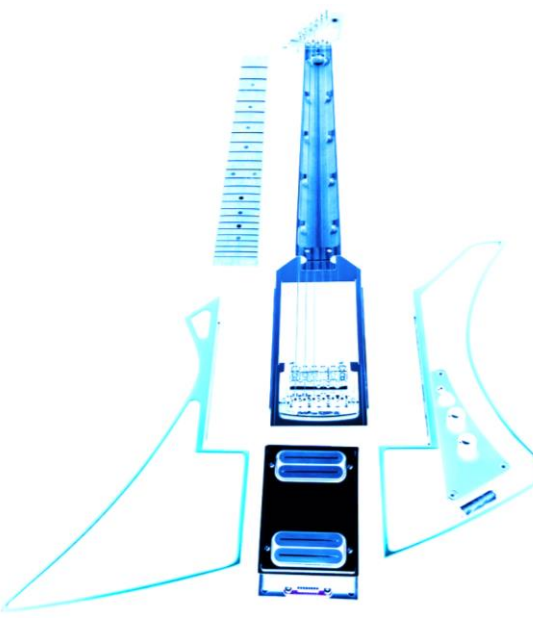
mibuso.com



The Basics

Readme.md

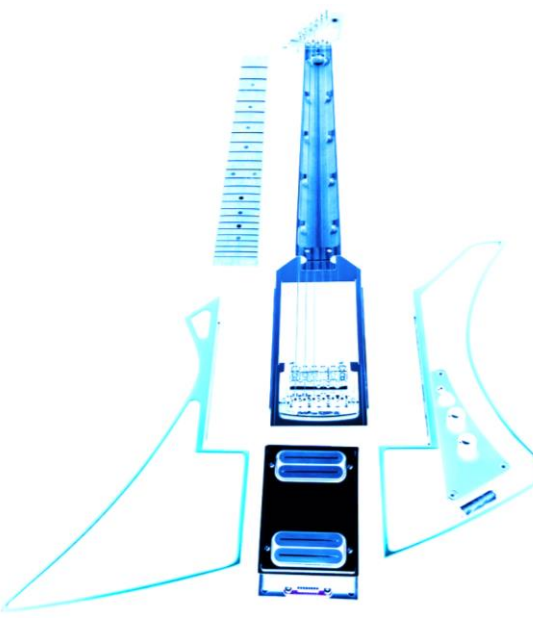
- Markdown (.md)
- Description of your Extension – ends up on the marketplace!
- Should include:
 - Features
 - Commands
 - Snippets
 - ..
 - Requirements
 - Settings
 - Release notes



The Basics


Package.json

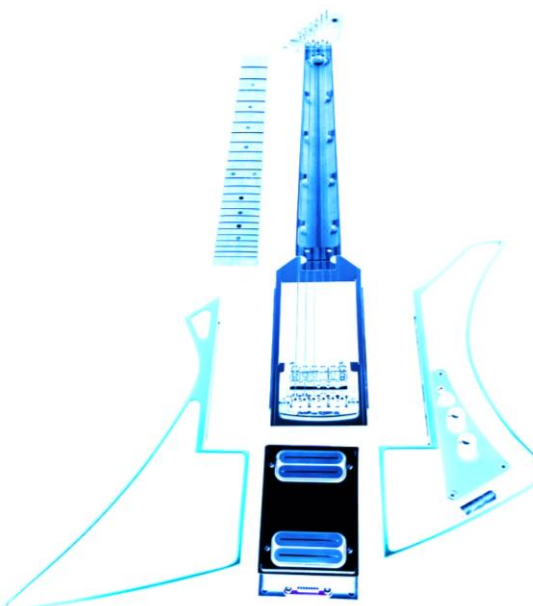
- Manifest
- Description of your extension in readable metadata for other extensions, compiler, vsce, ...
 - Name, Discription, Publisher, Version, ...
- ActivationEvents
- Contributes
 - Commands
 - Snippets
 - Colors
 - Debuggers
 - ...
- Dependencies
 - If the module is necessary for the extension to work
- Devdependencies
 - If modules is only used for development (test, check code style, ...)



The Basics

Source

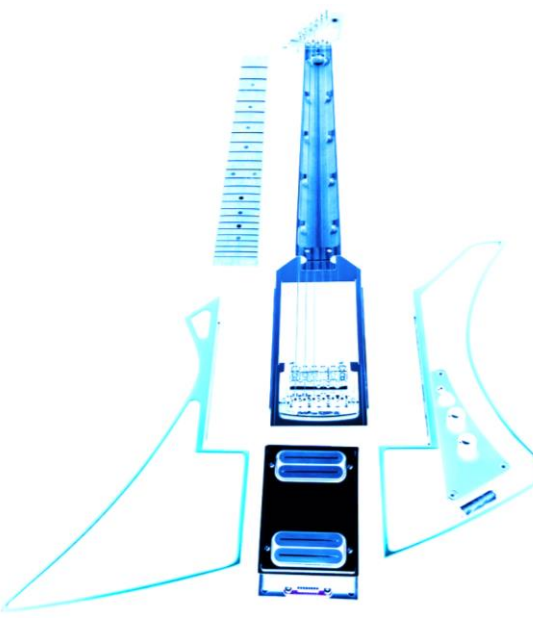
- src-directory
- extension.ts 
 - Exported “activate”-function -> invoked by VSCode (once)
 - The code for your new commands



The Basics

Out

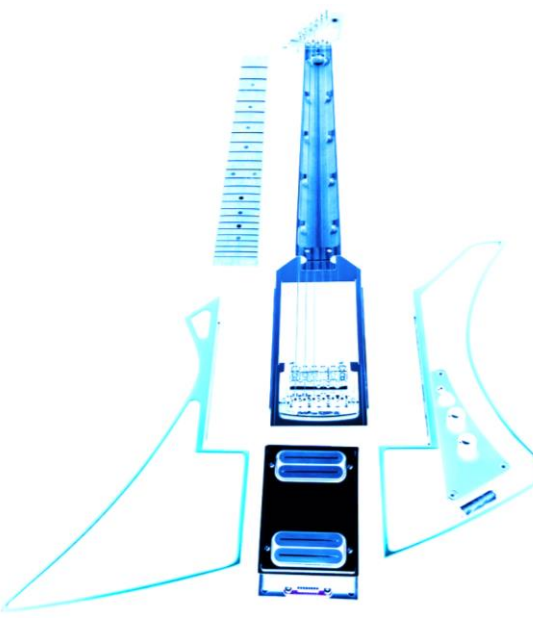
- Compiled JavaScript
- Should be excluded from .git



The Basics

node_modules

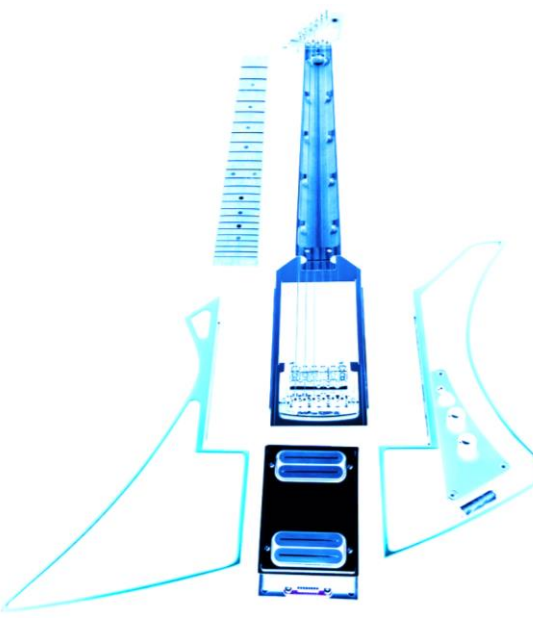
- Local modules for this extension
- Libraries of functionality that you can use during development
- New libraries can be added (by “npm install ..”)



Publish your extension

Make it available on the marketplace!

vsce



My Extension

crs-al-language-extension



What?

Extension for al development, to make your life more convenient.

Why?

- To make your life more convenient
- To get used to VSCode Extension Development.

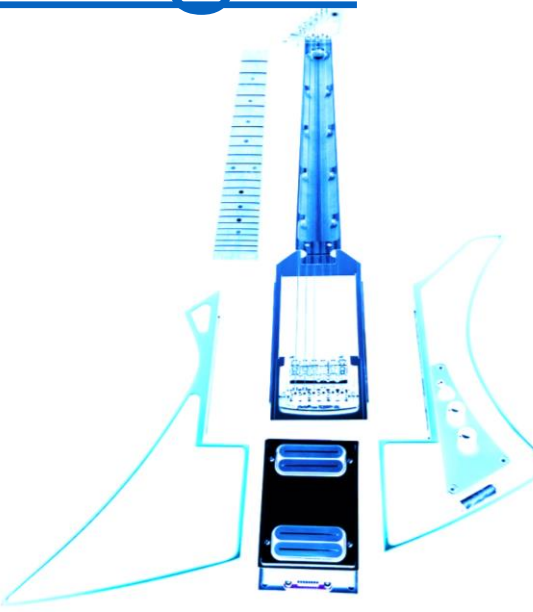
Where?

- On the marketplace:

<https://marketplace.visualstudio.com/items?itemName=waldo.crs-al-language-extension>

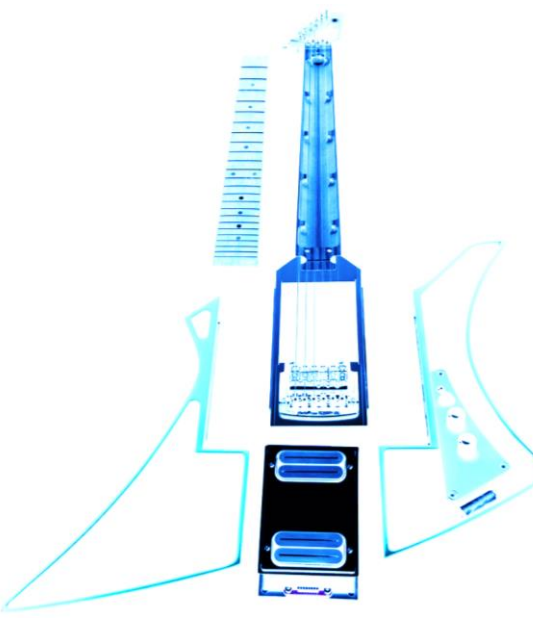
- On github

<https://github.com/cloudreadysoftware/crs-al-language-extension>

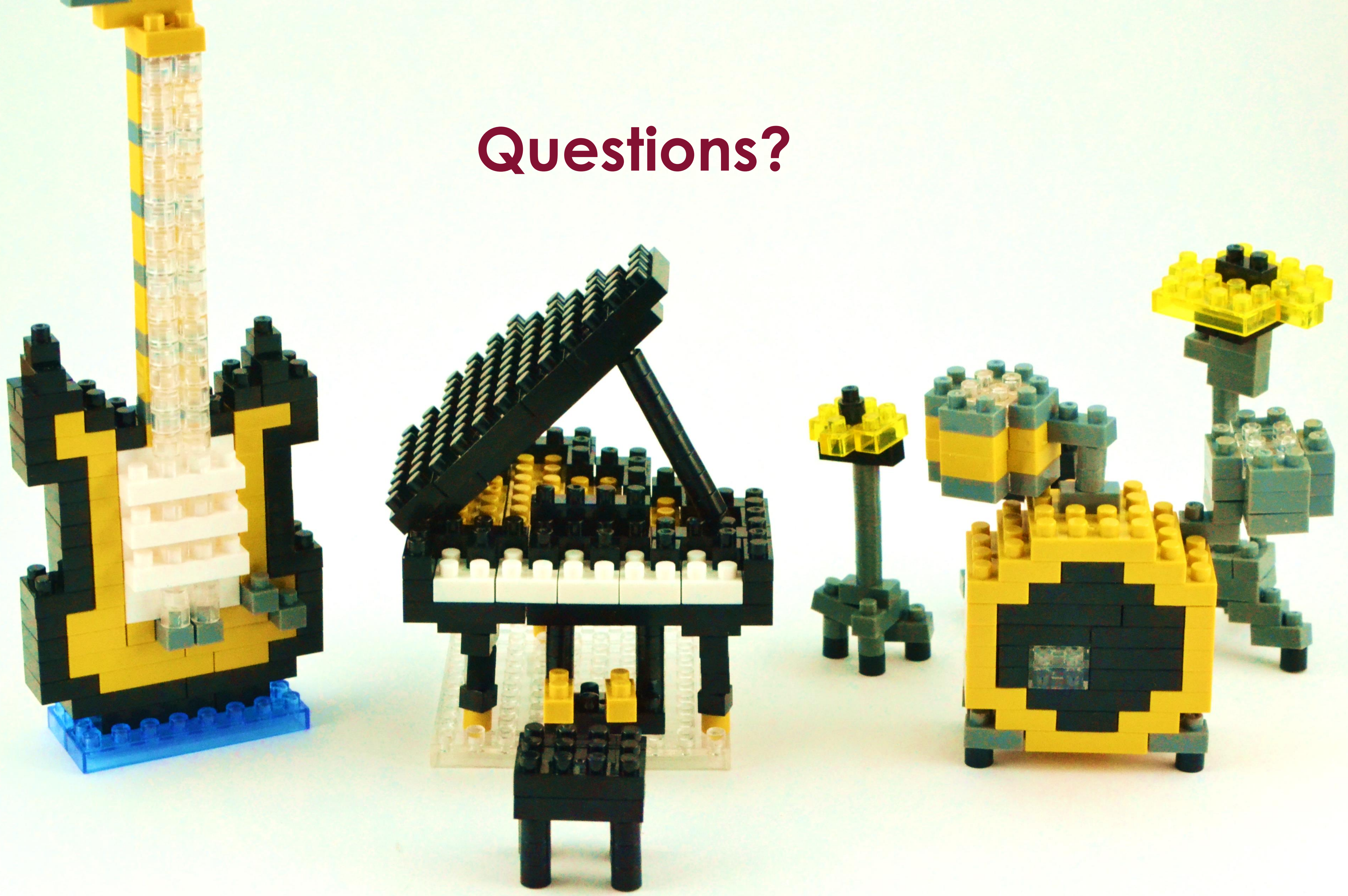


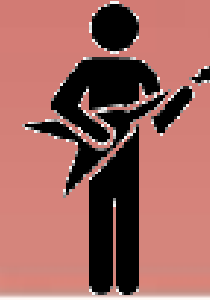
Some AI Code Specifics

- Reading settings
 - Configuration
 - Launch.json
 - App.json
- Execute PowerShell (thank you, Jonas)
- Work with files in your workspace
- Get object properties from .al files
- Work with directories and files
 - Rename, move, ...
- Open URL (thank you, Tobias)
- NAV Urls for all client types
- VSCode-specifics
 - Confirm/Input/Message-box
 - QuickpickItems for NAV Objects
 - ...
- ..



Questions?





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THANK YOU!



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