



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>

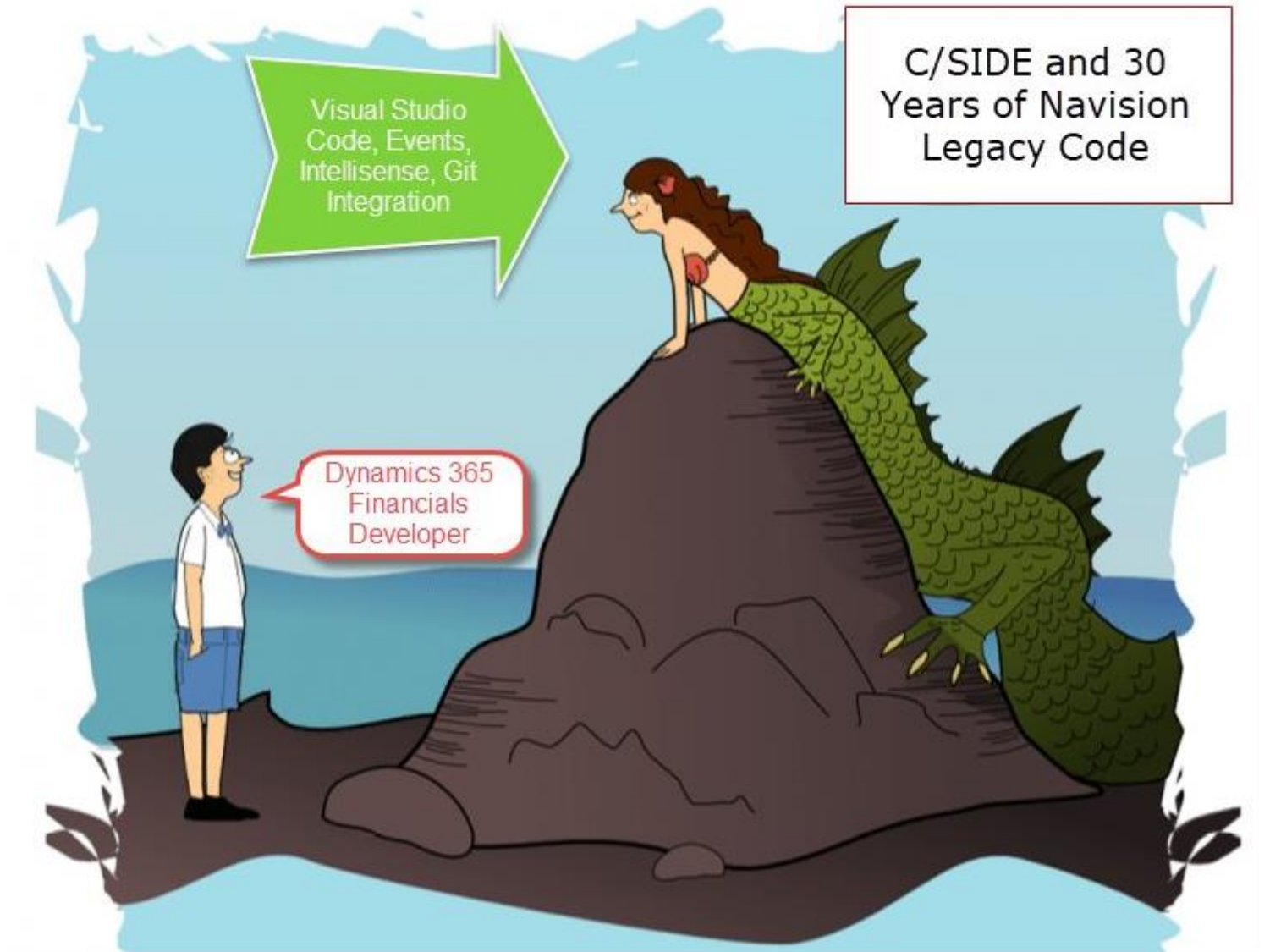


Competence Team DevTech

[Microsoft AL](#)

# 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

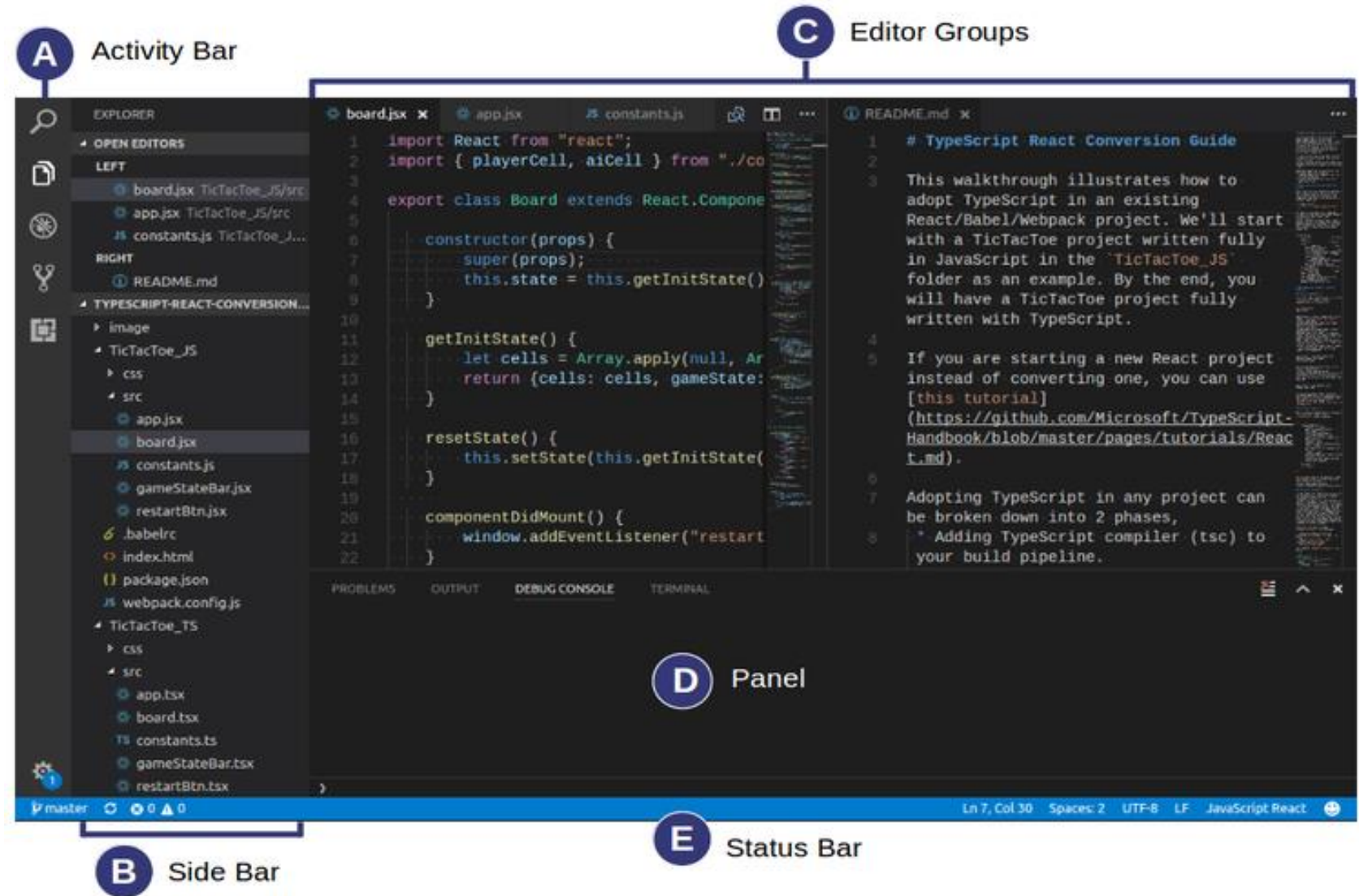
- Branch
- Errors & Warnings

## ➤ Editor Groups

## ➤ Panel

- Output
- Console (PowerShell)

## ➤ Status Bar



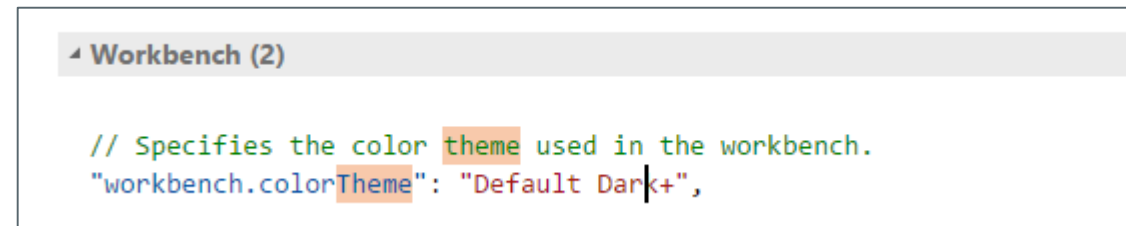
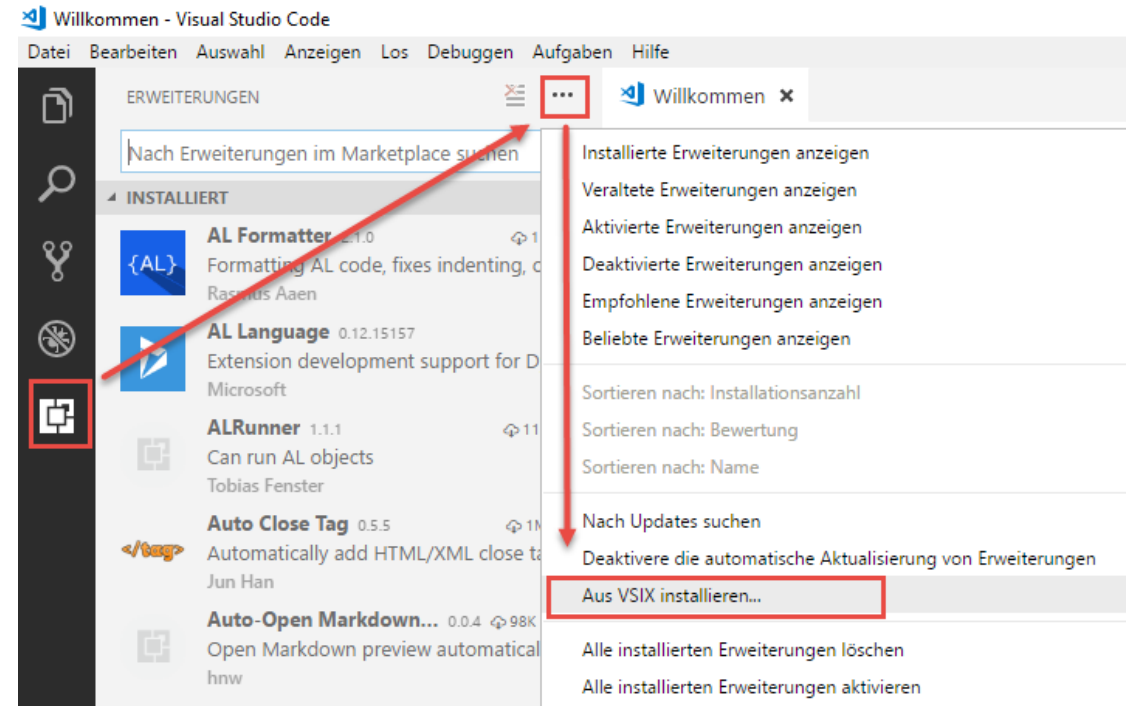
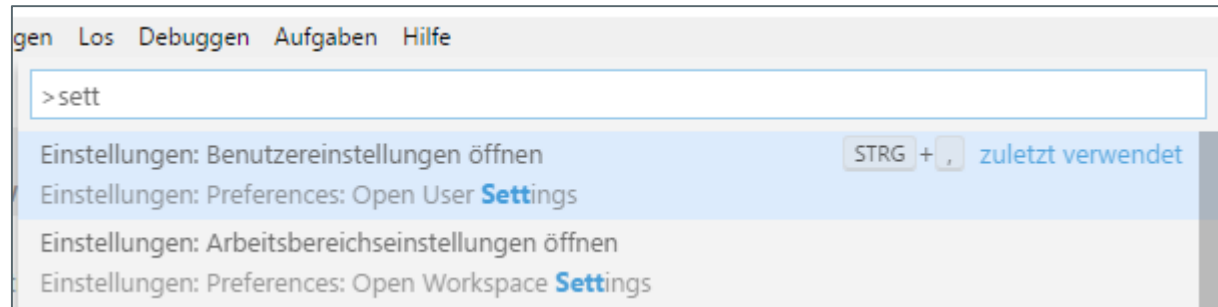
# VS Code - Extensions & Settings

## ➤ 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,
```

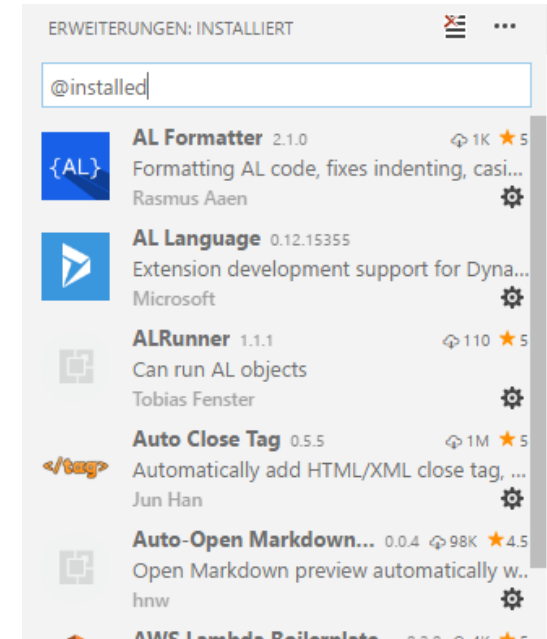
# Hands On!

## ➤ Start VS Code & Install some extensions

- Microsoft AL (from .vsix)
- AL Formatter
- JSON Syntax
- Markdownlint
- Auto-Open Markdown Preview
- MDTools

## ➤ Modify VS Code settings

- Switch the theme of your VS Code to e.g. "White"
- TurnOff Auto Format



```
// Steuert, ob der Editor Zeilen automatisch nach der Eingabe formatiert.  
"editor.formatOnType": false,  
  
// Steuert, ob der Editor den eingefügten Inhalt automatisch formatiert.  
"editor.formatOnPaste": false,  
  
// Hiermit wird eine Datei beim Speichern formatiert. Es muss ein Formatierer vorhanden  
sein, die Datei darf nicht automatisch gespeichert werden, und der Editor darf nicht  
geschlossen werden.  
"editor.formatOnSave": false,
```



# NAV 2018



➤ Get Ready for Development!



# NAV 2018 Configuration / Development Settings

## ➤ Specify the Customization Level

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

## ➤ Connect VS Code & Debugger

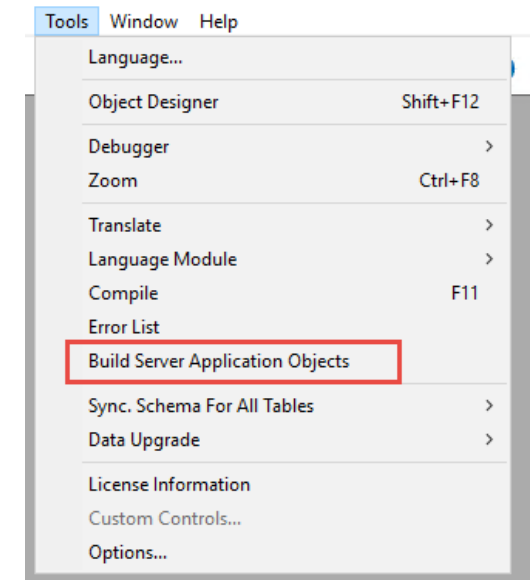
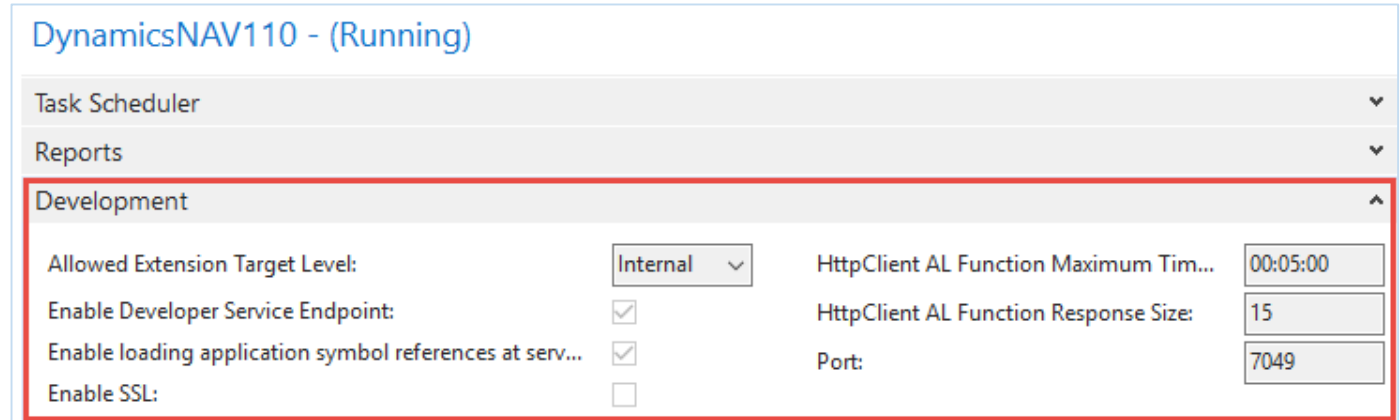
- Enable Developer Service Endpoint
- Port

## ➤ Running C/Side & AL Side-by-Side

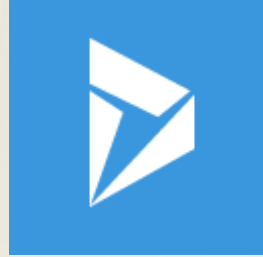
- „Loading application Symbol References at startup“
- finsql.exe **generatesymbolreference=yes**

## ➤ 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

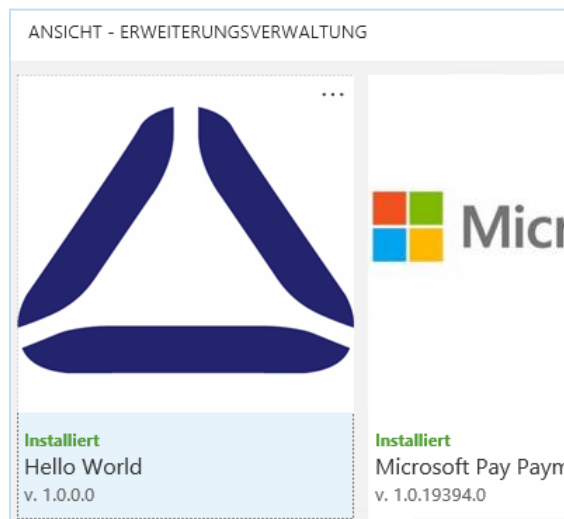
## ➤ Project - Files

- `.vscode/launch.sjon` → 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
  - *Startup Object Id*
  - *Startup Object Type* → Page | Table

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

# Symbols

➤ Folder `./alpackages`

➤ Packed JSON

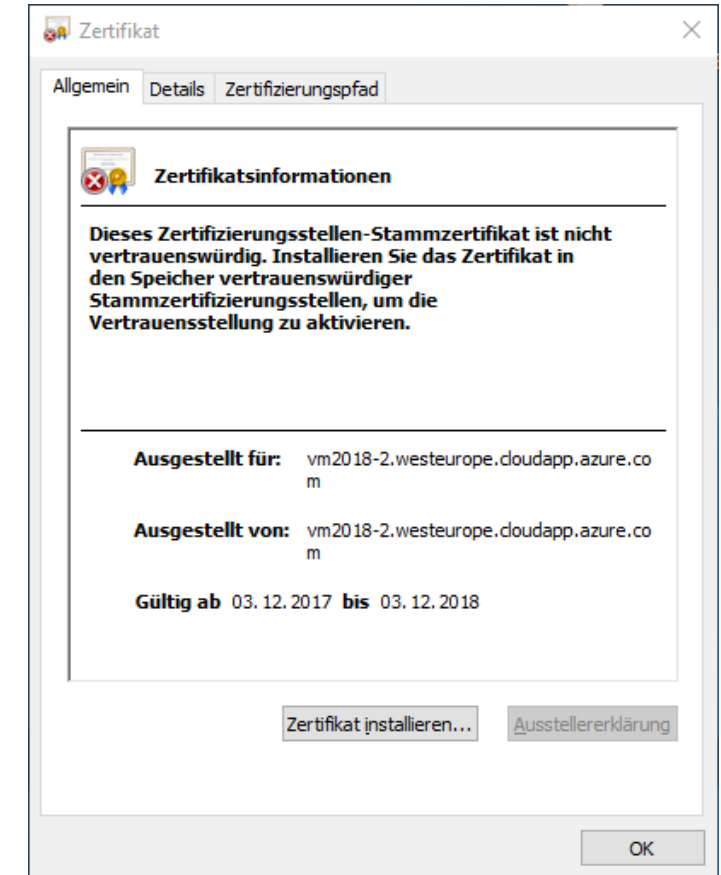
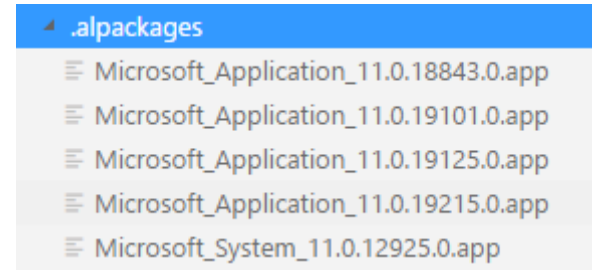
- Interface of each accessible Object in NAV
- Pages, Tables, Fields, Events, ...

➤ Symbols

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

➤ Download Symbols

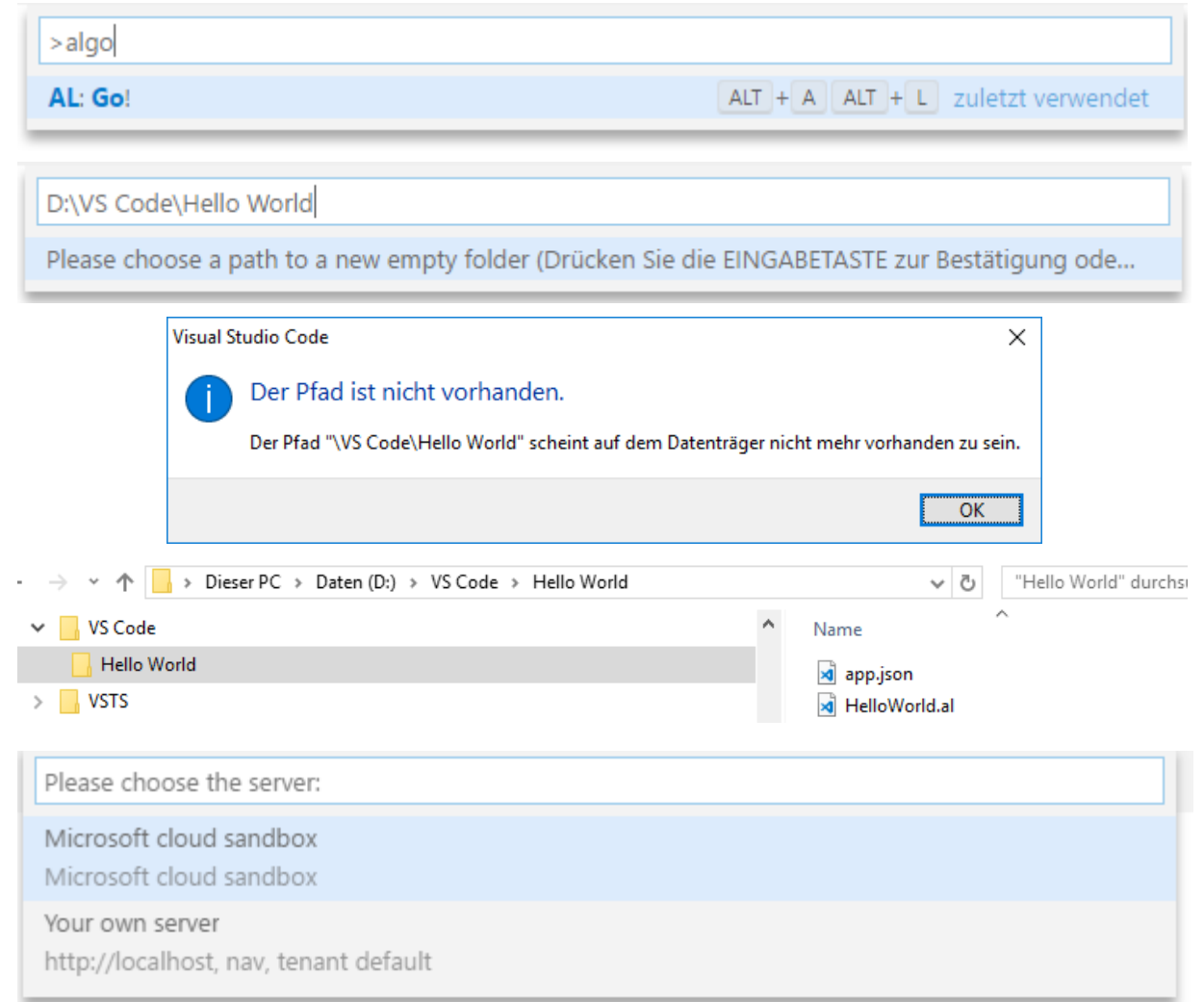
- [Ctrl + Shift + P] + „Download Symbols“



```
[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



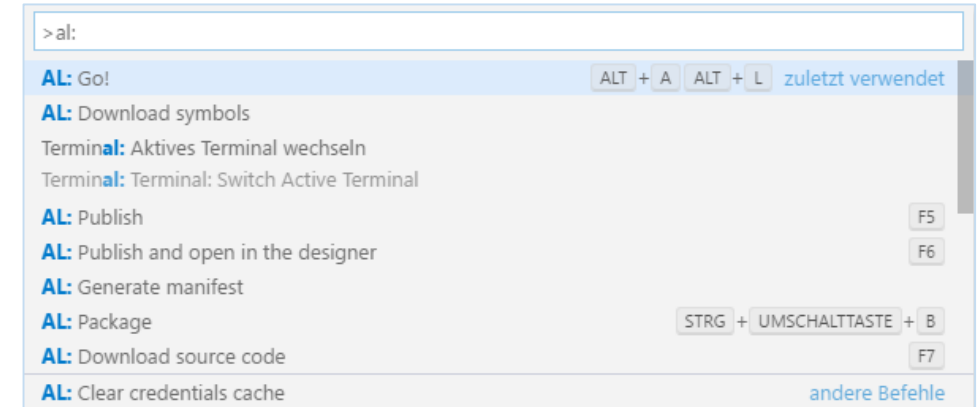
# Important Commands

## ➤ 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



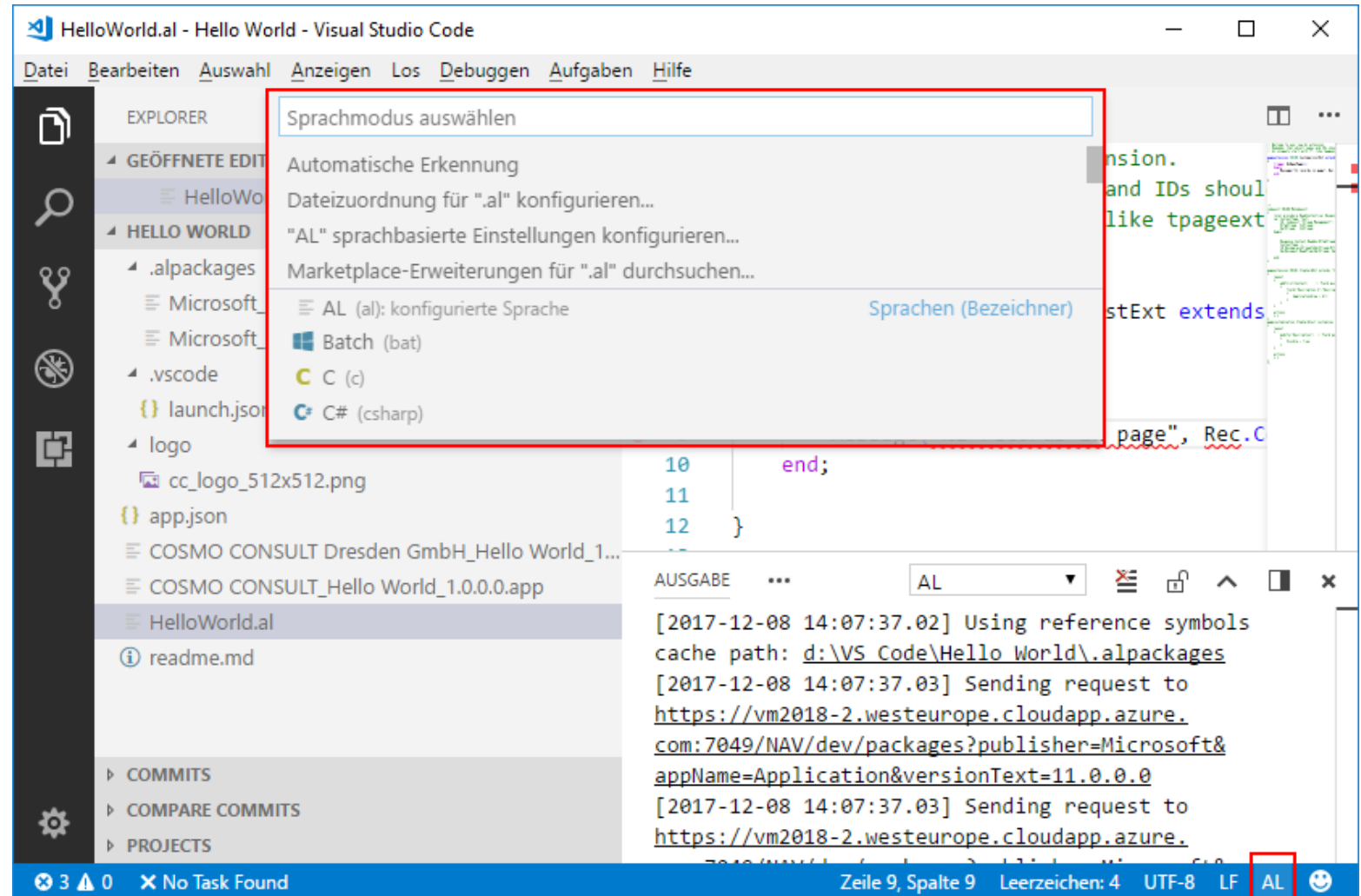
Gehe zu Definition	F12
Peek-Definition	Alt+F12
Alle Verweise suchen	Shift+F12
Symbol umbenennen	F2
Alle Vorkommen ändern	Ctrl+F2
Dokument formatieren	Alt+Shift+F

Debugging starten	F5
Ohne Debugging starten	Ctrl+F5
Debugging beenden	Shift+F5
Debugging erneut starten	Ctrl+Shift+F5
Konfigurationen öffnen	
Konfiguration hinzufügen...	
Prozedurschritt	F10
Einzelsschritt	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'

The right pane shows the 'Fields' of the current record, including:

- Fields: Count = 159
- No.: '01121212'
- Name: 'Spotsmeyer's Furnishings'
- Search Name: 'SPOTSMEYER'S FURNISHINGS'
- Name 2: ''
- Address: '612 South Sunset Drive'
- Address 2: ''
- City: 'Miami'
- Contact: 'Mr. Mike Nash'
- Phone No.: ''
- Telex No.: ''
- Document Sending Profile: ''
- Our Account No.: ''
- Territory Code: 'AUSLAND'
- Global Dimension 1 Code: 'VERKAUF'
- Global Dimension 2 Code: ''
- Chain Name: ''
- Budgeted Amount: 0

The bottom pane shows the 'Ausdruck' (Expression) pane with the expression 'Rec.Count = 100' highlighted in a red box. The expression is evaluated at line 14 of the code, where the 'Message' function is called.

# Snippets

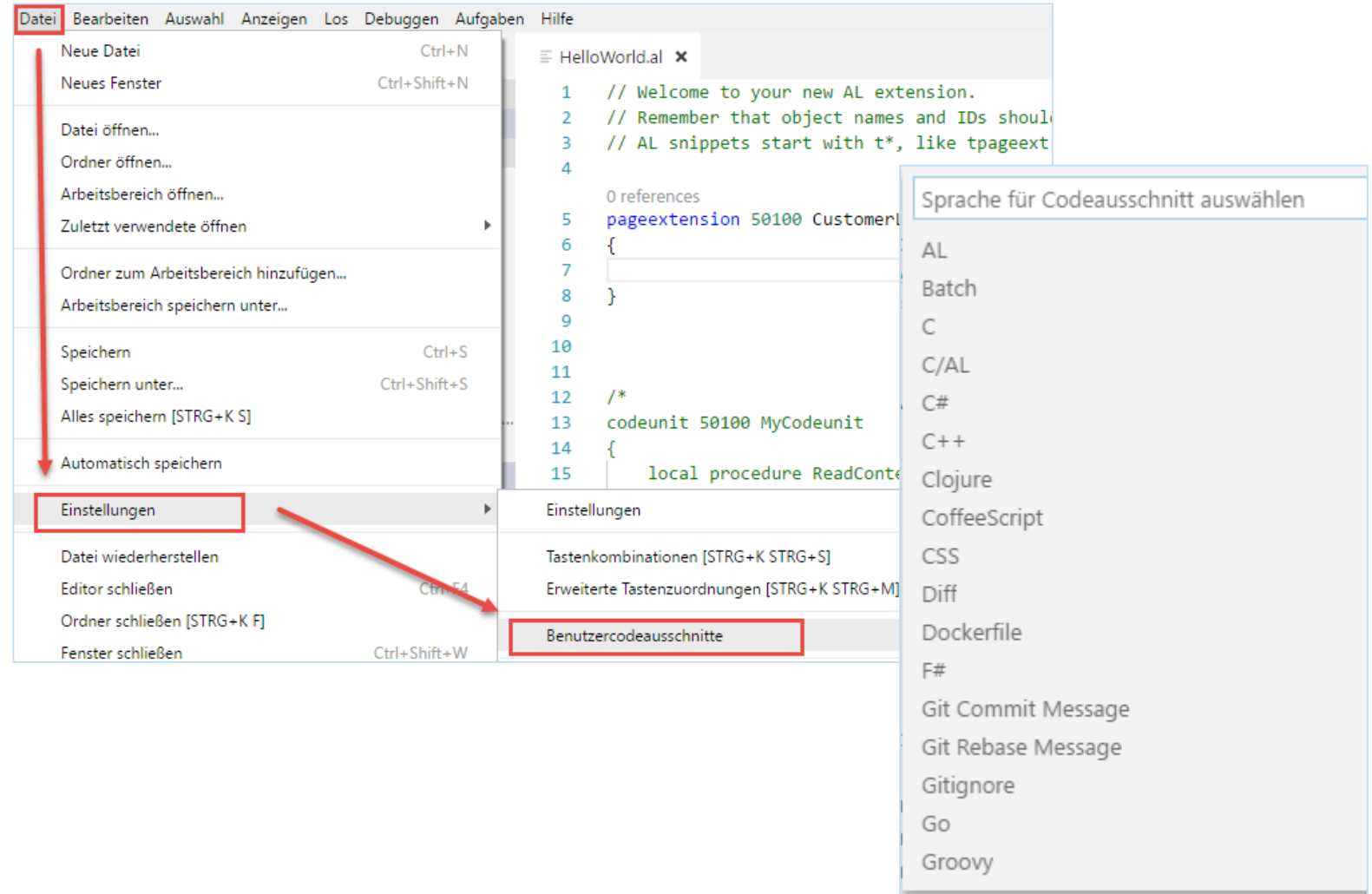
## ➤ Common Snippets (e.g. AL Language)

- `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;"],
  },
```

The screenshot shows a code editor with a snippet named 'mfuncrepeat' selected. The snippet is being applied to a code block. The code block contains the following code:

```
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;
```

The snippet's description is: "Function with a filtered repeat - until loop over a record variable. (Benutzercodeausschnitt)". The snippet's body is: "local procedure RepeatTableName(MyRecord: Record TableName);".

# 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>



Competence Team DevTech

[Microsoft AL](#)

