



COSMO CONSULT  
Business-Software für Menschen

# Visual Studio Code

Introduction



## Prerequisite

- Use Workshop-VM / Workshop-Computer  
*follow the instructions of the Boarding Pass*
- Additional Material  
*inside the [WORKSHOP] Folder*



Visual Studio Code

<https://code.visualstudio.com>

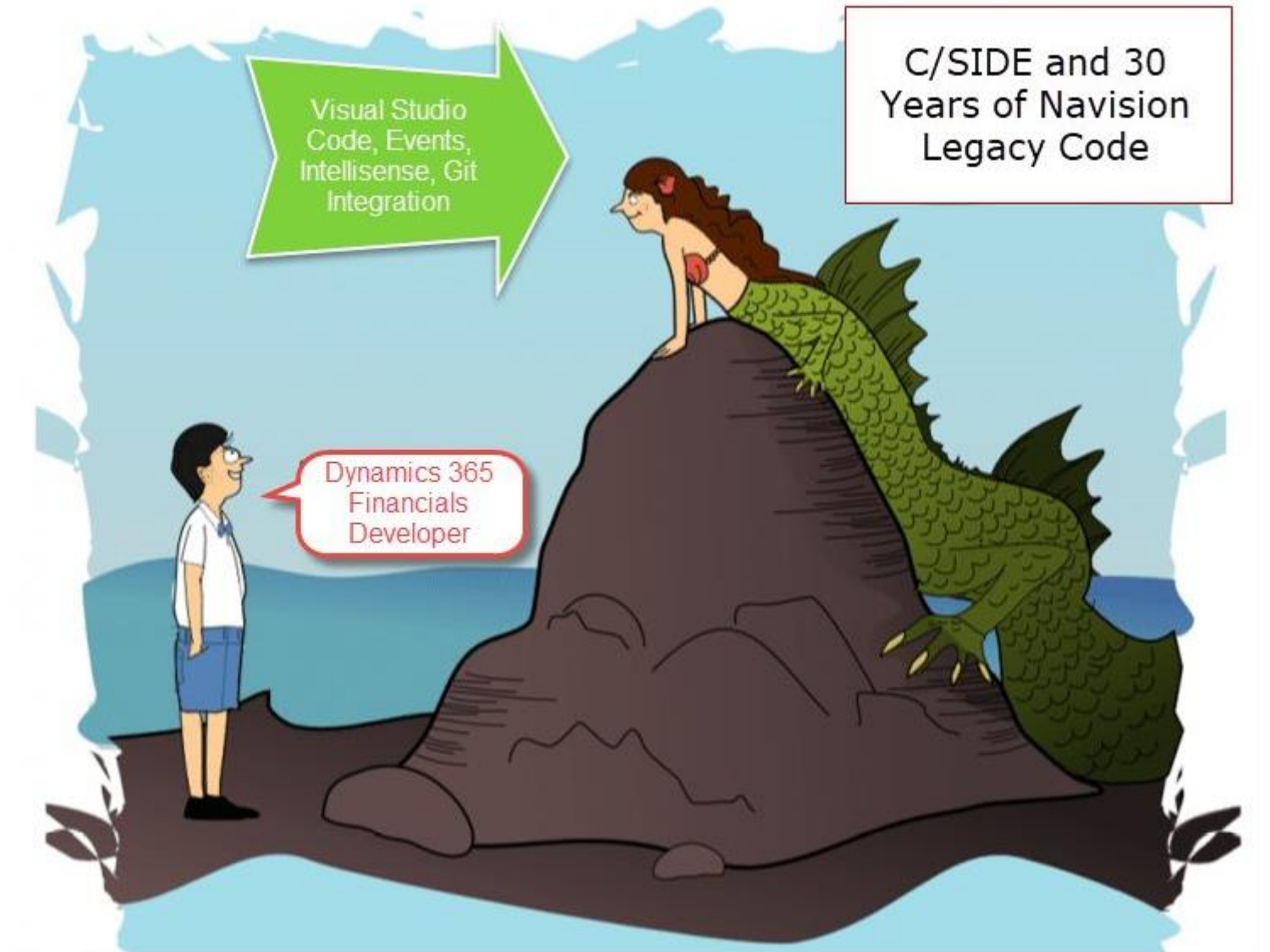


Competence Team DevTech

[Microsoft AI](#)

# Agenda

- 1 Visual Studio Code
- 2 Prepare the NST
- 3 Getting Started with AL
- 4 The cool stuff of VS Code
- 5 Q & A





# Visual Studio Code



- User Interface
- Extend & Configure VS Code

# Visual Studio Code

## ➤ Activity Bar

- Search
- Explorer
- Debug
- GIT
- VS Code Extensions

## ➤ Side Bar

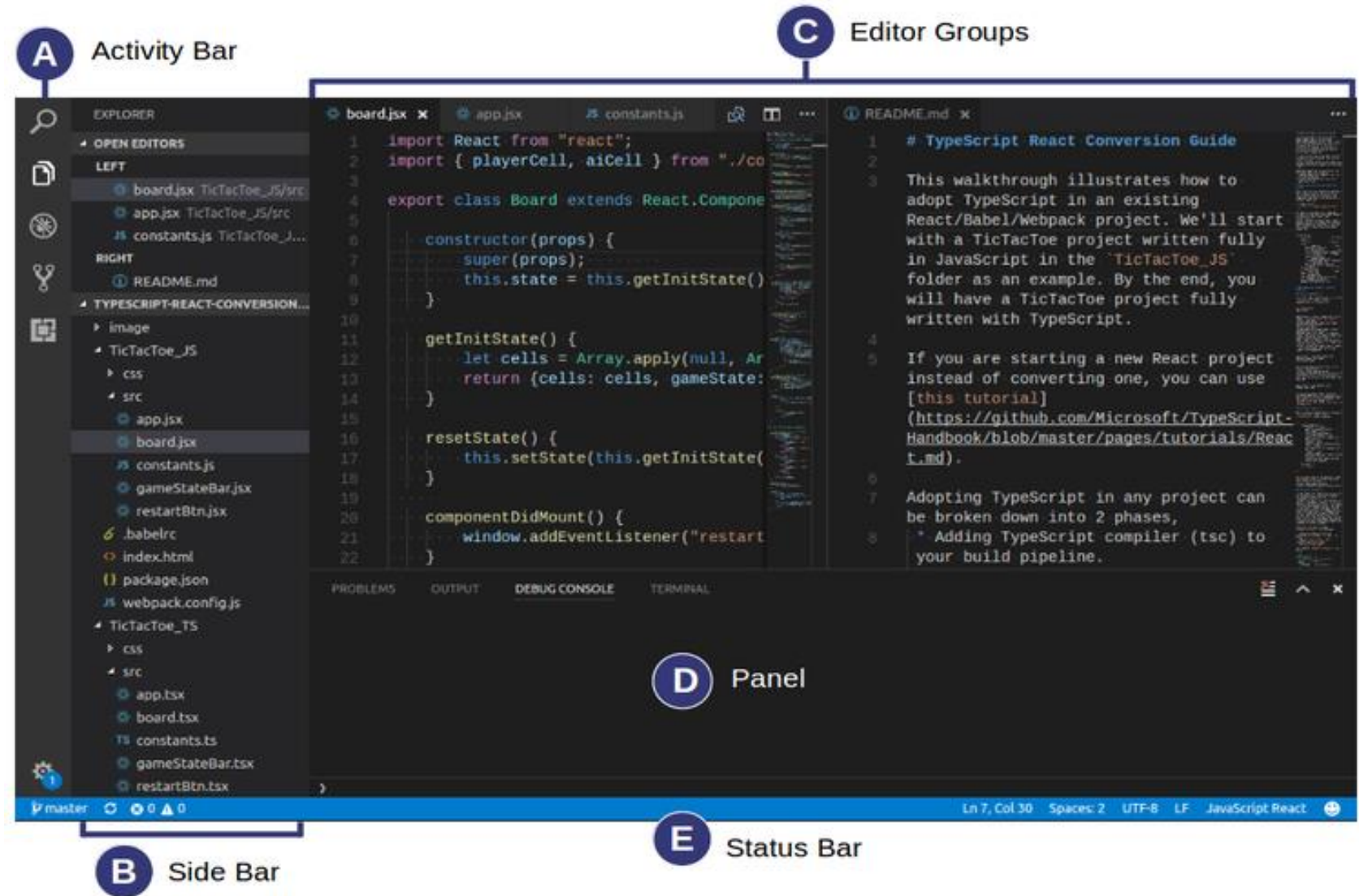
- Branch
- Errors & Warnings

## ➤ Editor Groups

## ➤ Panel

- Output
- Console (PowerShell)

## ➤ Status Bar



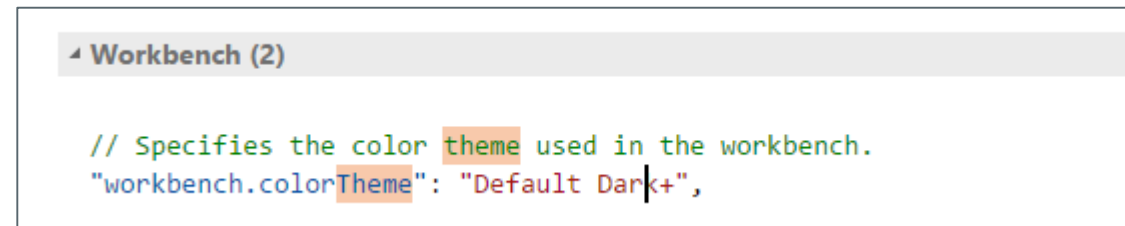
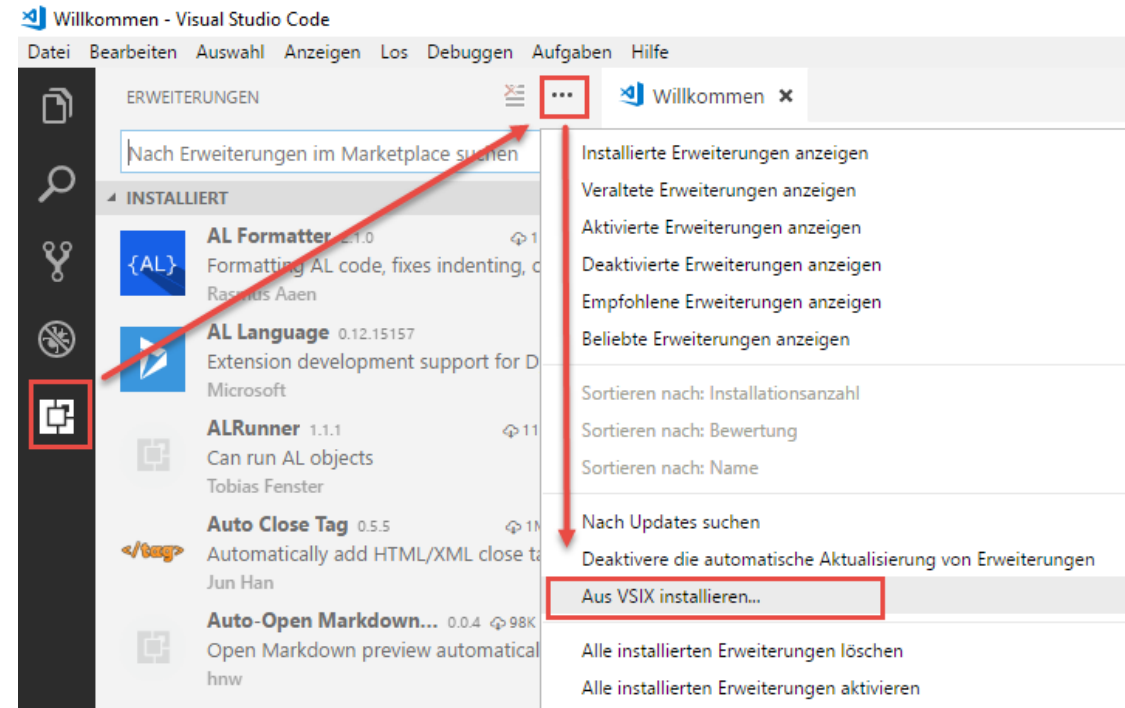
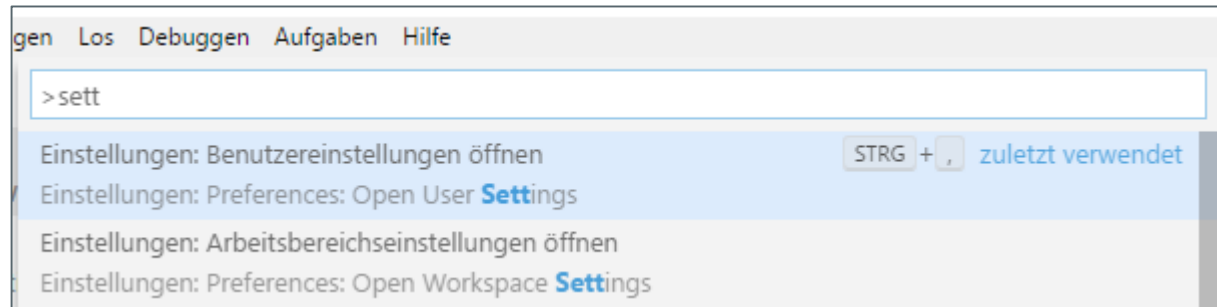
# VS Code - Extensions & Settings

## ➤ Extensions

- Microsoft AL (VSIX / Marketplace)
- Markdown

## ➤ Settings

- Default
- User
- Workspace



# AL Language Settings

## ➤ Package Directory

- al.packageCachePath
- al.enableCodeAnalysis

### ▸ AL Language extension configuration (6)

```
// Path to Editor Services host executable.
"al.editorServicesPath": "bin/",

// Sets the logging verbosity level for the AL Language Editor Services host executable.
Possible values are 'Verbose', 'Normal', 'Warning', and 'Error'
"al.editorServicesLogLevel": "Normal",

// Sets the directory path where reference symbol packages are located
"al.packageCachePath": "./.alpackages",

// Specifies whether the code analysis should be performed for all source files in the
opened folder
"al.enableCodeAnalysis": false,

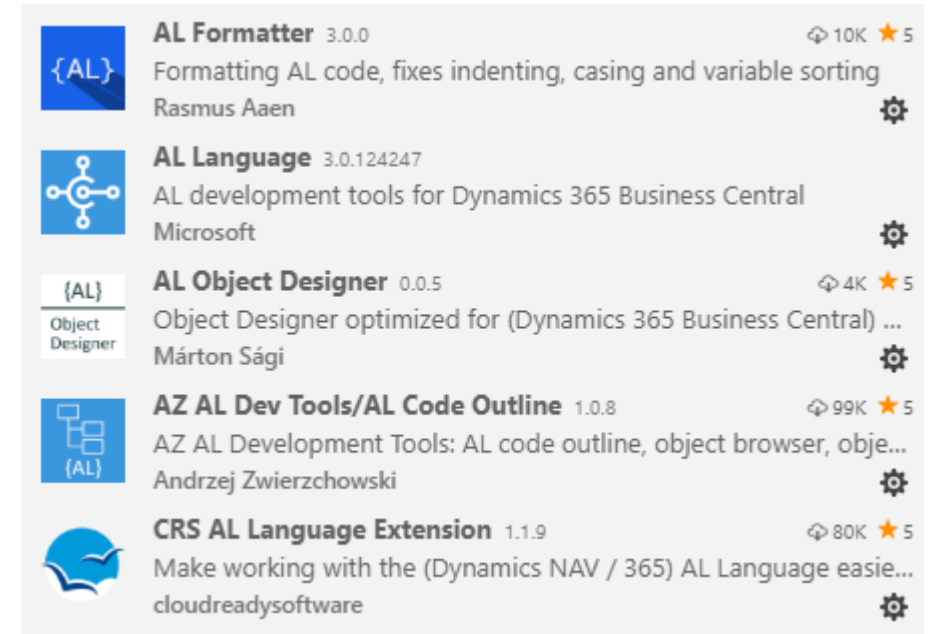
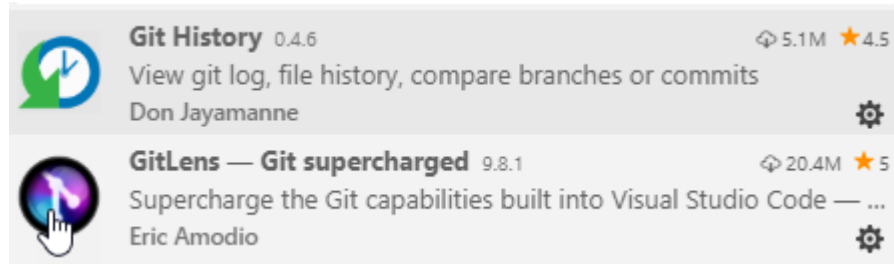
//
"al.env": "",

//
"al.debug": false,
```

# Hands On!

## ➤ Start VS Code & Install some extensions

- Microsoft AL (from .vsix)
- Insert Guid
- AL: Formatter, Object Designer, Outline, CRS Language Extension
- Git History & Git Lens



## ➤ Modify VS Code settings

- Switch the theme of your VS Code to e.g. “White”



# NAV 2018 Business Central



➤ Get Ready for Development!



# NAV Configuration / Development Settings

## ➤ Specify the Customization Level

- „Allowed Extension Target Level“  
(Internal, Solution, Extension, Personalization)

## ➤ Connect VS Code & Debugger

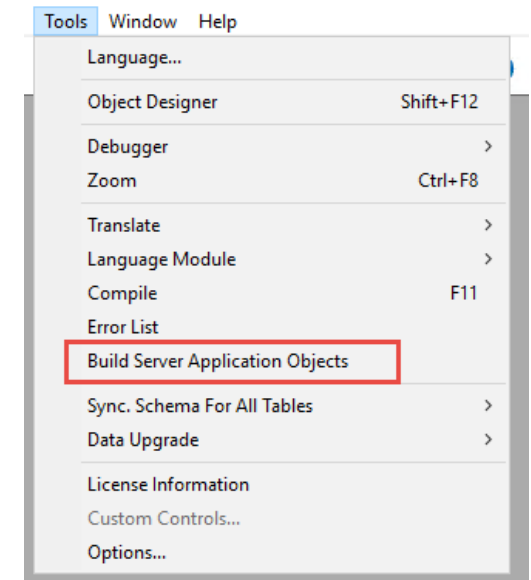
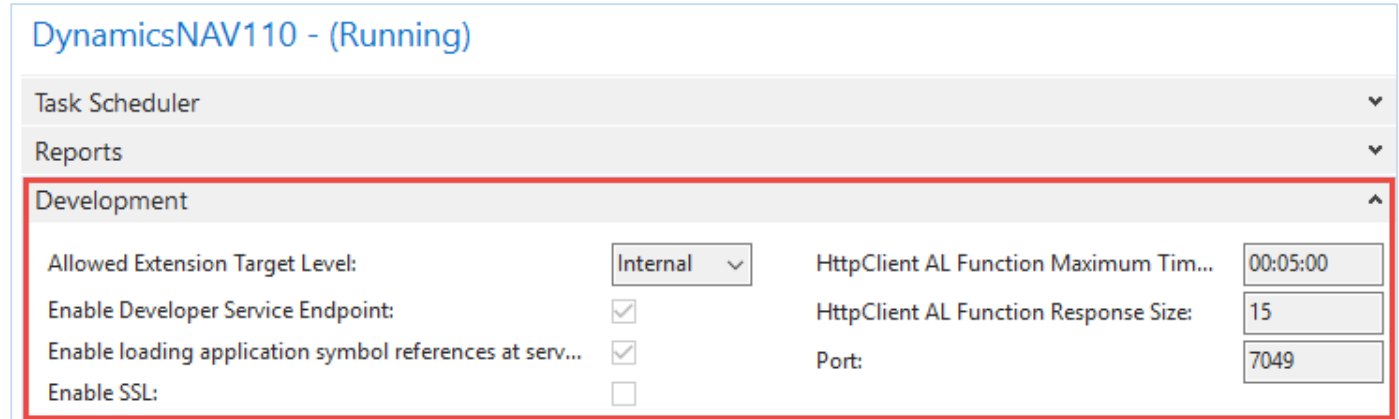
- Enable Developer Service Endpoint
- Port

## ➤ Running C/Side & AL Side-by-Side

- „Loading application Symbol References at startup“
- finsql.exe **generatesymbolreference=yes**

## ➤ Changing NST Configuration:

- NST-Admin Center
- CustomSettings.config



## Microsoft AL



- Which files you should know?
- My first Project – Your first challenge!

# Getting Started with AL

## ➤ Project - Folder

- `./` → *Root-Folder* = Workspace of the Project
- `.vscode` → Workspace related information
- `.git` → All necessary information for your project in version control **Git**
- `.alpackages` → Folder for Symbols

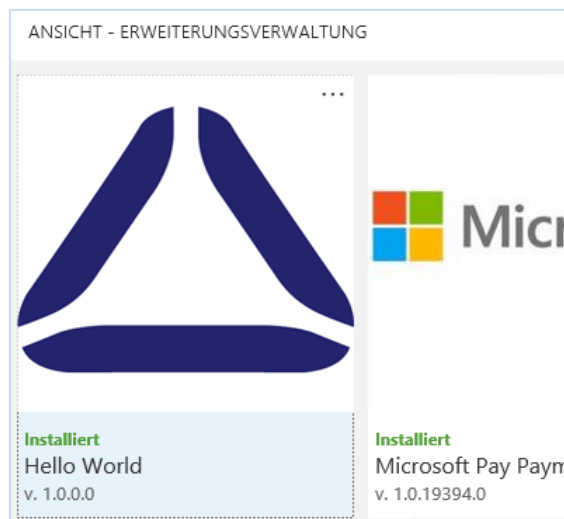
## ➤ Project - Files

- `.vscode/launch.json` → Deployment / Launch-Configuration
- `./app.json` → Application Manifest
- `./Readme.md` → Documentation File in Markdown Format



# app.json

- Application Manifest Information
  - ID
  - Name
  - Publisher
  - Version
- Dependencies to other Apps
- Platform / Application
- Target
  - Personalization, Extension, Solution, Internal  
→ Access-Level for the project
- ID Range
- Features
  - XLIFF Translation File
- showMyCode



```
1 {
2   "id": "1bf0feea-882f-49fd-8f93-d9c514636370",
3   "name": "Hello World",
4   "publisher": "COSMO CONSULT Dresden GmbH",
5   "brief": "best 'Hello World' ever",
6   "description": "The best 'Hello World' you have ever seen!",
7   "version": "1.0.0.0",
8   "compatibilityId": "1.0.0.0",
9   "privacyStatement": "",
10  "EULA": "",
11  "help": "",
12  "url": "http://www.cosmoconsult.com",
13  "logo": "../logo/cc_logo_512x512.png",
14  "capabilities": [],
15  "dependencies": [
16    {
17      "appId": "22222222-3333-4444-5555-666666666666",
18      "name": "Any Other Module",
19      "version": "1.0.0.0",
20      "publisher": "COSMO CONSULT GmbH"
21    }
22  ],
23  "screenshots": [],
24  "platform": "11.0.0.0",
25  "application": "11.0.0.0",
26  "target": "Internal",
27  "idRange": {
28    "from": 50100,
29    "to": 50149
30  },
31  "features": "TranslationFile",
32  "showMyCode": false
33 }
```

# launch.json

- Enable the Developer Service Endpoint
  - ➔ NST
- Specify the Developer Endpoint
  - Name
  - Server (*no port number here*)
  - Server Instance
  - Port & Debug Server ➔ default Ports 7049 / 4711
  - Authentication ➔ UserPassword | Windows | AAD
  - Schema Update Mode ➔ **Synchronize** | Recreate | ForceSync
  - *Startup Object Id*
  - *Startup Object Type* ➔ Page | Table
  - breakOnRecordWrite
  - breakOnError
  - launchBrowser

```
launch.json x
1 {
2     "version": "0.2.0",
3     "configurations": [
4         {
5             "type": "al",
6             "request": "launch",
7             "name": "LOCAL-NST",
8             "server": "http://localhost",
9             "serverInstance": "nav",
10            "authentication": "Windows",
11            "startupObjectType": "Page",
12            "startupObjectId": 22,
13            "schemaUpdateMode": "Synchronize",
14            "debugServer": 4711,
15            "port": 7049,
16            "skipServerCertificateCheck": true
17        }
18    ]
19 }
```

Development	
Allowed Extension Target Level:	Internal
Enable Developer Service Endpoint:	<input checked="" type="checkbox"/>
Enable loading application symbol references at serv...	<input checked="" type="checkbox"/>
Enable SSL:	<input type="checkbox"/>
HttpClient AL Function Maximum Tim...	00:05:00
HttpClient AL Function Response Size:	15
Port:	7049

# Symbols

➤ Folder `./alpackages`

➤ Packed JSON

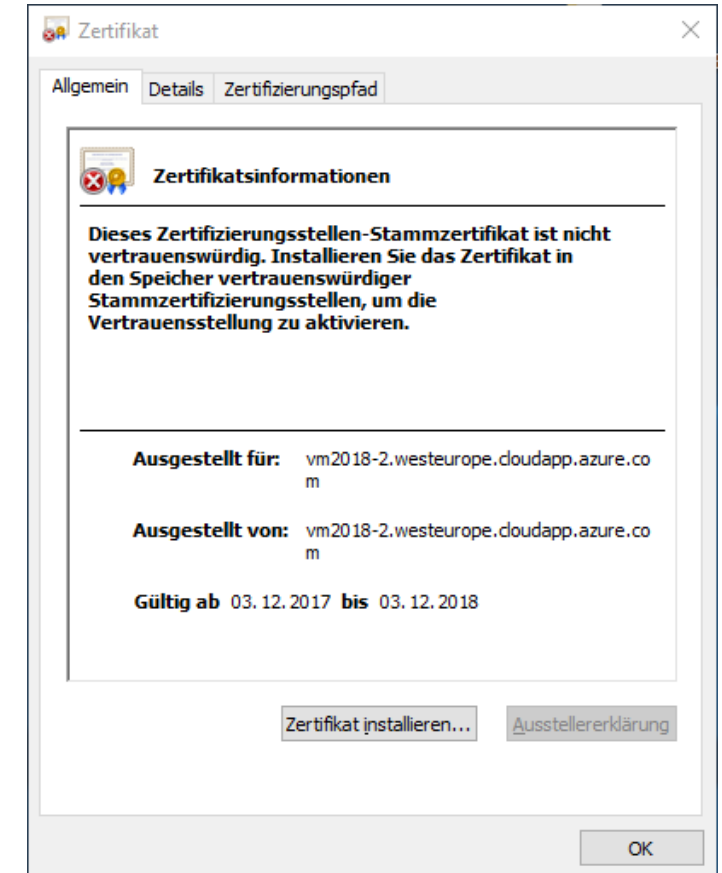
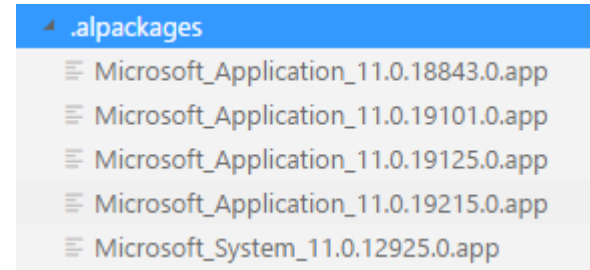
- Interface of each accessible Object in NAV
- Pages, Tables, Fields, Events, ...

➤ Symbols

- Microsoft\_Application → Current Symbols of [C/Side] NAV
- Microsoft\_System → Symbols of NAV Version

➤ Download Symbols

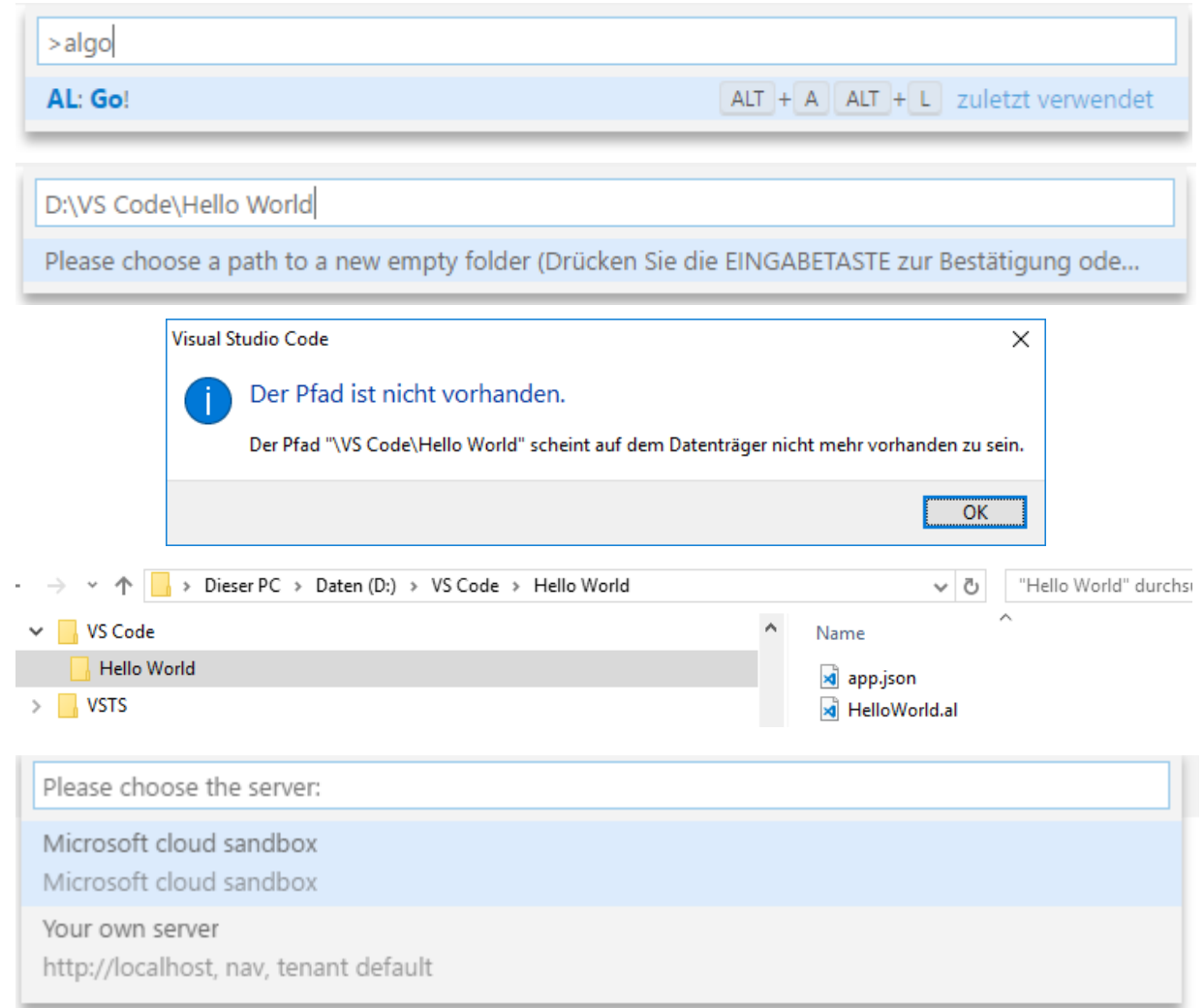
- [Ctrl + Shift + P] + „Download Symbols“



[2017-12-07 14:02:24.64] Error: Fehler beim Senden der Anforderung.  
Die zugrunde liegende Verbindung wurde geschlossen: Für den geschützten SSL/TLS-Kanal konnte keine Vertrauensstellung hergestellt werden..  
Das Remotezertifikat ist laut Validierungsverfahren ungültig.

# My first AL Project

- [Ctrl + Shift + P] ... AL: Go!
  - Generate an AL project with necessary files
  - Select a Folder 😊
  - Choose the Server for config
- Project Content
  - ./vscode/launch.json
  - ./app.json
  - ./Hello World.al
- Download Symbols
- Compile, Deploy & Start





# Hands On!

## ➤ Hallo World

- Create a Microsoft AL Project  
*„Hello World“*
- Configure your app.json  
*Publisher, Logo, Description, ...*
- Configure your launch.json  
*Server, Authentication, ServiceInstance, Tenant, Port, ...*
- Deploy the Code

## ➤ Debug the „Hello World“

- Assign a BreakPoint
- Inspect the „Rec“



## Visual Studio Code Features



- Short Cuts
- Debugger
- Snippets



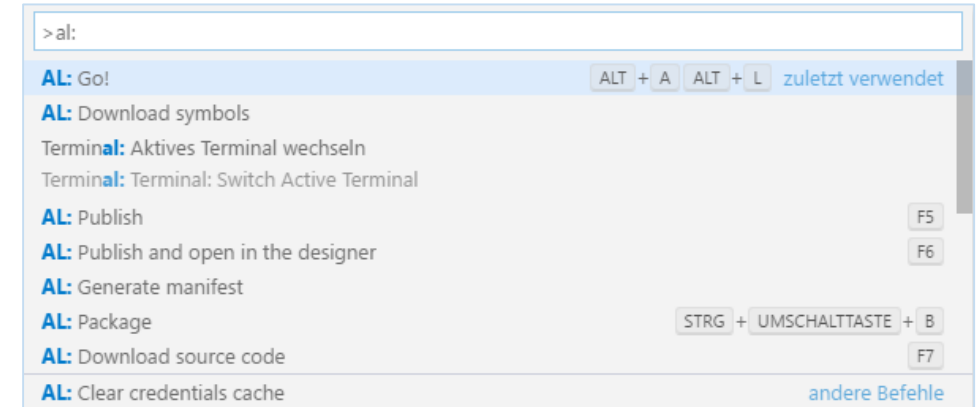
# Important Commands

## ➤ VS Code Commands [Ctrl + Shift + P] or [F1]

- AL: Go! [Alt + A] & [Alt + L]
- AL: Download Symbols
- AL: Package
- AL: Download Source Code
- AL: Publish
- Keyboard Shortcuts [Ctrl + K] & [Ctrl + S]

## ➤ Editor Commands

- [F2] ... **Rename** Object / Property / ...
- [F12] ... Goto **Definition**
- [Ctrl + F12] ... Goto **Implementation**
- [Shift + F12] ... Show **Where** the reference is **Used**
- [Ctrl + B] ... Compile / Build
- [F5] ... Publish and Start
- [Ctrl + F5] ... Publish without Debug
- [ALT + Shift] ... Block Edit



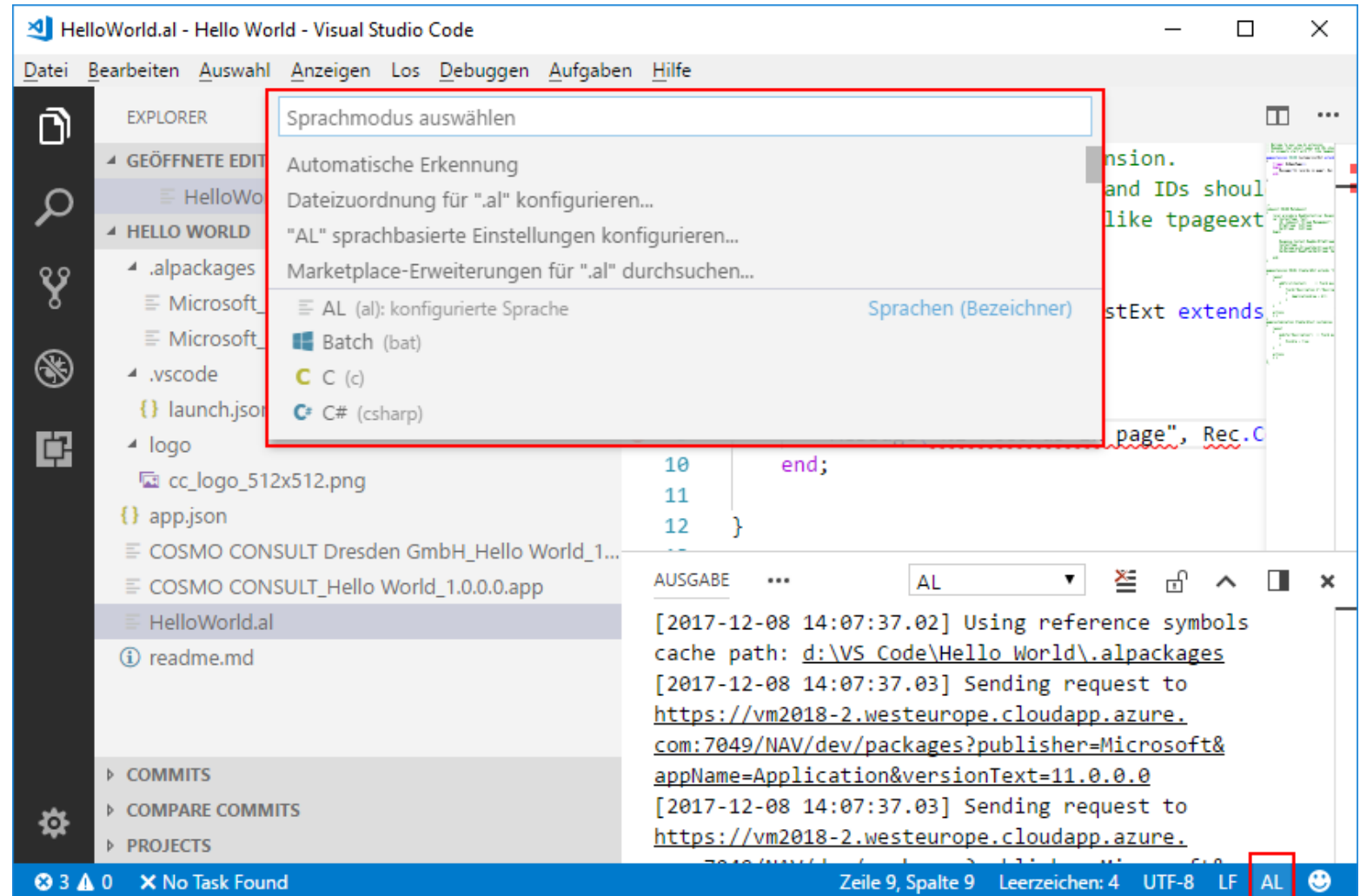
Gehe zu Definition	F12
Peek-Definition	Alt+F12
Alle Verweise suchen	Shift+F12
Symbol umbenennen	F2
Alle Vorkommen ändern	Ctrl+F2
Dokument formatieren	Alt+Shift+F

Debugging starten	F5
Ohne Debugging starten	Ctrl+F5
Debugging beenden	Shift+F5
Debugging erneut starten	Ctrl+Shift+F5
Konfigurationen öffnen	
Konfiguration hinzufügen...	
Prozedurschritt	F10
Einzelanschritt	F11
Rücksprung	Shift+F11
Fortfahren	F5
Haltepunkt umschalten	F9
Neuer Haltepunkt	
Alle Haltepunkte aktivieren	
Alle Haltepunkte deaktivieren	
Alle Haltepunkte entfernen	
Zusätzliche Debugger installieren...	

# Syntax Highlighting

## ➤ Change Language Mode

- [Ctrl + K] & [M]
- Status Bar





# Debugger

## > Common Tasks

- > Break Points [F9]
- > Start Debugging [F5]

## > Features

- > Conditional Break Points
- > Inspect Variables
- > Debug C/Side Code  
(from Event Subscribers)  
→ Generated AL

The screenshot displays the Visual Studio Code interface for debugging SAP AL code. The main editor shows the 'HelloWorld.al' file with the following code:

```
1 // Welcome to your new AL extension.
2 // Remember that object names and IDs should be unique across all extensions.
3 // AL snippets start with t*, like tpageext - give them a try and happy coding!
4
5 0 references
6 pageextension 50100 CustomerListExt extends "Customer List"
7 {
8     trigger OnOpenPage();
9     begin
10         Message('Hallo COSMO!');
11     end;
12
13     trigger OnAfterGetCurrRecord();
14     begin
15         Message('%1 records in page', Rec.Count);
16     end;
17 }
18
```

The left sidebar shows the 'VARIABLEN' (Variables) pane with the following structure:

- VARIABLEN
  - Globals
    - Rec: '01121212'
    - xRec: ''
  - Locals
- ÜBERWACHEN (Watch)
  - Rec.Name: 'Spotsmeyer's Furni...
  - Rec."No.": '01121212'

A right-hand pane shows the details of the 'Rec.' object, including fields like 'No.', 'Name', 'Address', 'City', 'Contact', 'Phone No.', 'Telex No.', 'Document Sending Profile', 'Our Account No.', 'Territory Code', 'Global Dimension 1 Code', 'Global Dimension 2 Code', 'Chain Name', and 'Budgeted Amount'.

Below the main editor, a close-up shows the 'Ausdruck' (Expression) pane with the expression 'Rec.Count = 100' entered, indicating the current value of the 'Rec.Count' variable.

# Snippets

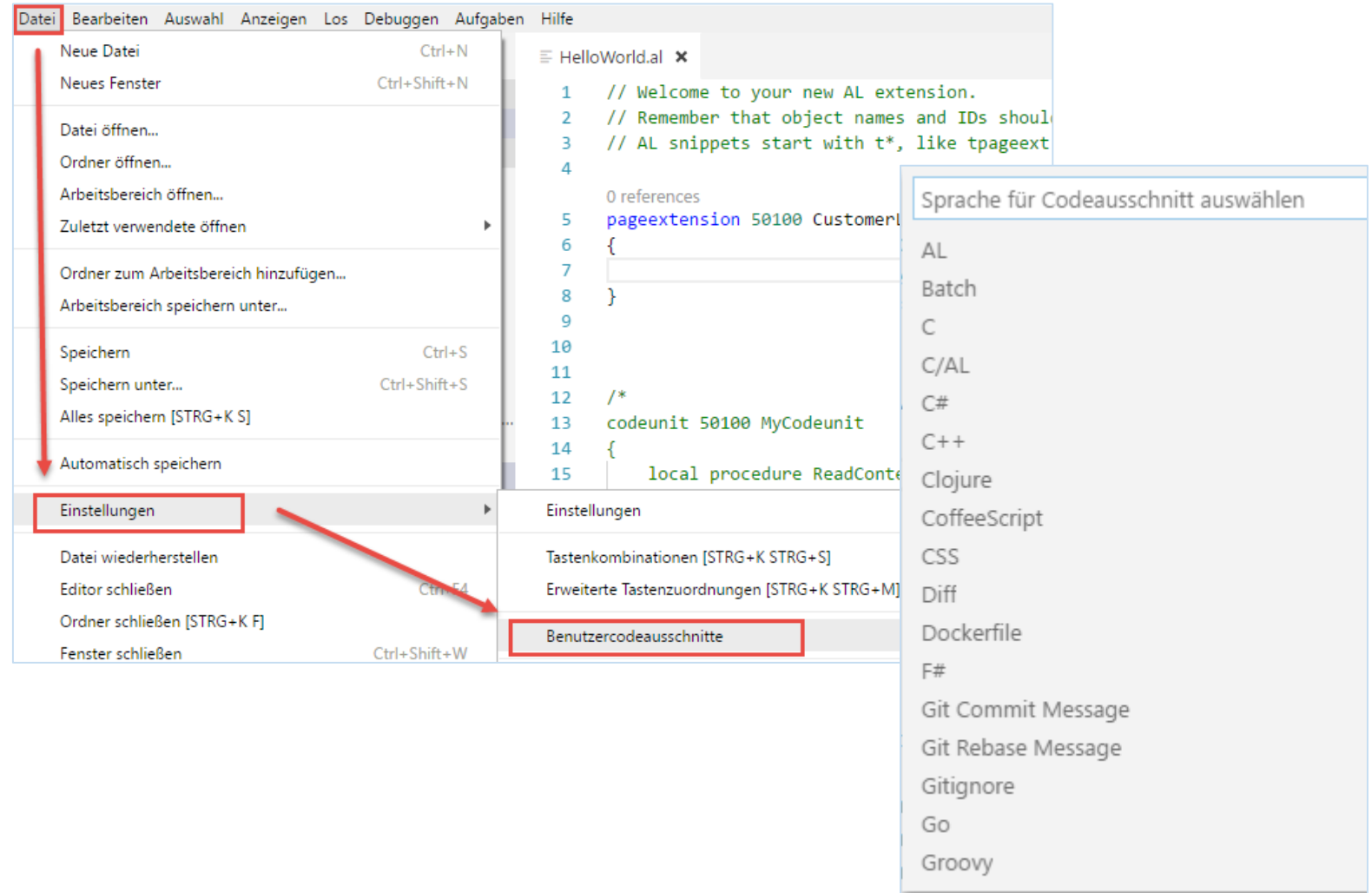
## ➤ Common Snippets (e.g. AL Language)

- `ttable`
- `tcodeunit`
- `tfieldtext`

## ➤ User Snippets

- File → Preferences
- `(languageId).json`

→ `al.json`



# User Snippets

## ➤ Snippet Name

## ➤ Description

## ➤ Body

### ➤ Array of Lines

## ➤ Parameters

### ➤ $\${<Index>}$

... User Input

### ➤ $\${1:param-name}$

... Name

### ➤ $\${2|Value 1,Value 2,Value 3|}$

... Name-List

### ➤ $\${<Index>}$

... Place Holder

```
"Function with filtered repeat - until": {
  "prefix": "mfuncrepeat",
  "description": "Function with a filtered repeat - until loop over a record variable.\n",
  "body": ["local procedure ${2:Repeat}${4:TableName}(${3:MyRecord}: Record ${4:TableName});",
  "begin",
  "\t${3}.${5|SetRange,SetFilter|}(${6:Field}, ${7:Value});",
  "\tif not ${3}.${8|FindSet(),Find('-'),Find('+')|} then",
  "\t\trepeat",
  "\t\t\t//Do something with ${3}",
  "\t\t\t${9}",
  "\t\tuntil ${3}.Next() = 0;",
  "end;"],
  "end;"}
},
```

mfuncrepeat

Function with a filtered repeat - until  
1 loop over a record variable.  
(Benutzercodeausschnitt)

```
local procedure RepeatTableName(MyRecord: Record TableName);
begin
  MyRecord.SetRange(Field, Value);
  if not MyRecord.FindSet() then
    repeat
      //Do something with MyRecord
    until MyRecord.Next() = 0;
end;
```

# Hands On!

## ➤ Debug the „Hello World“

- Assign a BreakPoint
- Inspect the „Rec“

## ➤ Create your own snippet

- Code:

```
if not MyRecord.FindSet() then  
  repeat  
    // Do something with MyRecord  
  
  until MyRecord.Next() = 0;
```

- Add a Parameter for “MyRecord”
- Add a Selection List for “FindSet()”:  
e.g.: FindSet(),Find('-'),Find('+')





## Q & A



*Visual Studio Code*

<https://code.visualstudio.com>



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