Modern Buildable Projects with IBM i Project Explorer and Bob

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Agenda

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- Challenges with Building on IBM i
- How does local development overcome this?
- What are IBM i Projects?
- What is Bob and how to use it?
- Ins and Outs of IBM i Project Explorer

Challenges with Building on IBM i

Building on IBM i is limiting…

1 SRC-PF
  - 10 char names
  - Fixed record length
  - Not accessible to open ecosystem, including Git and Make
  - Source of the same type stored in QxxxSRC to avoid name conflicts (member type does not disambiguate)

2 Libraries
  - Only 2 level hierarchy to organize, with only short 10 char names

3 Source control
  - None (sequence number dates)
  - Home grown
  - Proprietary IBM i systems
    - Cost
    - Smaller market = less investment

4 Build system
  - Individual CRTXXXMOD + CRTPGM
  - CL Scripts
  - A couple of vendors have dependency-based build

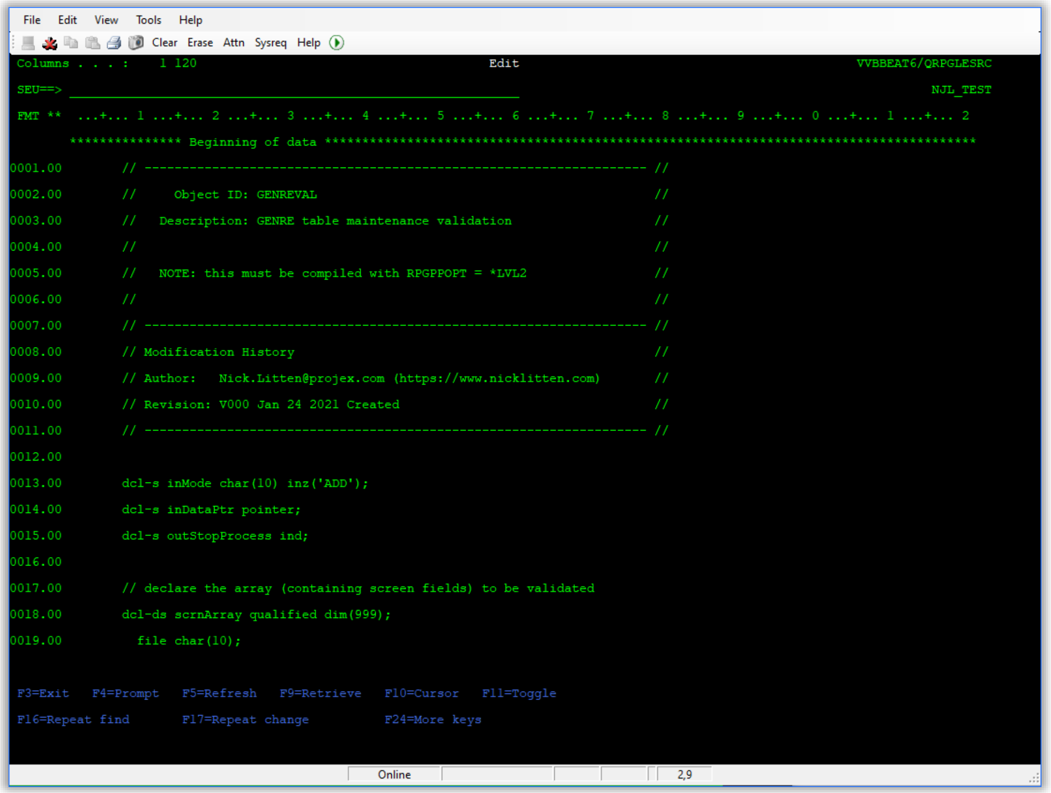
Let’s look ahead to the future

New Developers Incoming!

Need for Modernization is Urgent

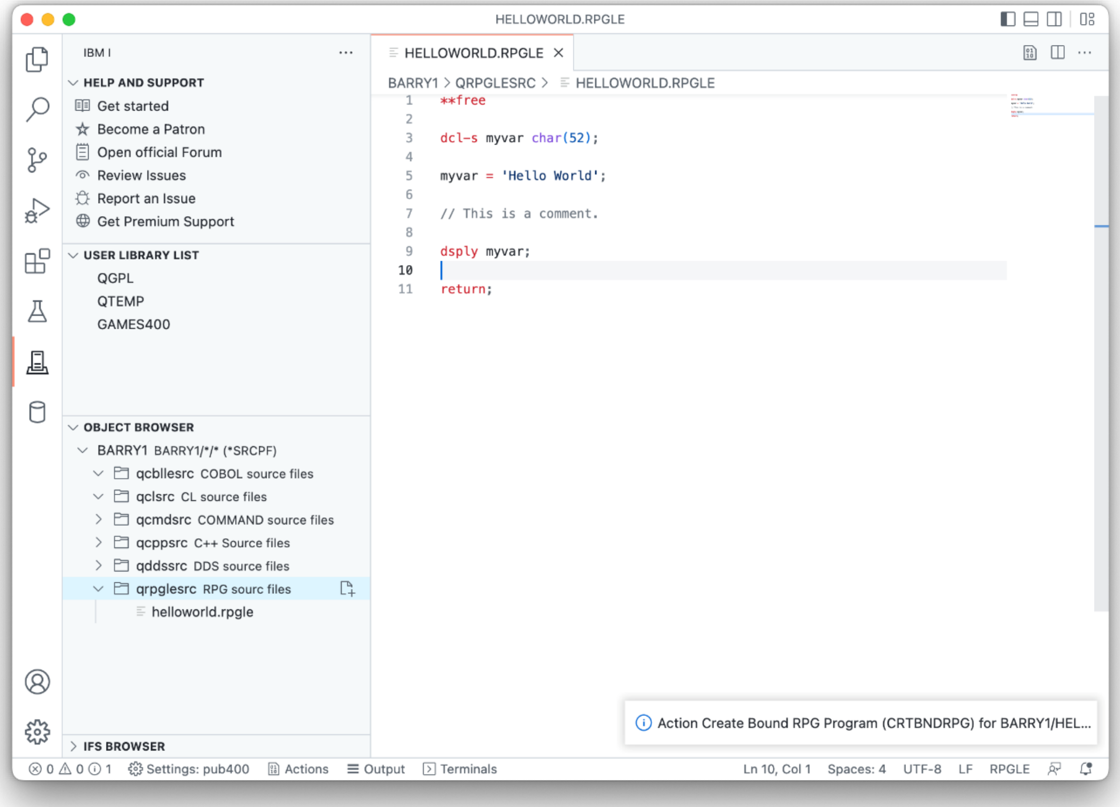
New development tools/ecosystems (ie. Code for IBM i/Merlin)

Modern development practices (ie. Git)


File
Edit
View
Tools
Help
Clear
Erase
Attn
Sysreq
Help
Online
2,9

```
 Columns . . . :    1 120                        Edit                         VVBBEAT6/QRPGLESRC
 SEU==> ____________________________________________________________                     NJL_TEST
 FMT ** ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8 ...+... 9 ...+... 0 ...+... 1 ...+... 2
        *************** Beginning of data *************************************************************************************
0001.00        // ------------------------------------------------------------------- //
0002.00        //     Object ID: GENREVAL                                             //
0003.00        //   Description: GENRE table maintenance validation                   //
0004.00        //                                                                     //
0005.00        //   NOTE: this must be compiled with RPGPPOPT = *LVL2                 //
0006.00        //                                                                     //
0007.00        // ------------------------------------------------------------------- //
0008.00        // Modification History                                                //
0009.00        // Author:   Nick.Litten@projex.com (https://www.nicklitten.com)       //
0010.00        // Revision: V000 Jan 24 2021 Created                                  //
0011.00        // ------------------------------------------------------------------- //
0012.00
0013.00        dcl-s inMode char(10) inz('ADD');
0014.00        dcl-s inDataPtr pointer;
0015.00        dcl-s outStopProcess ind;
0016.00
0017.00        // declare the array (containing screen fields) to be validated
0018.00        dcl-ds scrnArray qualified dim(999);
0019.00          file char(10);

 F3=Exit   F4=Prompt   F5=Refresh   F9=Retrieve   F10=Cursor   F11=Toggle
 F16=Repeat find       F17=Repeat change          F24=More keys
```


HELLOWORLD.RPGLE
IBM I
HELP AND SUPPORT
Get started
Become a Patron
Open official Forum
Review Issues
Report an Issue
Get Premium Support
USER LIBRARY LIST
QGPL
QTEMP
GAMES400
OBJECT BROWSER
BARRY1 BARRY1/*/* (*SRCPF)
qcbllesrc COBOL source files
qclsrc CL source files
qcmdsrc COMMAND source files
qcppsrc C++ Source files
qddsrc DDS source files
qrpglesrc RPG sourc files
helloworld.rpgle
IFS BROWSER
HELLOWORLD.RPGLE
BARRY1 > QRPGLESRC > HELLOWORLD.RPGLE
0 0 1
Settings: pub400
Actions
Output
Terminals
Ln 10, Col 1
Spaces: 4
UTF-8
LF
RPGLE

```
**free

dcl-s myvar char(52);

myvar = 'Hello World';

// This is a comment.

dsply myvar;

return;
```

Action Create Bound RPG Program (CRTBNDRPG) for BARRY1/HEL...

How does local development overcome this?

Let's use a different (but similar) file system

MYPROJECT
- QRPGLESRC
  - CUSTOMER.RPGLE
  - INVENTORY.RPGLE
  - STARTJOB.RPGLE
- QSQLSRC
  - CUSTOMERS.SQL
  - INVENTORY.SQL
- QCLLESRC
  - START.CLLE
- QCMDSRC
  - STARTJOB.CMD

QSYS.LIB Library

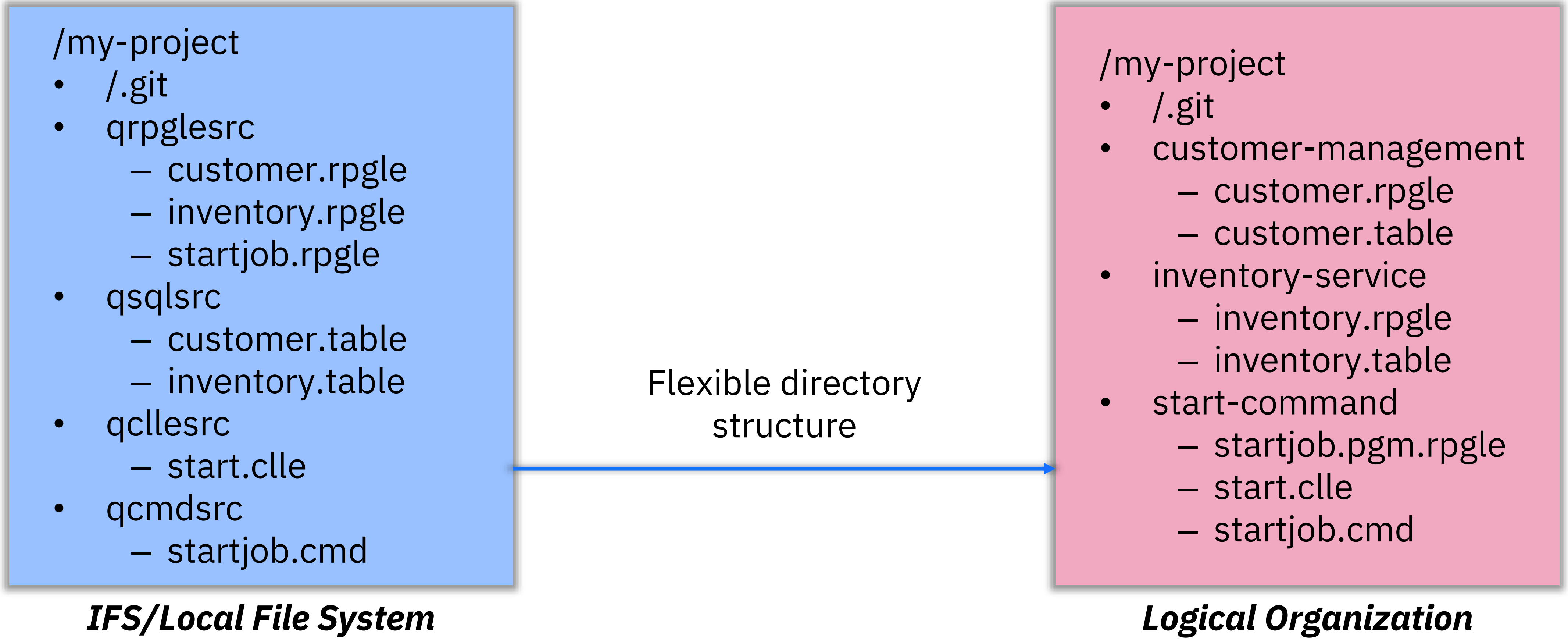
No more character name restrictions

Now usable with Git and Make

/my-project
- /.git
- qrpglesrc
  - customer.rpgle
  - inventory.rpgle
  - startjob.rpgle
- qsqlsrc
  - customer.table
  - inventory.table
- qcllesrc
  - start.clle
- qcmdsrc
  - startjob.cmd

IFS/Local File System

Let’s go one step further!



/my-project
- /.git
- qrpglesrc
  - customer.rpgle
  - inventory.rpgle
  - startjob.rpgle
- qsqlsrc
  - customer.table
  - inventory.table
- qcllesrc
  - start.clle
- qcmdsrc
  - startjob.cmd

IFS/Local File System

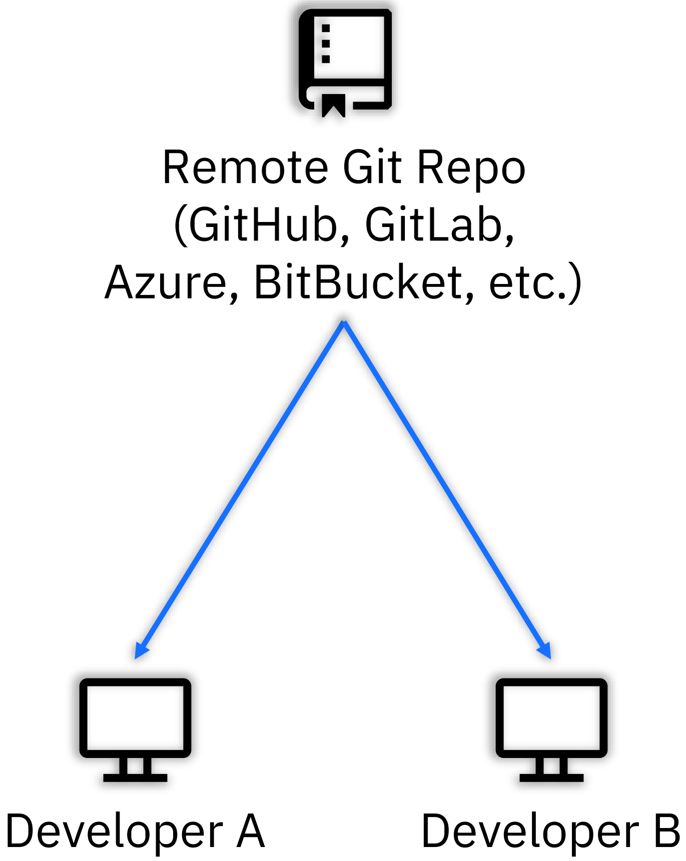
Flexible directory structure

/my-project
- /.git
- customer-management
  - customer.rpgle
  - customer.table
- inventory-service
  - inventory.rpgle
  - inventory.table
- start-command
  - startjob.pgm.rpgle
  - start.clle
  - startjob.cmd

Logical Organization

Unlocking source control with Git

Distributed Development

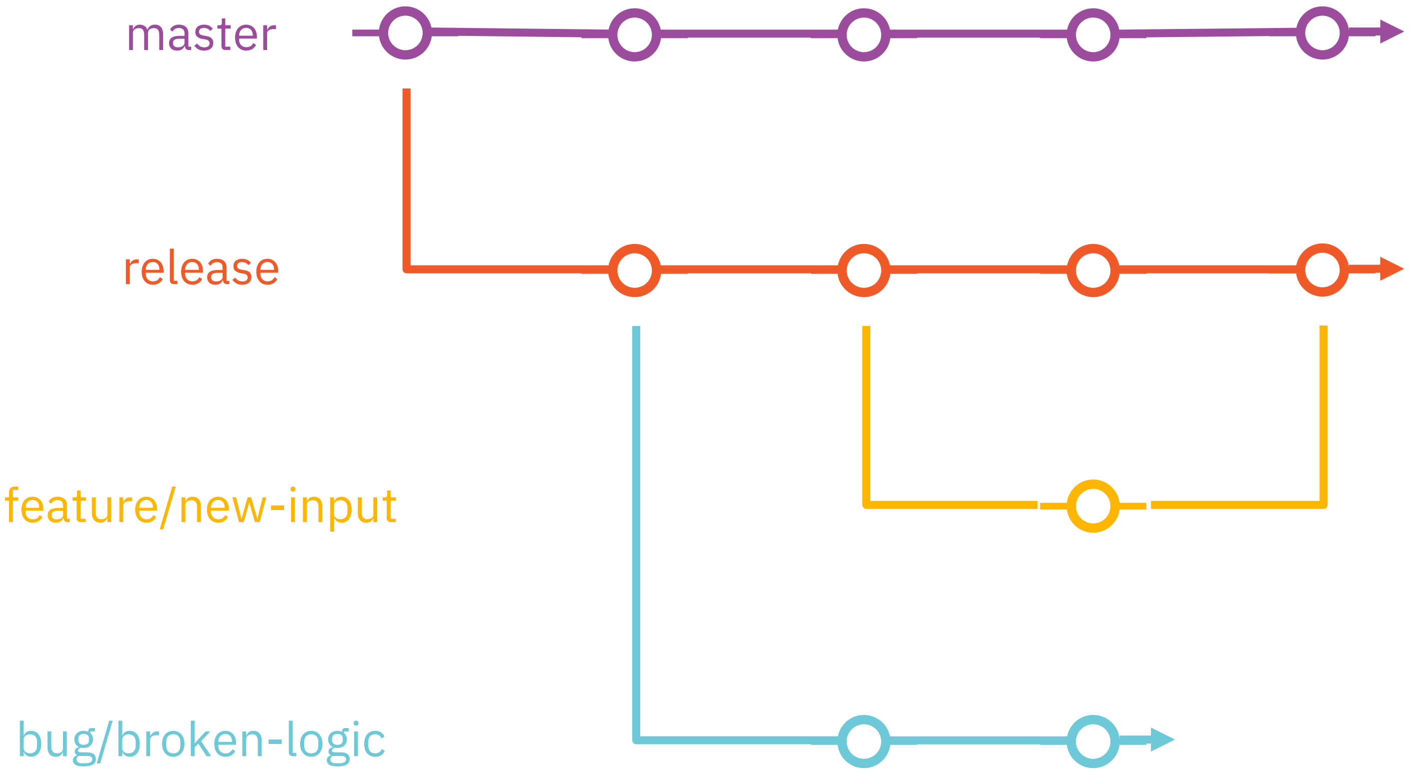


Remote Git Repo
(GitHub, GitLab,
Azure, BitBucket, etc.)

Developer A

Developer B

Version Control and Git Workflow



master

release

feature/new-input

bug/broken-logic

Did we solve our problems?

1 ~~SRC-PF~~
  - ~~10 char names~~
  - ~~Fixed record length~~
  - ~~Not accessible to open ecosystem, including Git and Make~~
  - ~~Source of the same type stored in QxxxSRC to avoid name conflicts (member type does not disambiguate)~~

✓

2 ~~Libraries~~
  - ~~Only 2 level hierarchy to organize, with only short 10 char names~~

✓

3 ~~Source control~~
  - ~~None (sequence number dates)~~
  - ~~Home grown~~
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    - ~~Cost~~
    - ~~Smaller market = less investment~~

✓

4 Build system
  - Individual CRTXXXMOD + CRTPGM
  - CL Scripts
  - A couple of vendors have dependency-based build

?

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What are IBM i Projects?

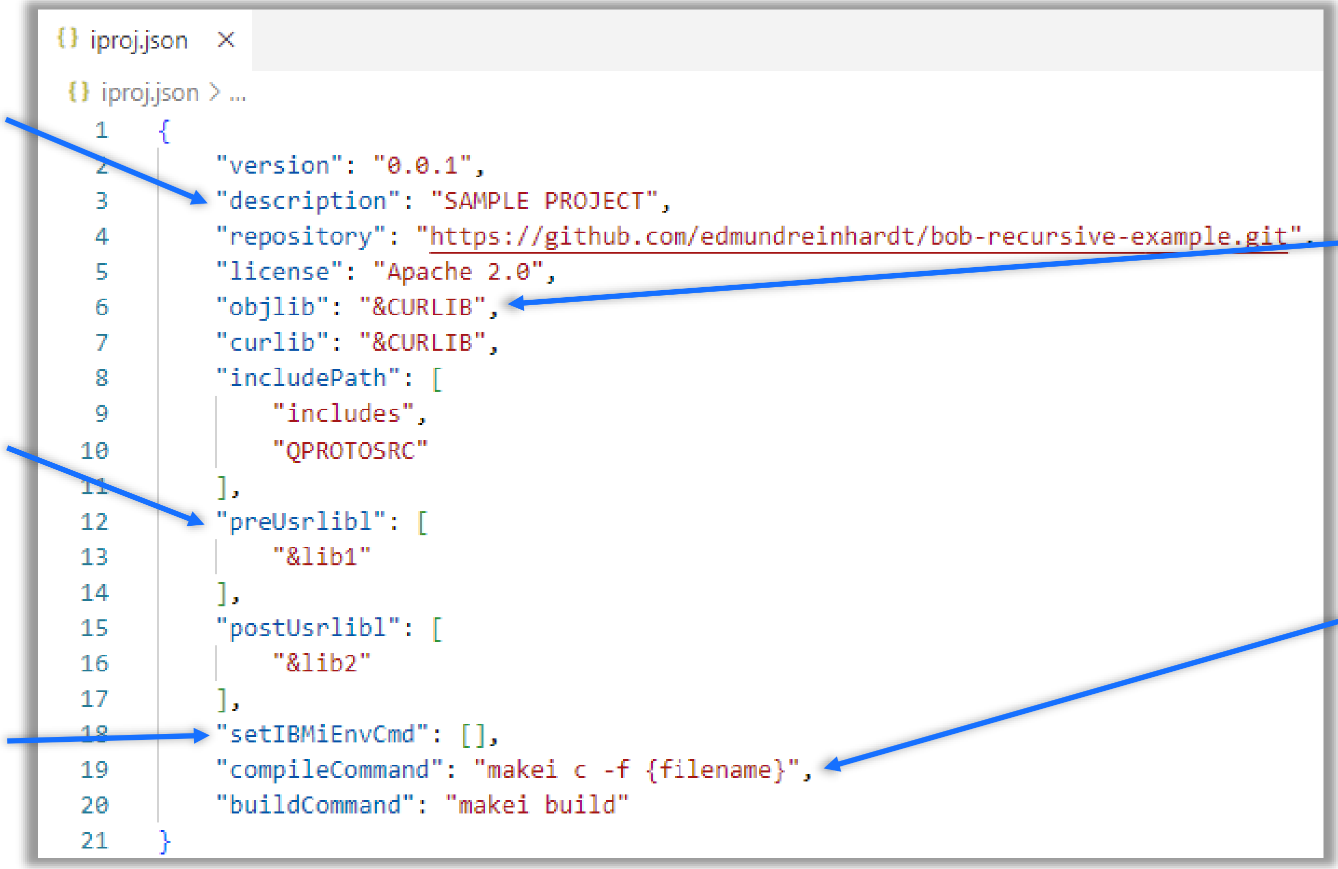
Projects that self-describe how to build themselves!?

- my-project
  - .evfevent
    - file.evfevent
    - source.evfevent
  - .logs
    - joblog.json
    - file.splf
    - source.splf
  - includes
    - constants.rpgleinc
  - QRPGLESRC
    - .ibmi.json
    - Rules.mk
    - source.rpgle
  - QDDSSRC
    - Rules.mk
    - file.pf
  - .env
  - .gitignore
  - .ibmi.json
  - iproj.json
  - Rules.mk

Project Information

Configure library list

Configure build/compile environment



```
{
    "version": "0.0.1",
    "description": "SAMPLE PROJECT",
    "repository": "https://github.com/edmundreinhardt/bob-recursive-example.git",
    "license": "Apache 2.0",
    "objlib": "&CURLIB",
    "curlib": "&CURLIB",
    "includePath": [
        "includes",
        "QPROTOSRC"
    ],
    "preUsrlibl": [
        "&lib1"
    ],
    "postUsrlibl": [
        "&lib2"
    ],
    "setIBMiEnvCmd": [],
    "compileCommand": "makei c -f {filename}",
    "buildCommand": "makei build"
}
```

Standardized metadata format with variables (&...)

Set build/compile command

iproj.json in project root

Flexible subdirectories and build customization

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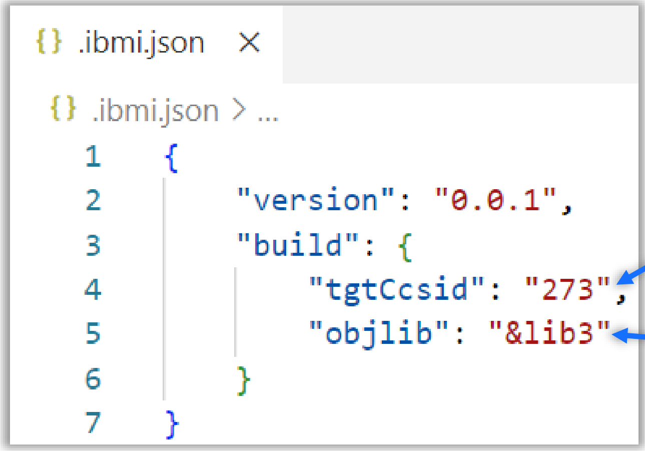
```
my-project
├─ .evfevent
│  ├─ file.evfevent
│  └─ source.evfevent
├─ .logs
│  ├─ joblog.json
│  ├─ file.splf
│  └─ source.splf
├─ includes
│  └─ constants.rpgleinc
├─ QRPGLESRC
│  ├─ .ibmi.json
│  ├─ Rules.mk
│  └─ source.rpgle
├─ QDDSSRC
│  ├─ Rules.mk
│  └─ file.pf
├─ .env
├─ .gitignore
├─ .ibmi.json
├─ iproj.json
└─ Rules.mk
```

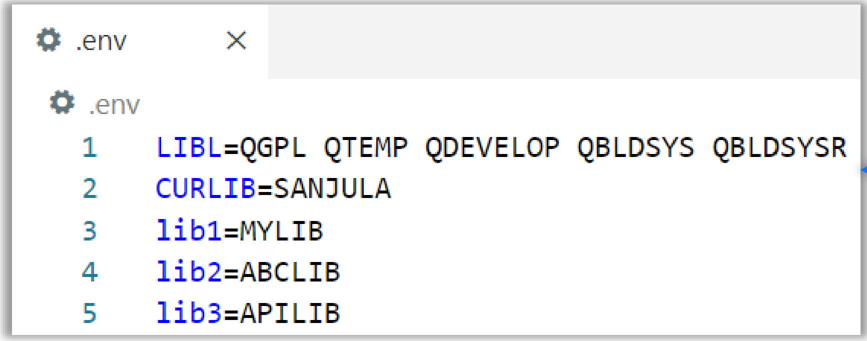


```json
{
    "version": "0.0.1",
    "build": {
        "tgtCcsid": "273",
        "objlib": "&lib3"
    }
}
```

EBCDIC encoding for compiler

Target object library for directory

.ibmi.json in project root or subdirectories



```
LIBL=QGPL QTEMP QDEVELOP QBLDSYS QBLDSYSR
CURLIB=SANJULA
lib1=MYLIB
lib2=ABCLIB
lib3=APILIB
```

Custom variable values so that each developer can customize build

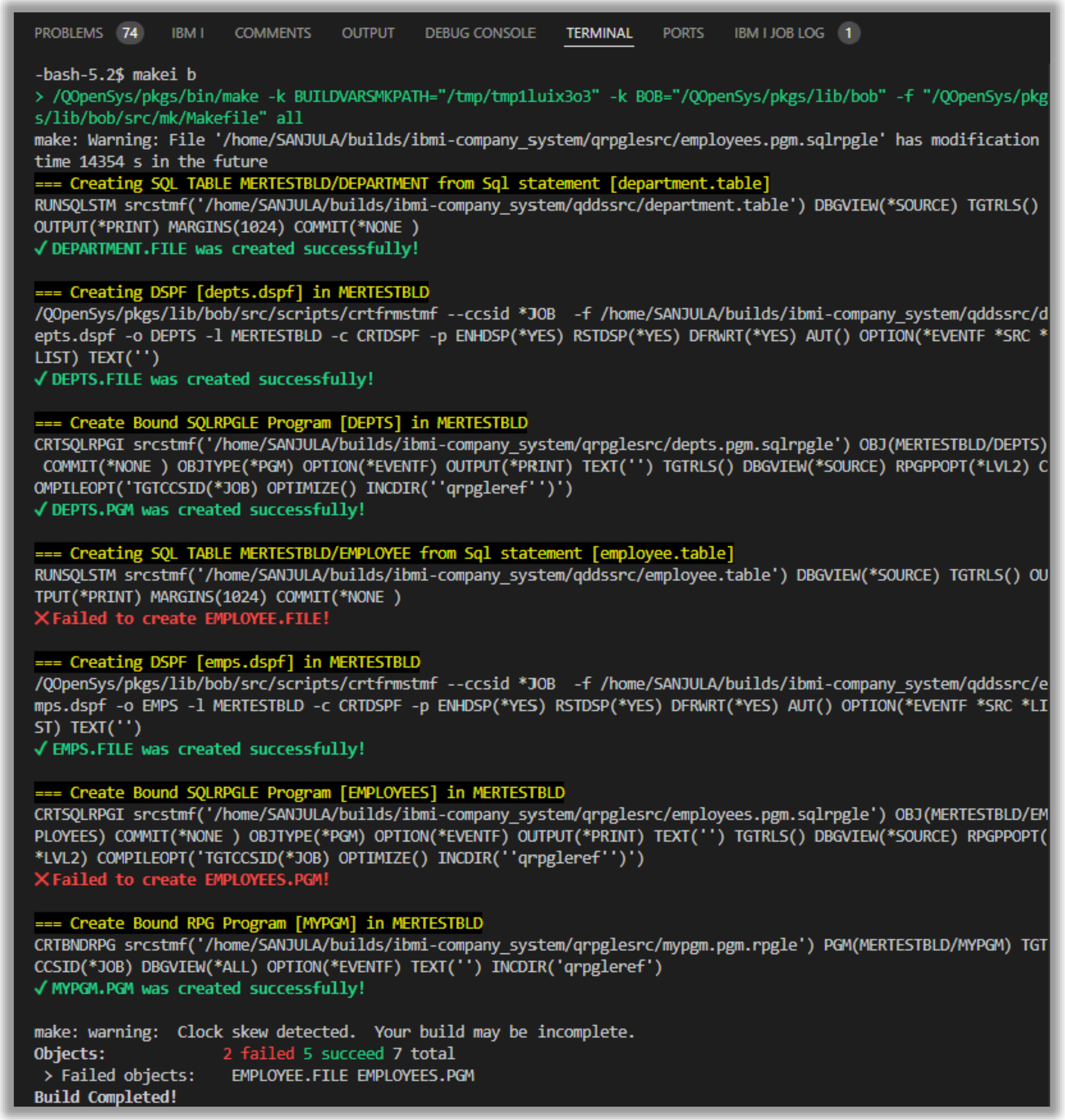
.env in project root

What is Bob and how to use it?

What is Bob?

Free and open-source build system to build QSYS objects on IBM i

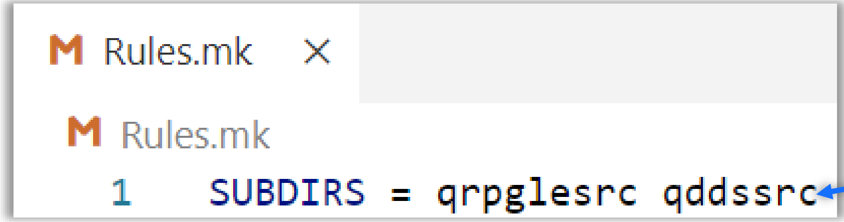
- 🚀 Speed: Compile objects that need recompiling (new or changed source code)
- 🛠 Reliability: If an item changes, then it and everything it depending on it will be rebuilt
- 💎 Industry standard: Object dependencies are specified using standard makefile syntax
- 🔧 Flexibility: Override compile parameters, write custom recipes (If you can code it, you can build it!)
- 🌟 Ease of use: Build with a single command or a single button in an IDE (IBM i Project Explorer in VS Code)



```
-bash-5.2$ makei b
> /QOpenSys/pkgs/bin/make -k BUILDVARSMKPATH="/tmp/tmp1luix3o3" -k BOB="/QOpenSys/pkgs/lib/bob" -f "/QOpenSys/pkg
s/lib/bob/src/mk/Makefile" all
make: Warning: File '/home/SANJULA/builds/ibmi-company_system/qrpglesrc/employees.pgm.sqlrpgle' has modification
time 14354 s in the future
=== Creating SQL TABLE MERTESTBLD/DEPARTMENT from Sql statement [department.table]
RUNSQLSTM srcstmf('/home/SANJULA/builds/ibmi-company_system/qddssrc/department.table') DBGVIEW(*SOURCE) TGTRLS()
OUTPUT(*PRINT) MARGINS(1024) COMMIT(*NONE )
✓ DEPARTMENT.FILE was created successfully!

=== Creating DSPF [depts.dspf] in MERTESTBLD
/QOpenSys/pkgs/lib/bob/src/scripts/crtfrmstmf --ccsid *JOB  -f /home/SANJULA/builds/ibmi-company_system/qddssrc/d
epts.dspf -o DEPTS -l MERTESTBLD -c CRTDSPF -p ENHDSP(*YES) RSTDSP(*YES) DFRWRT(*YES) AUT() OPTION(*EVENTF *SRC *
LIST) TEXT('')
✓ DEPTS.FILE was created successfully!

=== Create Bound SQLRPGLE Program [DEPTS] in MERTESTBLD
CRTSQLRPGI srcstmf('/home/SANJULA/builds/ibmi-company_system/qrpglesrc/depts.pgm.sqlrpgle') OBJ(MERTESTBLD/DEPTS)
 COMMIT(*NONE ) OBJTYPE(*PGM) OPTION(*EVENTF) OUTPUT(*PRINT) TEXT('') TGTRLS() DBGVIEW(*SOURCE) RPGPPOPT(*LVL2) C
OMPILEOPT('TGTCCSID(*JOB) OPTIMIZE() INCDIR(''qrpgleref'')')
✓ DEPTS.PGM was created successfully!

=== Creating SQL TABLE MERTESTBLD/EMPLOYEE from Sql statement [employee.table]
RUNSQLSTM srcstmf('/home/SANJULA/builds/ibmi-company_system/qddssrc/employee.table') DBGVIEW(*SOURCE) TGTRLS() OU
TPUT(*PRINT) MARGINS(1024) COMMIT(*NONE )
✗ Failed to create EMPLOYEE.FILE!

=== Creating DSPF [emps.dspf] in MERTESTBLD
/QOpenSys/pkgs/lib/bob/src/scripts/crtfrmstmf --ccsid *JOB  -f /home/SANJULA/builds/ibmi-company_system/qddssrc/e
mps.dspf -o EMPS -l MERTESTBLD -c CRTDSPF -p ENHDSP(*YES) RSTDSP(*YES) DFRWRT(*YES) AUT() OPTION(*EVENTF *SRC *LI
ST) TEXT('')
✓ EMPS.FILE was created successfully!

=== Create Bound SQLRPGLE Program [EMPLOYEES] in MERTESTBLD
CRTSQLRPGI srcstmf('/home/SANJULA/builds/ibmi-company_system/qrpglesrc/employees.pgm.sqlrpgle') OBJ(MERTESTBLD/EM
PLOYEES) COMMIT(*NONE ) OBJTYPE(*PGM) OPTION(*EVENTF) OUTPUT(*PRINT) TEXT('') TGTRLS() DBGVIEW(*SOURCE) RPGPPOPT(
*LVL2) COMPILEOPT('TGTCCSID(*JOB) OPTIMIZE() INCDIR(''qrpgleref'')')
✗ Failed to create EMPLOYEES.PGM!

=== Create Bound RPG Program [MYPGM] in MERTESTBLD
CRTBNDRPG srcstmf('/home/SANJULA/builds/ibmi-company_system/qrpglesrc/mypgm.pgm.rpgle') PGM(MERTESTBLD/MYPGM) TGT
CCSID(*JOB) DBGVIEW(*ALL) OPTION(*EVENTF) TEXT('') INCDIR('qrpgleref')
✓ MYPGM.PGM was created successfully!

make: warning:  Clock skew detected.  Your build may be incomplete.
Objects:             2 failed 5 succeed 7 total
 > Failed objects:    EMPLOYEE.FILE EMPLOYEES.PGM
Build Completed!
```

Defining targets with Rules.mk

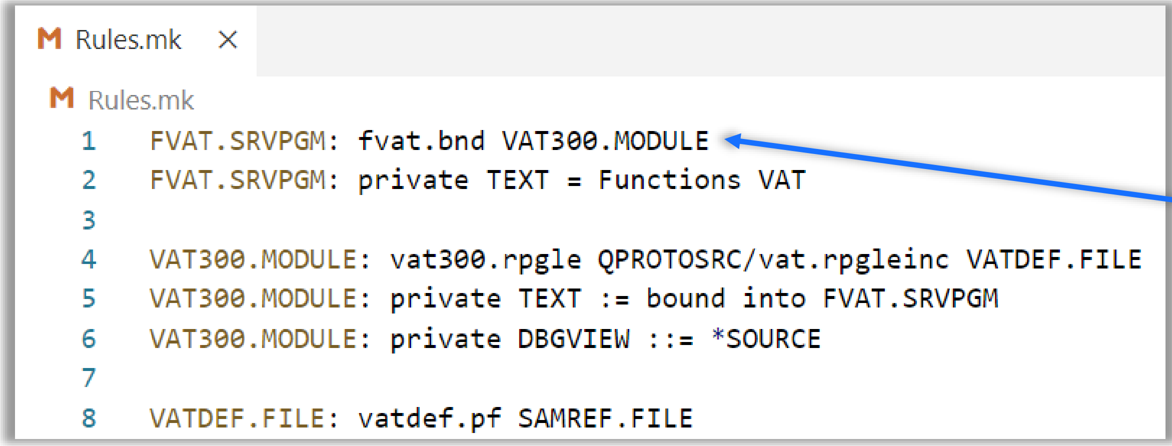
- my-project
  - .evfevent
    - file.evfevent
    - source.evfevent
  - .logs
    - joblog.json
    - file.splf
    - source.splf
  - includes
    - constants.rpgleinc
  - QRPGLESRC
    - .ibmi.json
    - Rules.mk
    - source.rpgle
  - QDDSSRC
    - Rules.mk
    - file.pf
  - .env
  - .gitignore
  - .ibmi.json
  - iproj.json
  - Rules.mk



```
SUBDIRS = qrpglesrc qddssrc
```

Rules.mk in project root

Declare subdirectories to be built



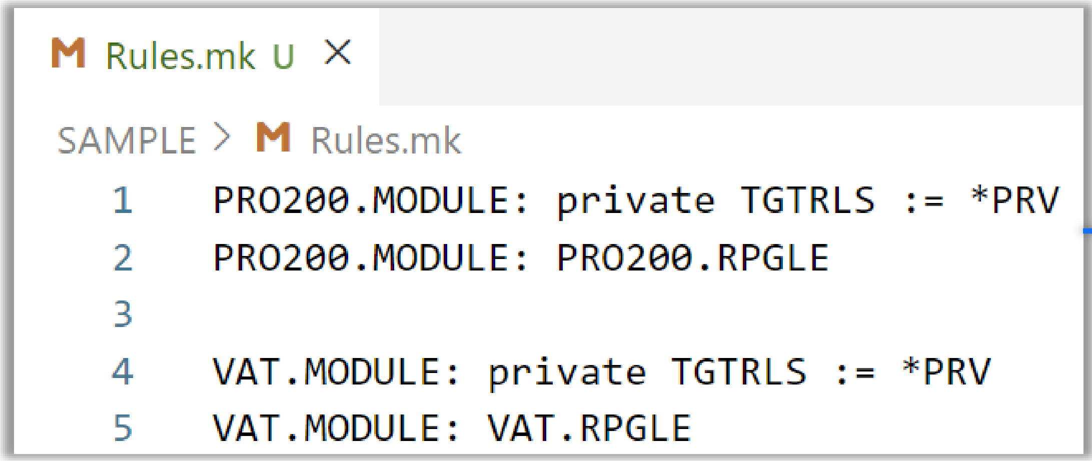
```
FVAT.SRVPGM: fvat.bnd VAT300.MODULE
FVAT.SRVPGM: private TEXT = Functions VAT

VAT300.MODULE: vat300.rpgle QPROTOSRC/vat.rpgleinc VATDEF.FILE
VAT300.MODULE: private TEXT := bound into FVAT.SRVPGM
VAT300.MODULE: private DBGVIEW ::= *SOURCE

VATDEF.FILE: vatdef.pf SAMREF.FILE
```

Rules.mk in subdirectories

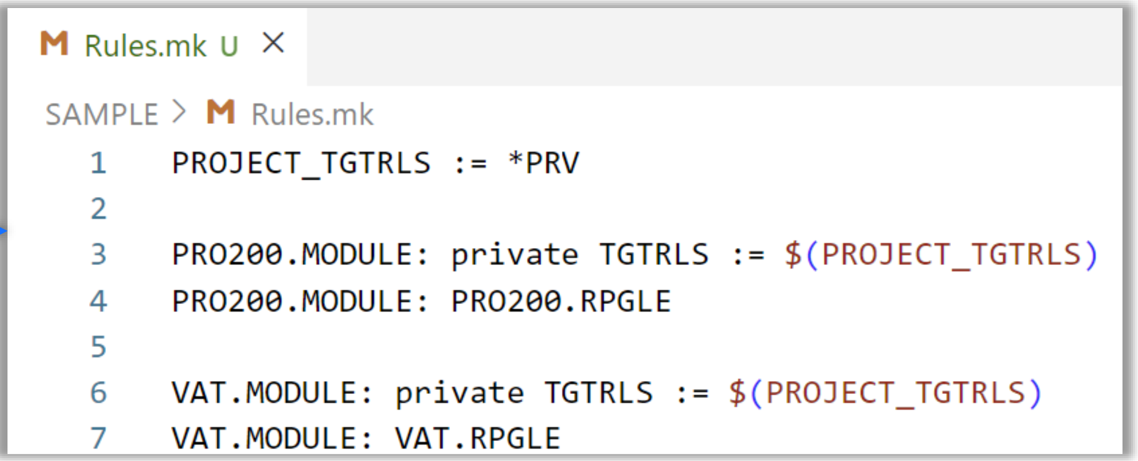
Makefile with list of objects to be built and from which source files

Variables in Rules.mk

Declare variables to override compile settings for multiple targets


Rules.mk U
SAMPLE > Rules.mk

```
PRO200.MODULE: private TGTRLS := *PRV
PRO200.MODULE: PRO200.RPGLE

VAT.MODULE: private TGTRLS := *PRV
VAT.MODULE: VAT.RPGLE
```


Rules.mk U
SAMPLE > Rules.mk

```
PROJECT_TGTRLS := *PRV

PRO200.MODULE: private TGTRLS := $(PROJECT_TGTRLS)
PRO200.MODULE: PRO200.RPGLE

VAT.MODULE: private TGTRLS := $(PROJECT_TGTRLS)
VAT.MODULE: VAT.RPGLE
```

Wildcarding in Rules.mk

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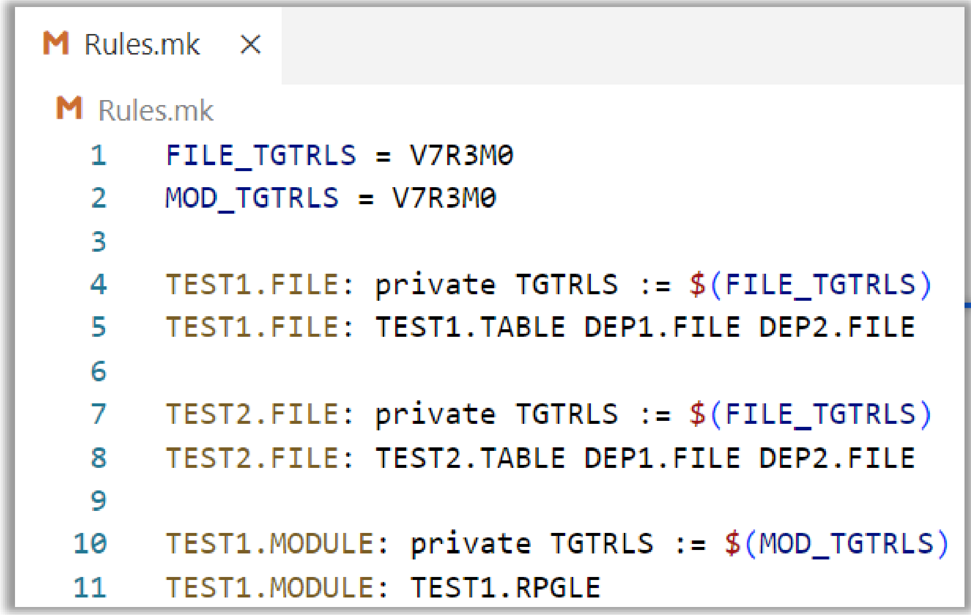
Use wildcarding when you have files that create objects of the same type

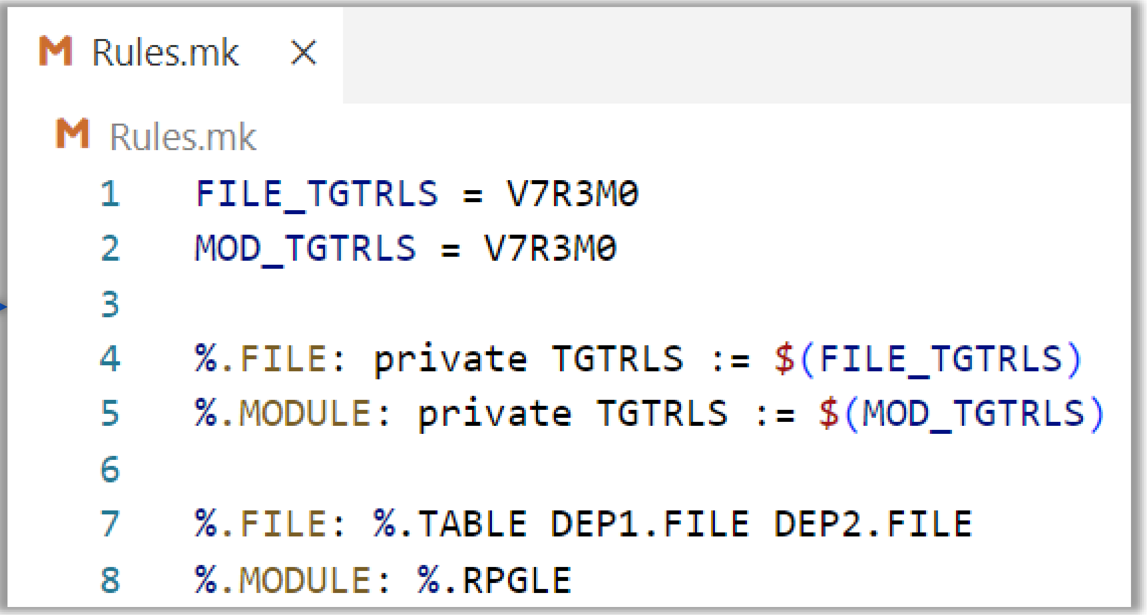


```
FILE_TGTRLS = V7R3M0
MOD_TGTRLS = V7R3M0

TEST1.FILE: private TGTRLS := $(FILE_TGTRLS)
TEST1.FILE: TEST1.TABLE DEP1.FILE DEP2.FILE

TEST2.FILE: private TGTRLS := $(FILE_TGTRLS)
TEST2.FILE: TEST2.TABLE DEP1.FILE DEP2.FILE

TEST1.MODULE: private TGTRLS := $(MOD_TGTRLS)
TEST1.MODULE: TEST1.RPGLE
```



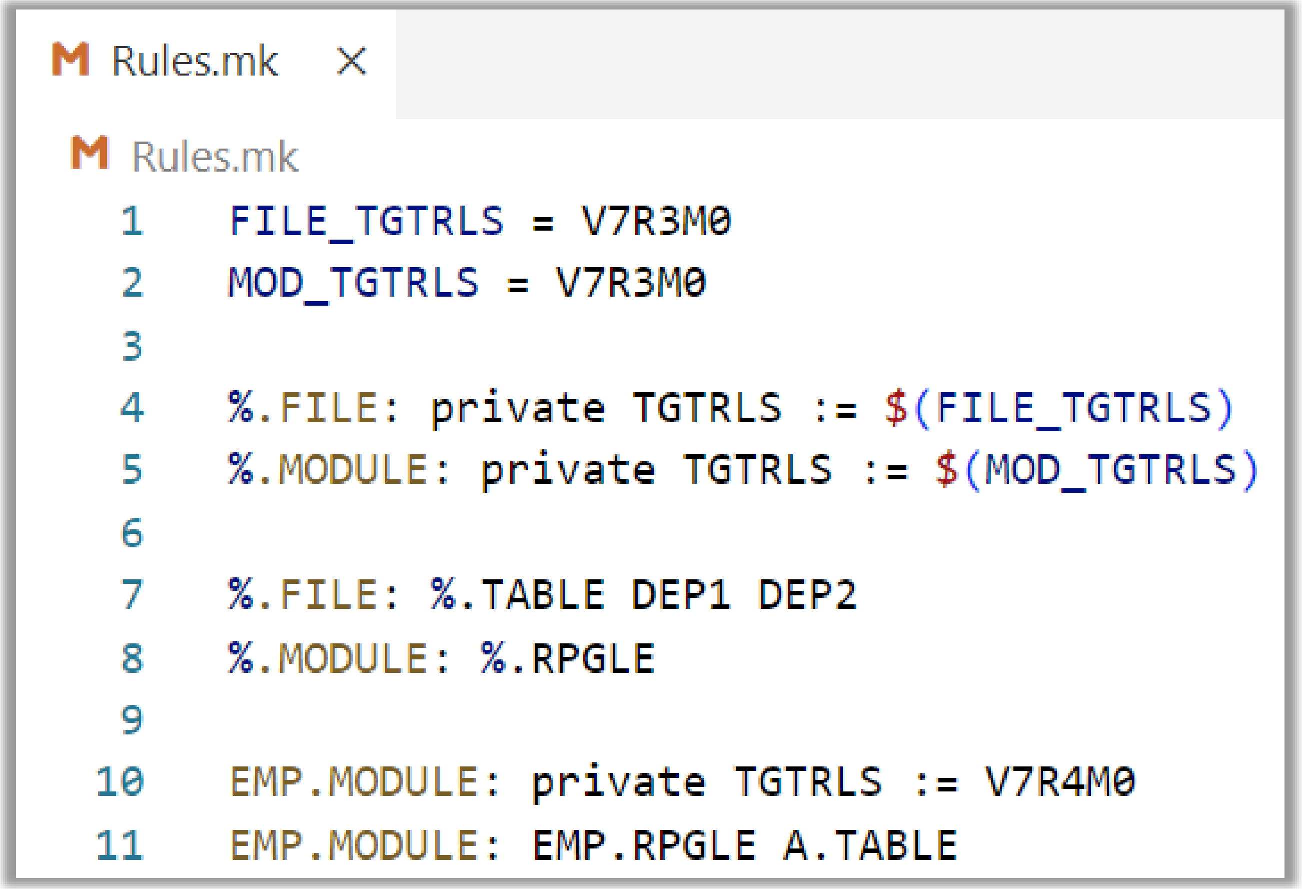
```
FILE_TGTRLS = V7R3M0
MOD_TGTRLS = V7R3M0

%.FILE: private TGTRLS := $(FILE_TGTRLS)
%.MODULE: private TGTRLS := $(MOD_TGTRLS)

%.FILE: %.TABLE DEP1.FILE DEP2.FILE
%.MODULE: %.RPGLE
```

Overriding Wildcards in Rules.mk

Explicitly defined compile options take precedence over wildcarding



```
FILE_TGTRLS = V7R3M0
MOD_TGTRLS = V7R3M0

%.FILE: private TGTRLS := $(FILE_TGTRLS)
%.MODULE: private TGTRLS := $(MOD_TGTRLS)

%.FILE: %.TABLE DEP1 DEP2
%.MODULE: %.RPGLE

EMP.MODULE: private TGTRLS := V7R4M0
EMP.MODULE: EMP.RPGLE A.TABLE
```

Supported Object Types

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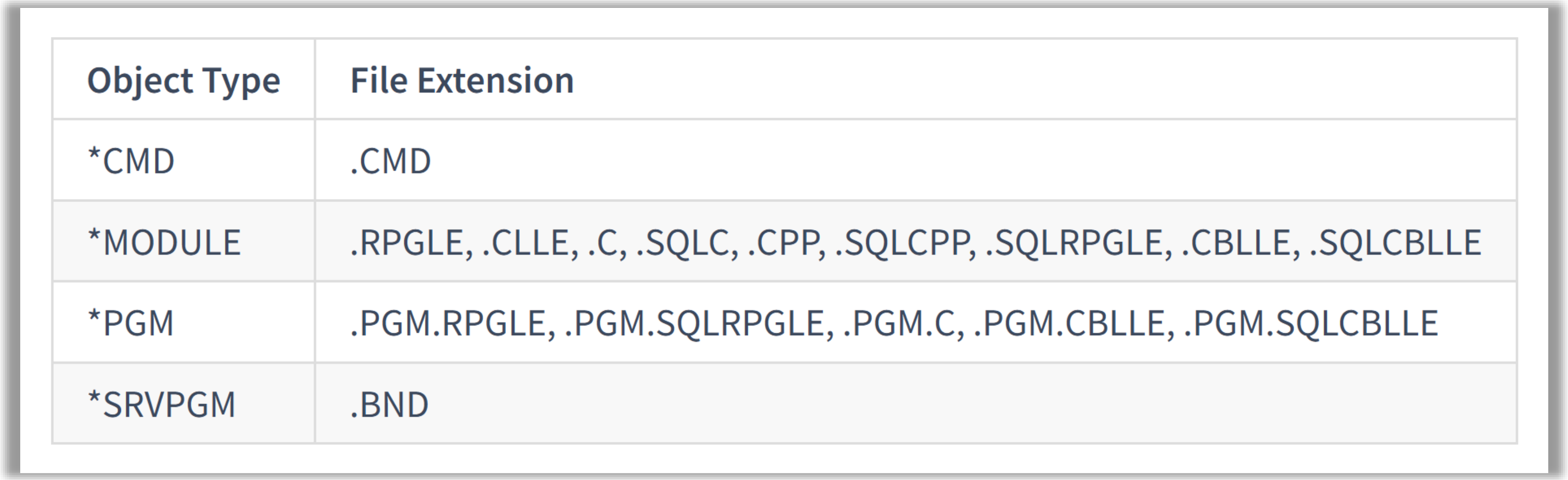
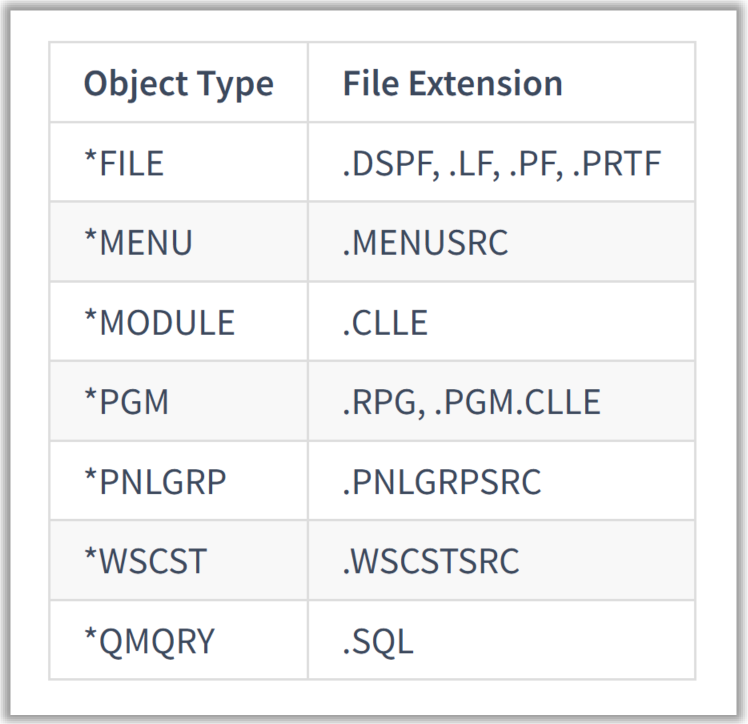
These IBM i source types can be compiled directly from the IFS ...



Object Type	File Extension
*CMD	.CMD
*MODULE	.RPGLE, .CLLE, .C, .SQLC, .CPP, .SQLCPP, .SQLRPGLE, .CBLLE, .SQLCBLLE
*PGM	.PGM.RPGLE, .PGM.SQLRPGLE, .PGM.C, .PGM.CBLLE, .PGM.SQLCBLLE
*SRVPGM	.BND

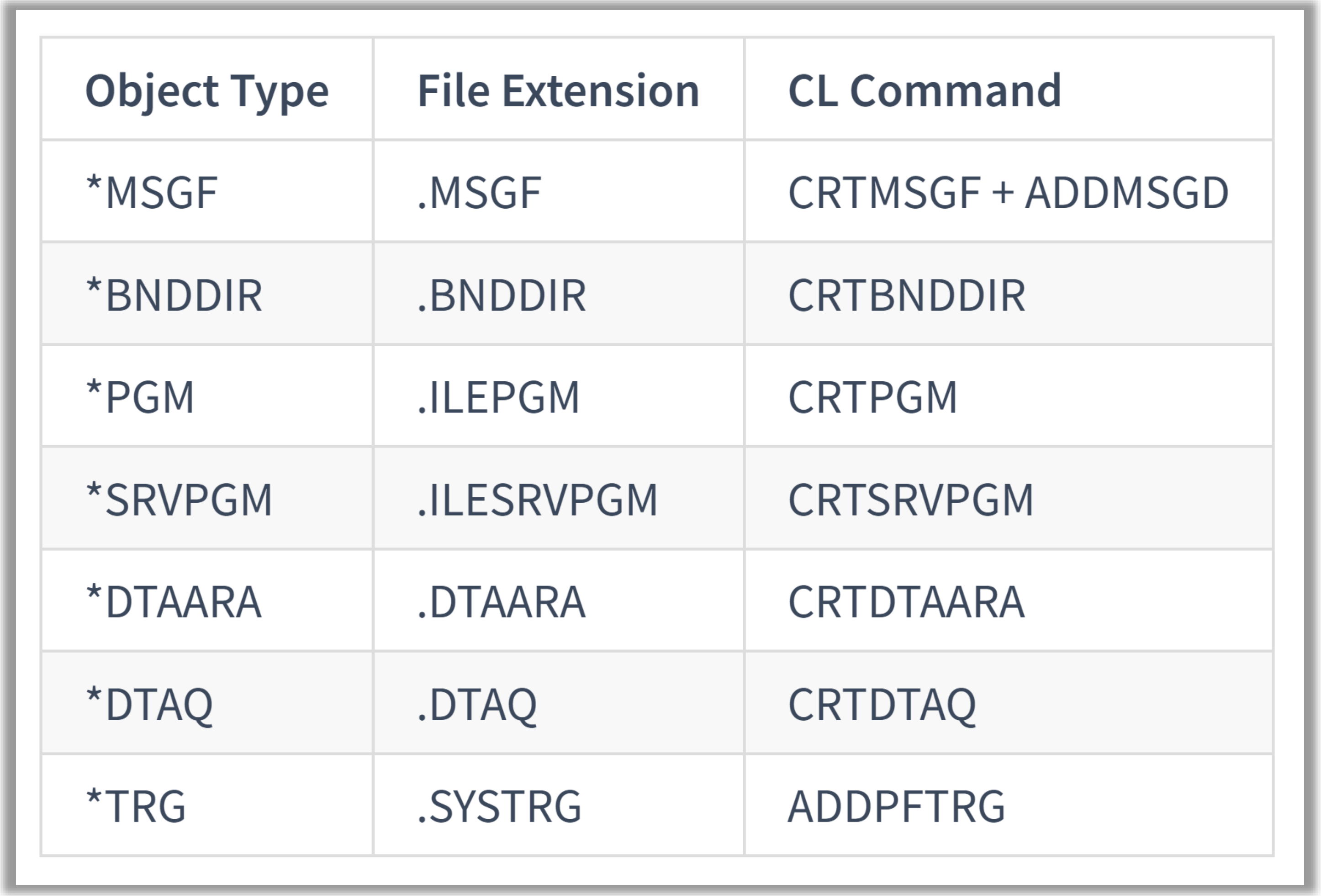
These older IBM i source types can be compiled as well (CRTFRMSTMF copies the source to QTEMP/QSOURCE before compiling)



Object Type	File Extension
*FILE	.DSPF, .LF, .PF, .PRTF
*MENU	.MENUSRC
*MODULE	.CLLE
*PGM	.RPG, .PGM.CLLE
*PNLGRP	.PNLGRPSRC
*WSCST	.WSCSTSRC
*QMQRY	.SQL

CL pseudo-source

The CL command to create these object types are stored in a file with the given extension …



Object Type	File Extension	CL Command
*MSGF	.MSGF	CRTMSGF + ADDMSGD
*BNDDIR	.BNDDIR	CRTBNDDIR
*PGM	.ILEPGM	CRTPGM
*SRVPGM	.ILESRVPGM	CRTSRVPGM
*DTAARA	.DTAARA	CRTDTAARA
*DTAQ	.DTAQ	CRTDTAQ
*TRG	.SYSTRG	ADDPFTRG

SQL pseudo-source

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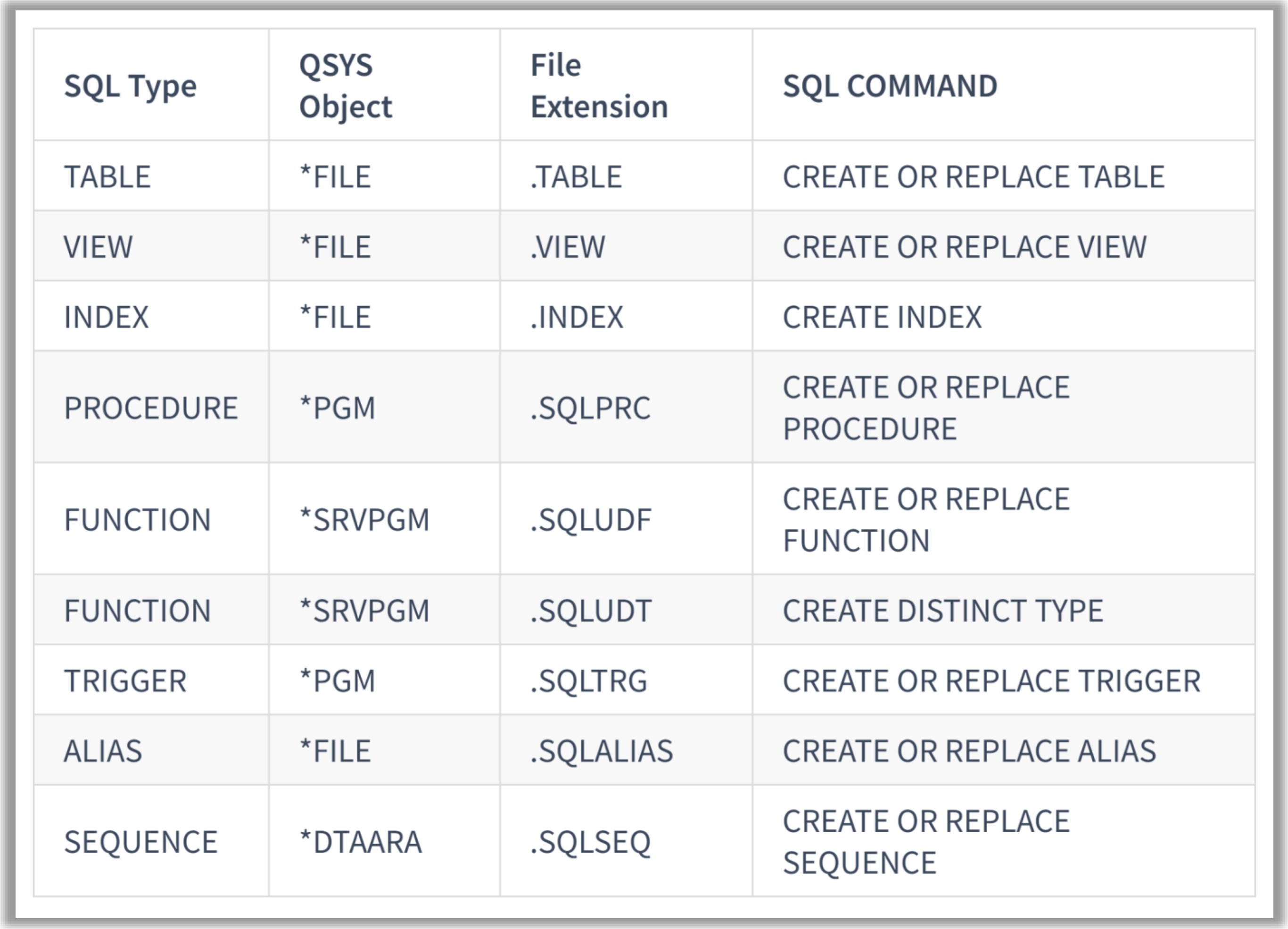
The SQL command to create these object types are stored in a file with the given extension and are created via RUNSQLSTM …



SQL Type	QSYS Object	File Extension	SQL COMMAND
TABLE	*FILE	.TABLE	CREATE OR REPLACE TABLE
VIEW	*FILE	.VIEW	CREATE OR REPLACE VIEW
INDEX	*FILE	.INDEX	CREATE INDEX
PROCEDURE	*PGM	.SQLPRC	CREATE OR REPLACE PROCEDURE
FUNCTION	*SRVPGM	.SQLUDF	CREATE OR REPLACE FUNCTION
FUNCTION	*SRVPGM	.SQLUDT	CREATE DISTINCT TYPE
TRIGGER	*PGM	.SQLTRG	CREATE OR REPLACE TRIGGER
ALIAS	*FILE	.SQLALIAS	CREATE OR REPLACE ALIAS
SEQUENCE	*DTAARA	.SQLSEQ	CREATE OR REPLACE SEQUENCE

Build and Compile Process

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Initialization and Migration

Command	Description
makei init	Create iproj.json
makei cvtsrcpf	Convert QSYS members to Unicode IFS stream files

Building

Command	Description
makei build	Build the entire project
makei b –t <object>	Build target object
makei b –d <directory>	Build all objects in the specified directory (based on Rules.mk)

Compiling

Command	Description
makei compile -f <stream file>	Compile target object of specified stream file
makei compile –files file1: file2: …	Compile target objects of all specified stream files

Ins and Outs of IBM i Project Explorer

Overview

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The ultimate tool for local development on IBM i!

Set variables

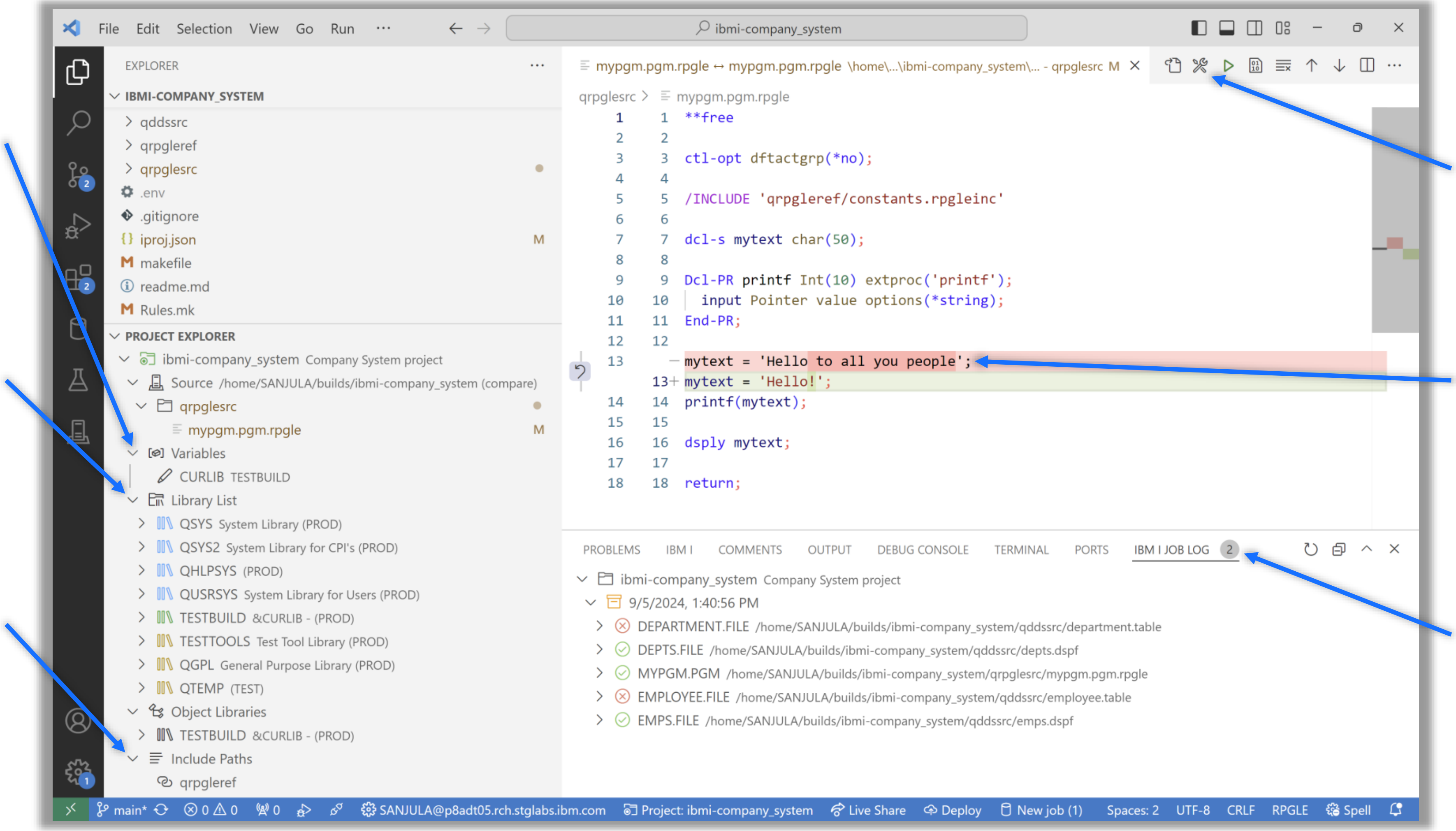
Manage library list

Modify include paths

Build and Compile

Local source vs. IFS source

View job logs


File
Edit
Selection
View
Go
Run
ibmi-company_system
EXPLORER
mypgm.pgm.rpgle ↔ mypgm.pgm.rpgle \home\...\ibmi-company_system\... - qrpglesrc M
qrpglesrc > mypgm.pgm.rpgle
PROBLEMS
IBM I
COMMENTS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
IBM I JOB LOG 2
main*
0 0
0
SANJULA@p8adt05.rch.stglabs.ibm.com
Project: ibmi-company_system
Live Share
Deploy
New job (1)
Spaces: 2
UTF-8
CRLF
RPGLE
Spell

IBMI-COMPANY_SYSTEM
- qddssrc
- qrpgleref
- qrpglesrc
- .env
- .gitignore
- iproj.json M
- makefile
- readme.md
- Rules.mk

PROJECT EXPLORER
- ibmi-company_system Company System project
  - Source /home/SANJULA/builds/ibmi-company_system (compare)
    - qrpglesrc
      - mypgm.pgm.rpgle M
  - Variables
    - CURLIB TESTBUILD
  - Library List
    - QSYS System Library (PROD)
    - QSYS2 System Library for CPI's (PROD)
    - QHLPSYS (PROD)
    - QUSRSYS System Library for Users (PROD)
    - TESTBUILD &CURLIB - (PROD)
    - TESTTOOLS Test Tool Library (PROD)
    - QGPL General Purpose Library (PROD)
    - QTEMP (TEST)
  - Object Libraries
    - TESTBUILD &CURLIB - (PROD)
  - Include Paths
    - qrpgleref

```
**free

ctl-opt dftactgrp(*no);

/INCLUDE 'qrpgleref/constants.rpgleinc'

dcl-s mytext char(50);

Dcl-PR printf Int(10) extproc('printf');
  input Pointer value options(*string);
End-PR;

mytext = 'Hello to all you people';
mytext = 'Hello!';
printf(mytext);

dsply mytext;

return;
```

- ibmi-company_system Company System project
  - 9/5/2024, 1:40:56 PM
    - DEPARTMENT.FILE /home/SANJULA/builds/ibmi-company_system/qddssrc/department.table
    - DEPTS.FILE /home/SANJULA/builds/ibmi-company_system/qddssrc/depts.dspf
    - MYPGM.PGM /home/SANJULA/builds/ibmi-company_system/qrpglesrc/mypgm.pgm.rpgle
    - EMPLOYEE.FILE /home/SANJULA/builds/ibmi-company_system/qddssrc/employee.table
    - EMPS.FILE /home/SANJULA/builds/ibmi-company_system/qddssrc/emps.dspf

Installation

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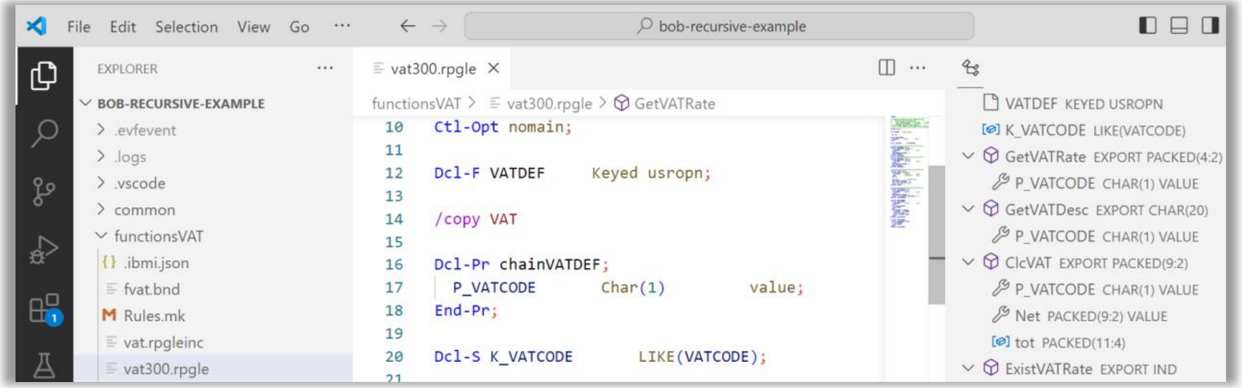
continuous integration

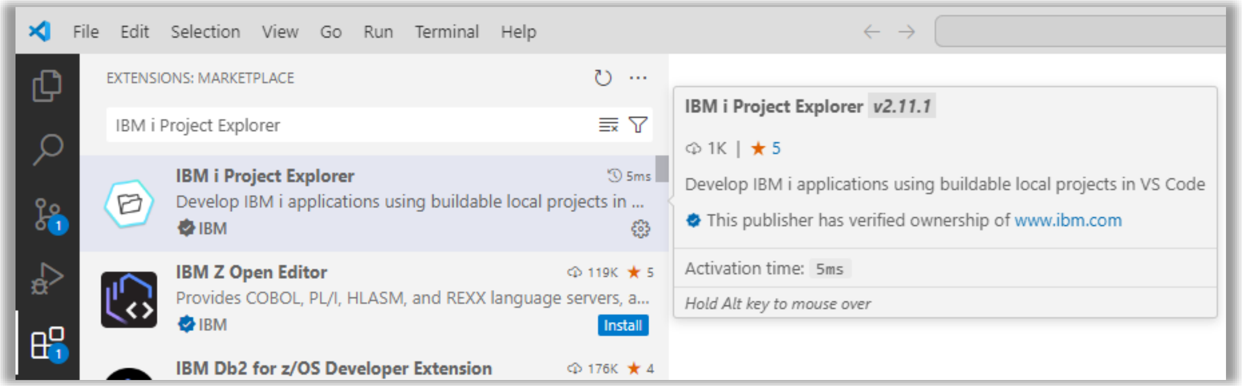
1 *Download*
Visual Studio Code



```
Ctl-Opt nomain;

Dcl-F VATDEF     Keyed usropn;

/copy VAT

Dcl-Pr chainVATDEF;
  P_VATCODE        Char(1)         value;
End-Pr;

Dcl-S K_VATCODE      LIKE(VATCODE);
```

File
Edit
Selection
View
Go
bob-recursive-example
EXPLORER
BOB-RECURSIVE-EXAMPLE
.evfevent
.logs
.vscode
common
functionsVAT
.ibmi.json
fvat.bnd
Rules.mk
vat.rpgleinc
vat300.rpgle
vat300.rpgle
functionsVAT > vat300.rpgle > GetVATRate
VATDEF KEYED USROPN
K_VATCODE LIKE(VATCODE)
GetVATRate EXPORT PACKED(4:2)
P_VATCODE CHAR(1) VALUE
GetVATDesc EXPORT CHAR(20)
P_VATCODE CHAR(1) VALUE
ClcVAT EXPORT PACKED(9:2)
P_VATCODE CHAR(1) VALUE
Net PACKED(9:2) VALUE
tot PACKED(11:4)
ExistVATRate EXPORT IND

2 *Download VS Code extensions*
IBM i Project Explorer,
Source Orbit and *Code for IBM i*
or just the IBM i Development Pack



IBM i Project Explorer v2.11.1

1K | ★ 5

Develop IBM i applications using buildable local projects in VS Code

This publisher has verified ownership of www.ibm.com

Activation time: 5ms

Hold Alt key to mouse over

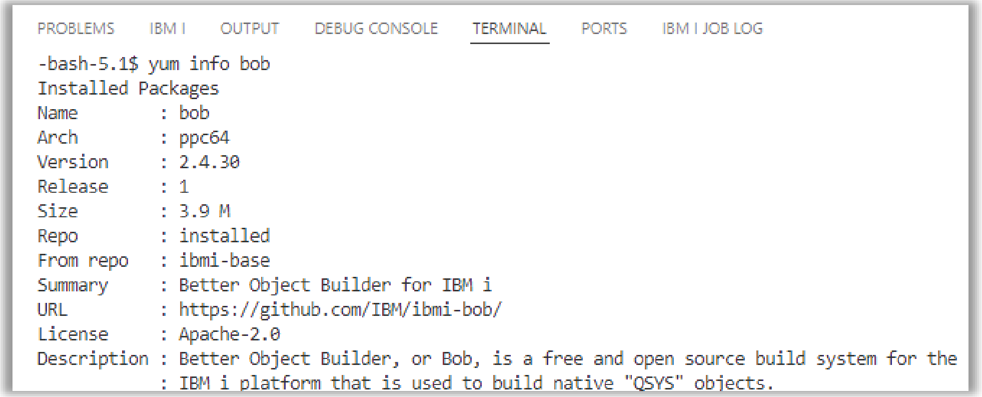
IBM i Project Explorer
Develop IBM i applications using buildable local projects in ...
IBM

IBM Z Open Editor 119K ★ 5
Provides COBOL, PL/I, HLASM, and REXX language servers, a...
IBM

IBM Db2 for z/OS Developer Extension 176K ★ 4

File
Edit
Selection
View
Go
Run
Terminal
Help
EXTENSIONS: MARKETPLACE
IBM i Project Explorer
5ms
Install

3 *Run*
yum install bob
on IBM i



PROBLEMS
IBM I
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
IBM I JOB LOG

```
-bash-5.1$ yum info bob
Installed Packages
Name        : bob
Arch        : ppc64
Version     : 2.4.30
Release     : 1
Size        : 3.9 M
Repo        : installed
From repo   : ibmi-base
Summary     : Better Object Builder for IBM i
URL         : https://github.com/IBM/ibmi-bob/
License     : Apache-2.0
Description : Better Object Builder, or Bob, is a free and open source build system for the
            : IBM i platform that is used to build native "QSYS" objects.
```

Create a New Project

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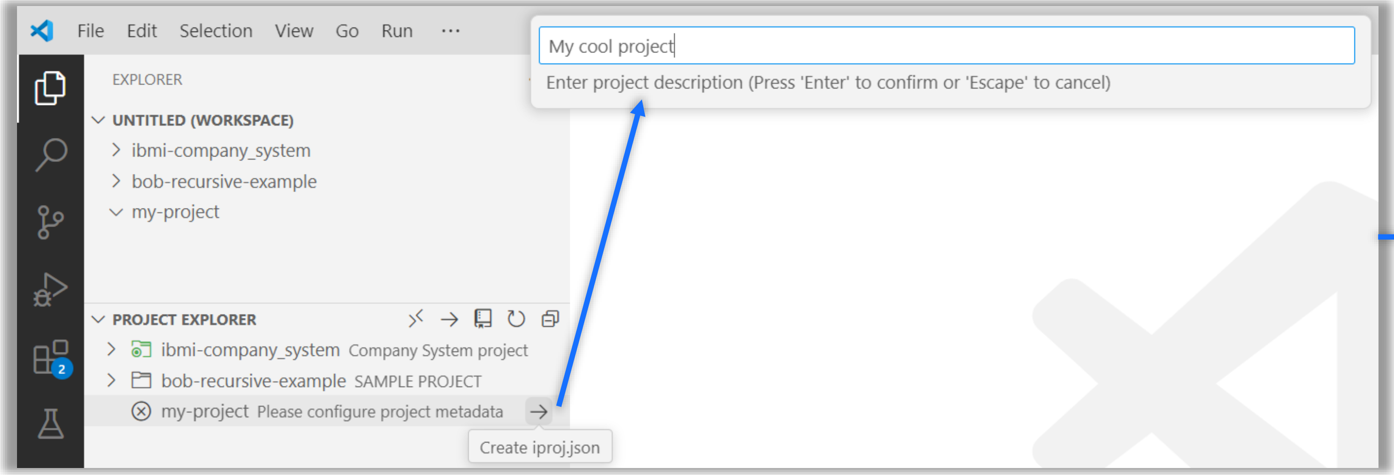
continuous integration

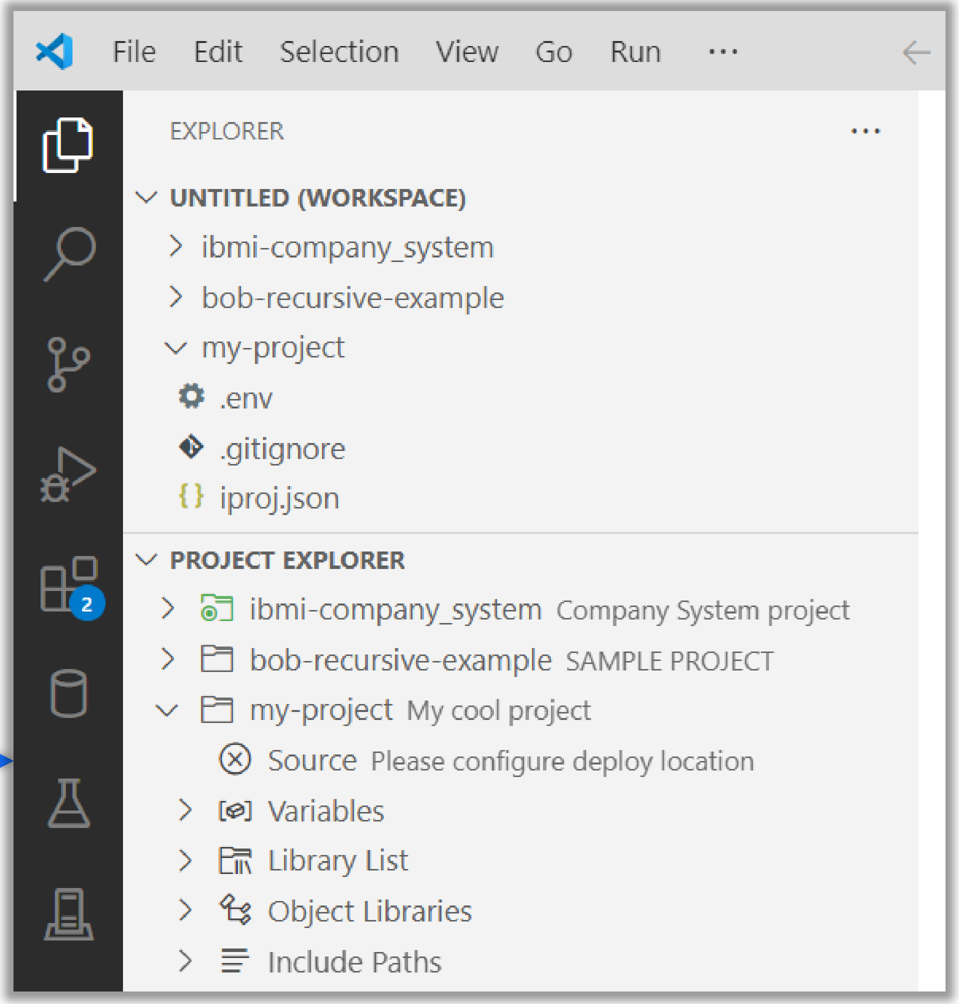
- Create and open a folder for your project
- Create an iproj.json
- Set the project description



My cool project

Enter project description (Press 'Enter' to confirm or 'Escape' to cancel)

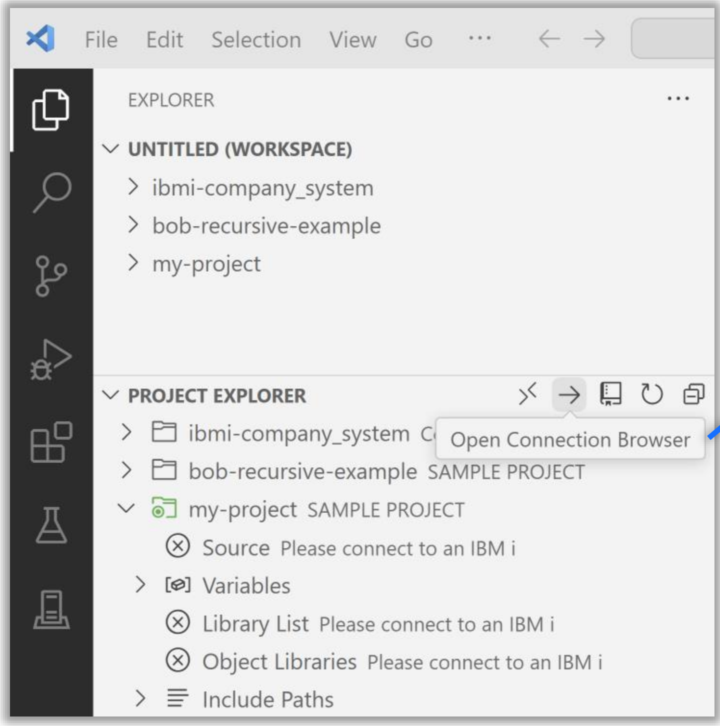
File Edit Selection View Go Run ···
EXPLORER
UNTITLED (WORKSPACE)
ibmi-company_system
bob-recursive-example
my-project
PROJECT EXPLORER
ibmi-company_system Company System project
bob-recursive-example SAMPLE PROJECT
my-project Please configure project metadata
Create iproj.json
2



File Edit Selection View Go Run ···
EXPLORER
UNTITLED (WORKSPACE)
ibmi-company_system
bob-recursive-example
my-project
.env
.gitignore
iproj.json
PROJECT EXPLORER
ibmi-company_system Company System project
bob-recursive-example SAMPLE PROJECT
my-project My cool project
Source Please configure deploy location
Variables
Library List
Object Libraries
Include Paths
2

Connect to an IBM i

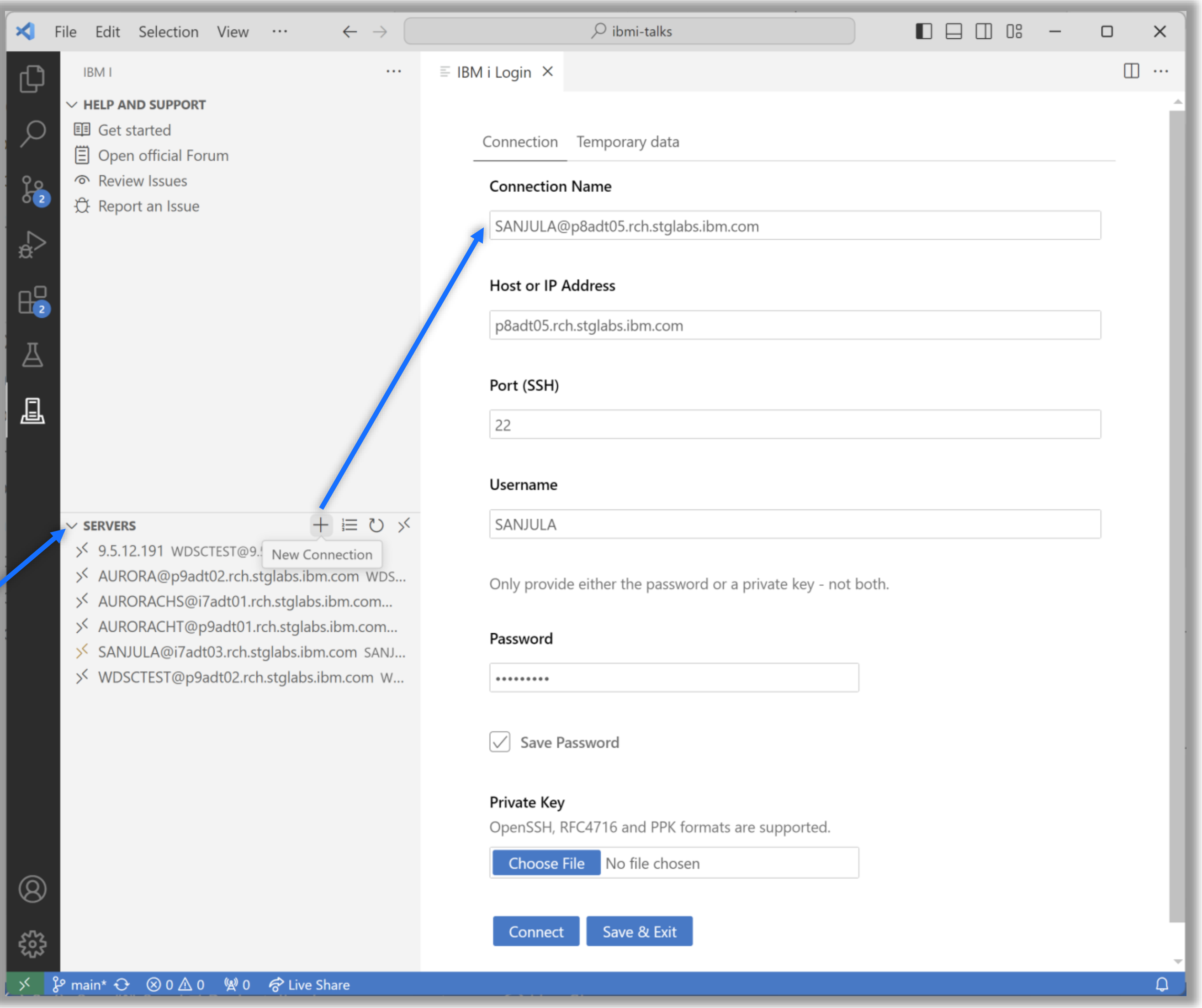
- Open the *Connection Browser* from Project Explorer
- Create new IBM i connection from the *Server* view



EXPLORER

UNTITLED (WORKSPACE)
- ibmi-company_system
- bob-recursive-example
- my-project

PROJECT EXPLORER
- ibmi-company_system
- bob-recursive-example SAMPLE PROJECT
- my-project SAMPLE PROJECT
  - Source Please connect to an IBM i
  - Variables
  - Library List Please connect to an IBM i
  - Object Libraries Please connect to an IBM i
  - Include Paths



HELP AND SUPPORT
- Get started
- Open official Forum
- Review Issues
- Report an Issue

SERVERS
- 9.5.12.191 WDSCTEST@9.
- AURORA@p9adt02.rch.stglabs.ibm.com WDS...
- AURORACHS@i7adt01.rch.stglabs.ibm.com...
- AURORACHT@p9adt01.rch.stglabs.ibm.com...
- SANJULA@i7adt03.rch.stglabs.ibm.com SANJ...
- WDSCTEST@p9adt02.rch.stglabs.ibm.com W...

IBM i Login

Connection | Temporary data

Connection Name: SANJULA@p8adt05.rch.stglabs.ibm.com

Host or IP Address: p8adt05.rch.stglabs.ibm.com

Port (SSH): 22

Username: SANJULA

Only provide either the password or a private key - not both.

Password: •••••••••

☑ Save Password

Private Key
OpenSSH, RFC4716 and PPK formats are supported.
Choose File No file chosen

Connect | Save & Exit

Migrate Source from QSYS

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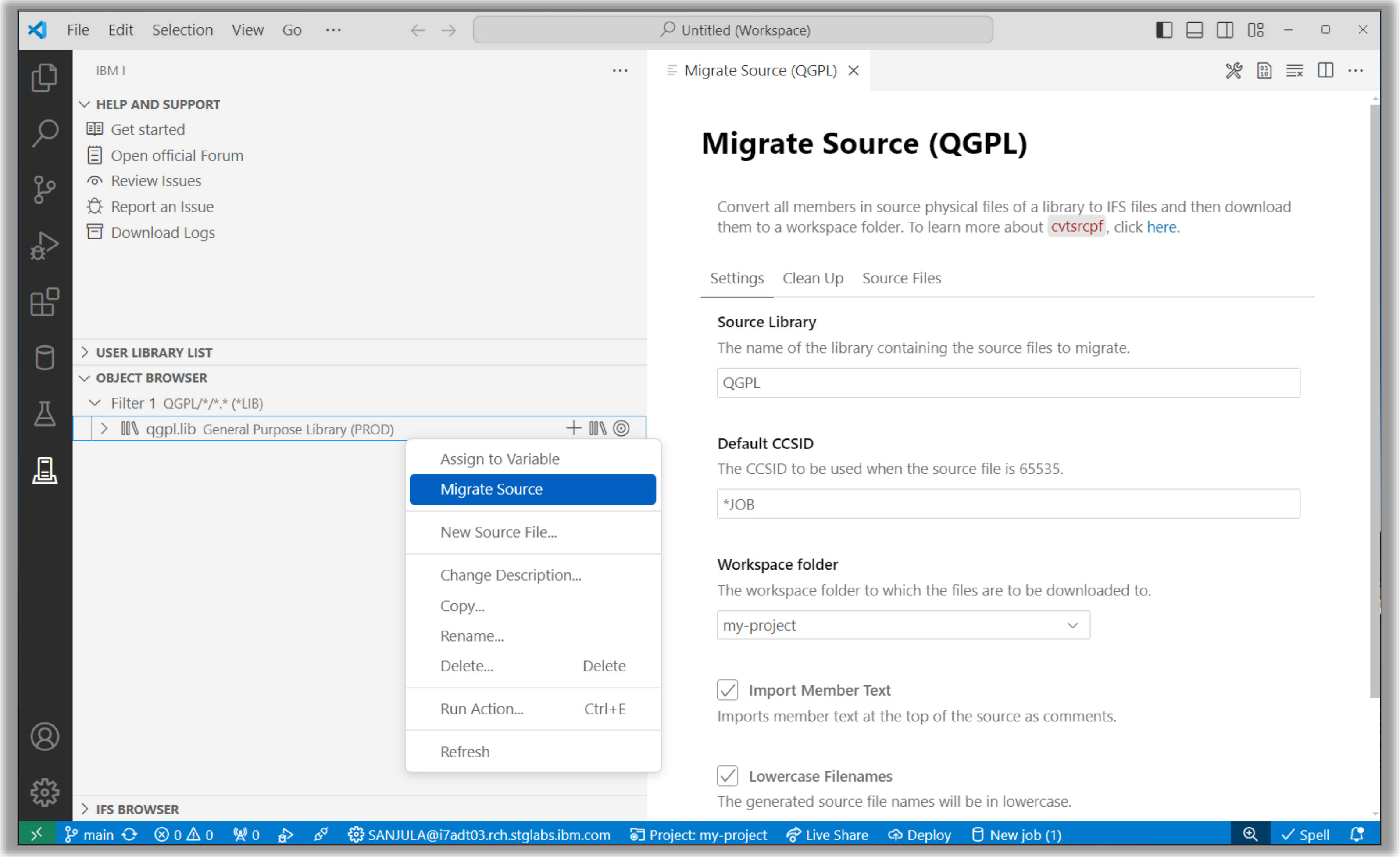
CVTSRCPF from BOB

QSYS members in source physical files
↓
Properly encoded, terminated, and named source files in an IFS directory
↓
Download to local project
↓
Rename extensions
↓
Convert includes/copy directives to Unix style paths

Source Orbit


File
Edit
Selection
View
Go
Untitled (Workspace)
IBM I
HELP AND SUPPORT
Get started
Open official Forum
Review Issues
Report an Issue
Download Logs
USER LIBRARY LIST
OBJECT BROWSER
Filter 1 QGPL/*/*.* (*LIB)
qgpl.lib General Purpose Library (PROD)
Assign to Variable
Migrate Source
New Source File...
Change Description...
Copy...
Rename...
Delete... Delete
Run Action... Ctrl+E
Refresh
IFS BROWSER
Migrate Source (QGPL)
main
SANJULA@i7adt03.rch.stglabs.ibm.com
Project: my-project
Live Share
Deploy
New job (1)
Spell

Migrate Source (QGPL)

Convert all members in source physical files of a library to IFS files and then download them to a workspace folder. To learn more about cvtsrcpf, click here.

Settings | Clean Up | Source Files

Source Library
The name of the library containing the source files to migrate.
QGPL

Default CCSID
The CCSID to be used when the source file is 65535.
*JOB

Workspace folder
The workspace folder to which the files are to be downloaded to.
my-project

☑ **Import Member Text**
Imports member text at the top of the source as comments.

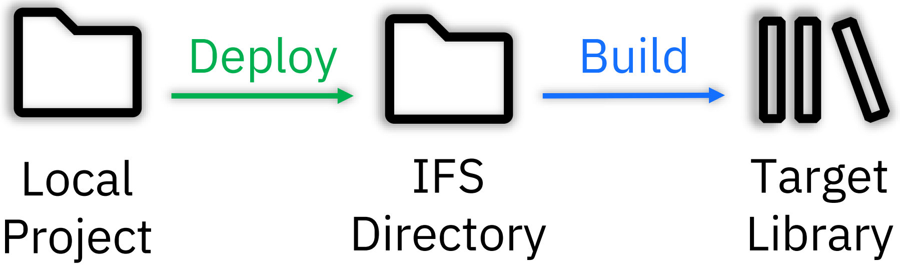
☑ **Lowercase Filenames**
The generated source file names will be in lowercase.

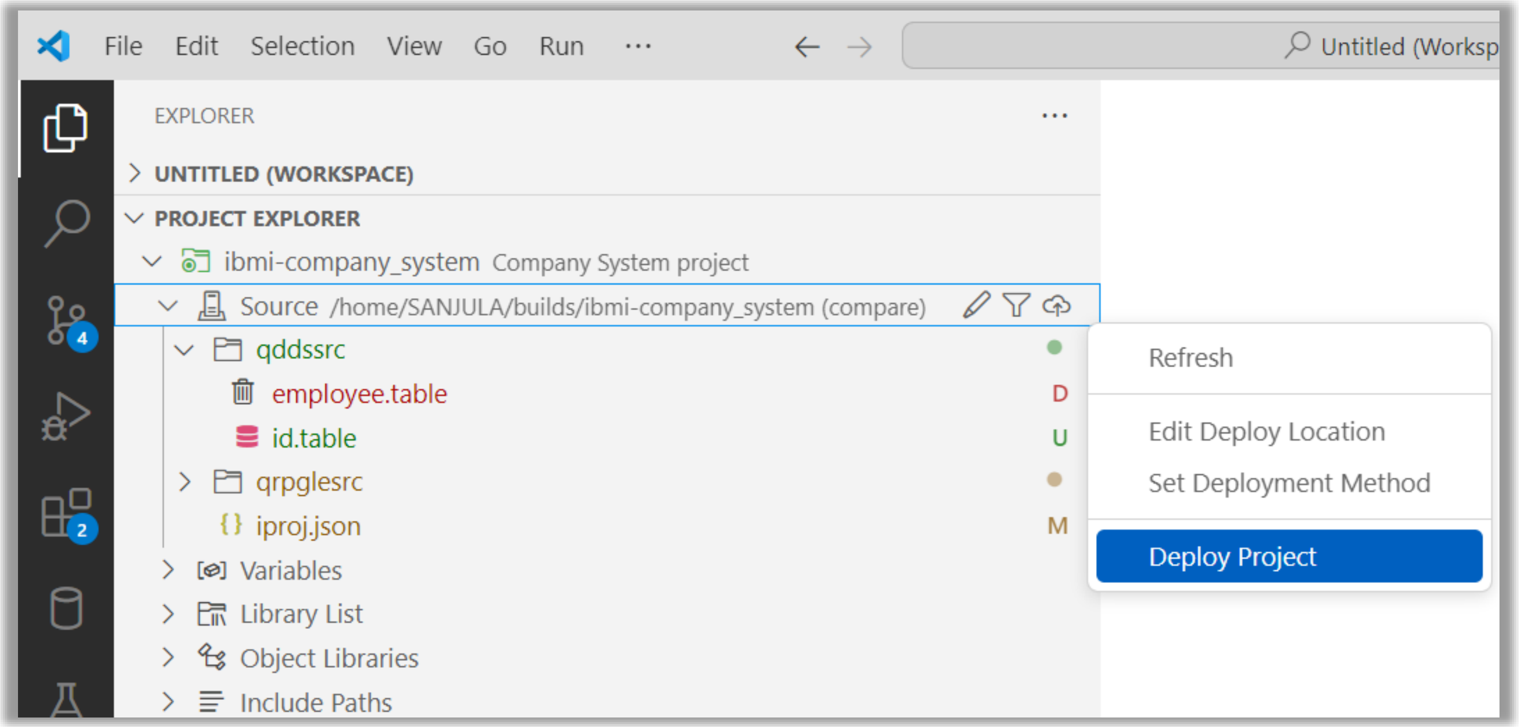
Deployment

- Set deploy location
  - Where source gets uploaded to
  - Typically set one
  - Each developer gets a unique location
  - Each repository gets a unique location

- Set deployment method
  - Compare (typically the safest)
  - Changes (typically the fastest)
  - Working Changes
  - Staged Changes
  - All

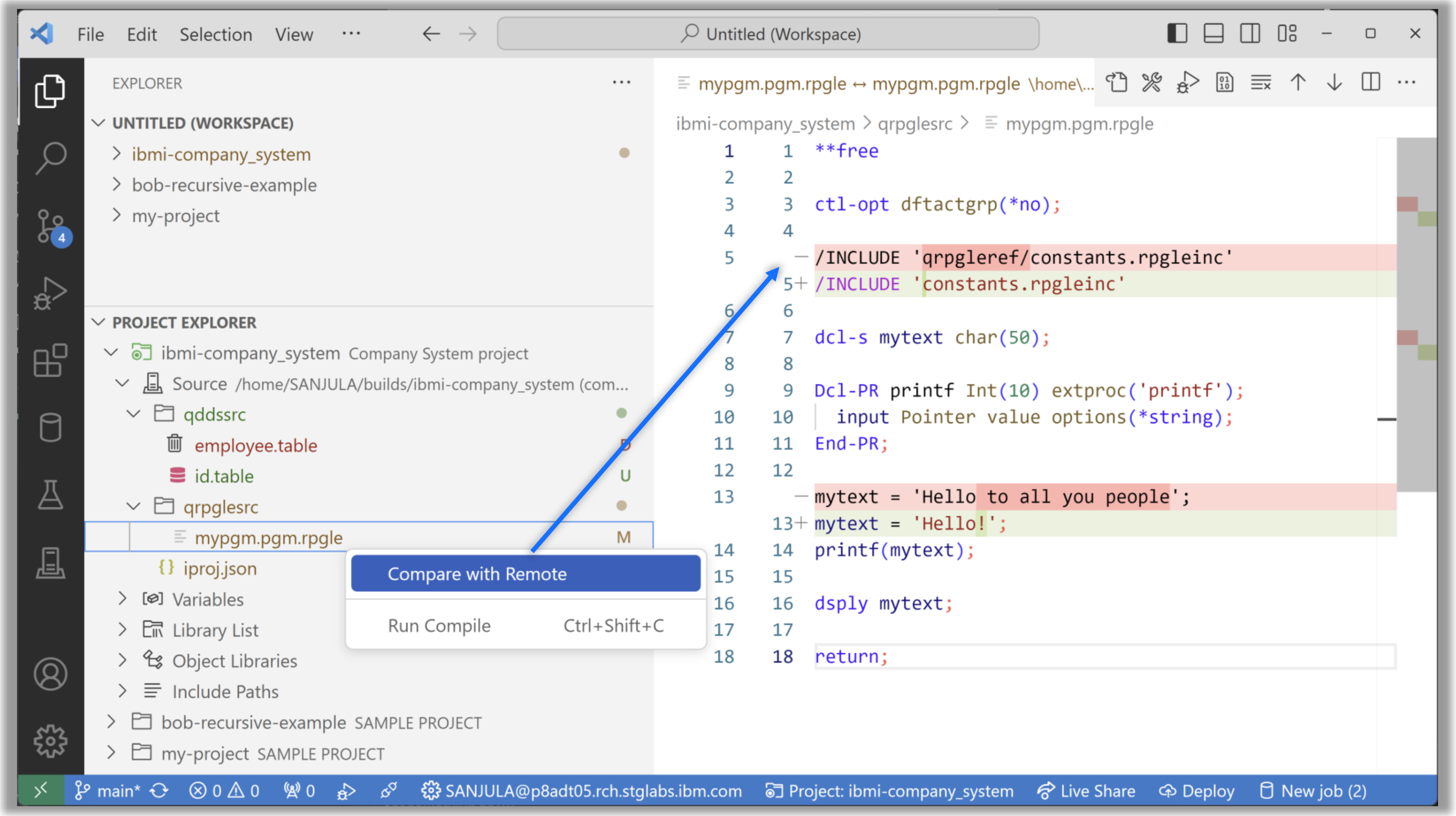
- Deploy project
  - Moves files to deploy location based on deployment method


Deploy
Build
Local Project
IFS Directory
Target Library


File
Edit
Selection
View
Go
Run
Untitled (Worksp
EXPLORER
UNTITLED (WORKSPACE)
PROJECT EXPLORER
ibmi-company_system Company System project
Source /home/SANJULA/builds/ibmi-company_system (compare)
qddssrc
employee.table D
id.table U
qrpglesrc
iproj.json M
Variables
Library List
Object Libraries
Include Paths
Refresh
Edit Deploy Location
Set Deployment Method
Deploy Project

Visualize Local vs. Remote Source Files

- Visualize, compare, and deploy your local source files to the deploy location in the IFS
- Track file changes (added, modified, deleted, etc.)
- Compare local file content with remote IFS


File
Edit
Selection
View
Untitled (Workspace)
EXPLORER
UNTITLED (WORKSPACE)
ibmi-company_system
bob-recursive-example
my-project
PROJECT EXPLORER
ibmi-company_system Company System project
Source /home/SANJULA/builds/ibmi-company_system (com...
qddssrc
employee.table
id.table
U
qrpglesrc
mypgm.pgm.rpgle
M
iproj.json
Variables
Library List
Object Libraries
Include Paths
bob-recursive-example SAMPLE PROJECT
my-project SAMPLE PROJECT
Compare with Remote
Run Compile Ctrl+Shift+C
mypgm.pgm.rpgle ↔ mypgm.pgm.rpgle \home\...
ibmi-company_system > qrpglesrc > mypgm.pgm.rpgle
main*
0 0
0
SANJULA@p8adt05.rch.stglabs.ibm.com
Project: ibmi-company_system
Live Share
Deploy
New job (2)

```
**free

ctl-opt dftactgrp(*no);

— /INCLUDE 'qrpgleref/constants.rpgleinc'
+ /INCLUDE 'constants.rpgleinc'

dcl-s mytext char(50);

Dcl-PR printf Int(10) extproc('printf');
  input Pointer value options(*string);
End-PR;

— mytext = 'Hello to all you people';
+ mytext = 'Hello!';
printf(mytext);

dsply mytext;

return;
```

Work with Variables

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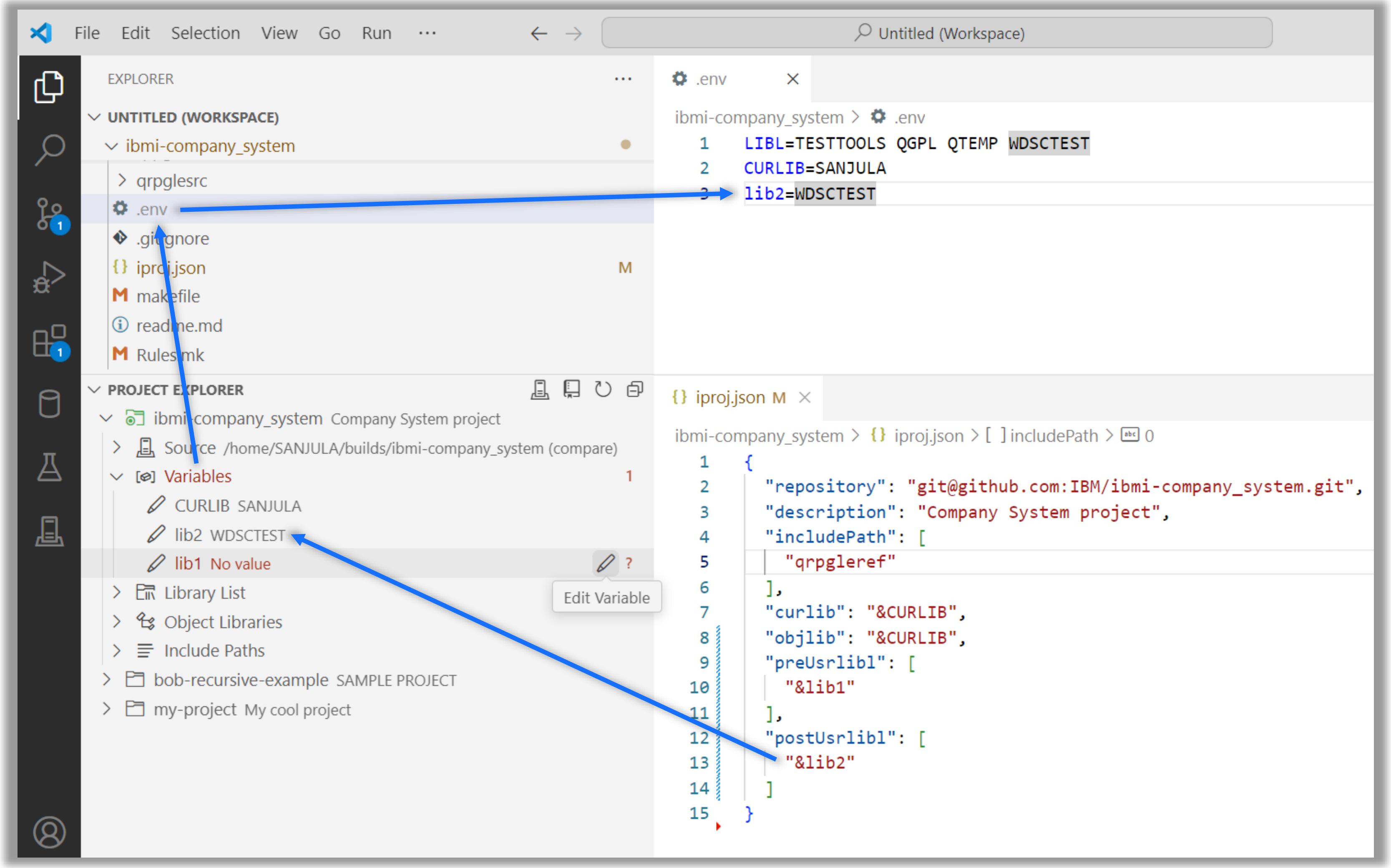
- Reusable project definition that can be used by multiple developers or in automated builds
- View and set variables (for libraries, include paths, or build/compile commands)
- Browse for libraries and assign values to variables
- Configure hardcoded values as variables



File Edit Selection View Go Run ···
Untitled (Workspace)
EXPLORER
UNTITLED (WORKSPACE)
ibmi-company_system
qrpglesrc
.env
.gitignore
iproj.json M
makefile
readme.md
Rules.mk
PROJECT EXPLORER
ibmi-company_system Company System project
Source /home/SANJULA/builds/ibmi-company_system (compare)
Variables 1
CURLIB SANJULA
lib2 WDSCTEST
lib1 No value
Edit Variable
Library List
Object Libraries
Include Paths
bob-recursive-example SAMPLE PROJECT
my-project My cool project
.env
ibmi-company_system > .env
iproj.json M
ibmi-company_system > iproj.json > [ ] includePath > 0

```
LIBL=TESTTOOLS QGPL QTEMP WDSCTEST
CURLIB=SANJULA
lib2=WDSCTEST
```

```
{
  "repository": "git@github.com:IBM/ibmi-company_system.git",
  "description": "Company System project",
  "includePath": [
    "qrpgleref"
  ],
  "curlib": "&CURLIB",
  "objlib": "&CURLIB",
  "preUsrlibl": [
    "&lib1"
  ],
  "postUsrlibl": [
    "&lib2"
  ]
}
```

Do not push .env file to Git!

Manage the Library List

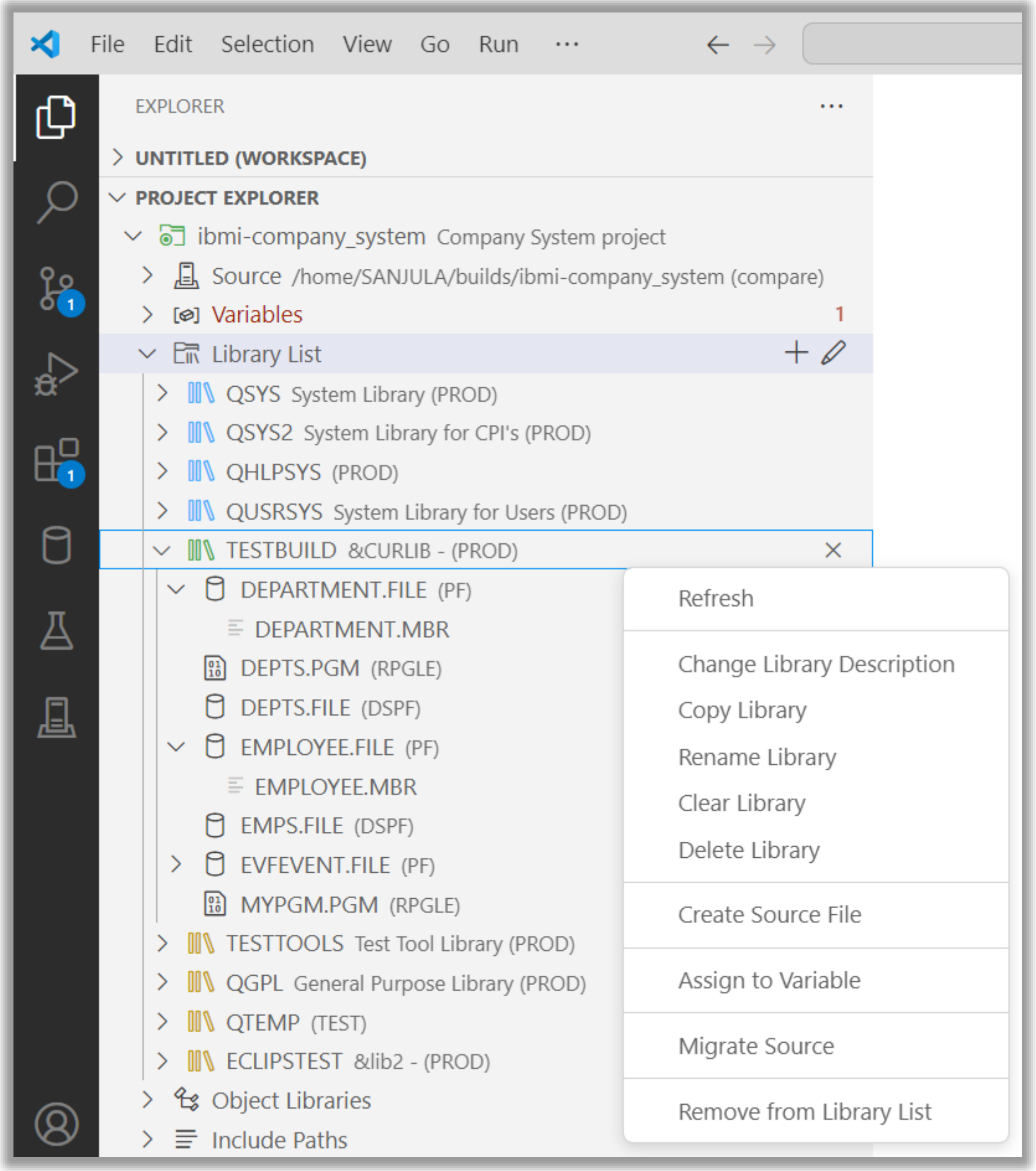
- Project’s library list is a composition of your user profile’s library list (from JOBD) + set of project specific libraries

- Add to beginning/end of library list (*preUsrlibl* and *postUsrlibl*) and set current library (*curlib* in iproj.json)

- Reorder library list

- Browse objects and members

- Manage libraries, objects, and members

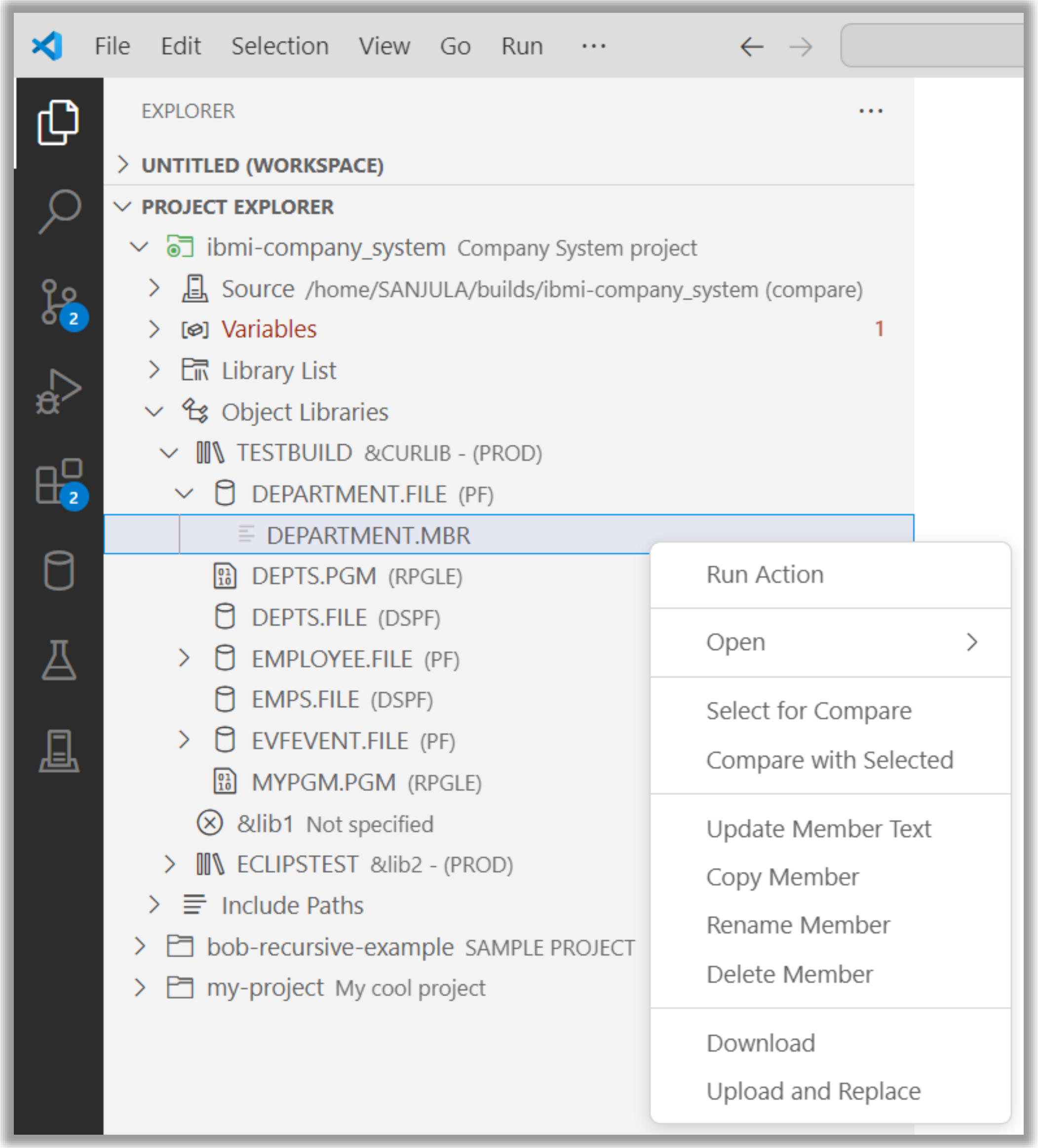

File
Edit
Selection
View
Go
Run
···
EXPLORER
···

UNTITLED (WORKSPACE)
PROJECT EXPLORER
ibmi-company_system Company System project
Source /home/SANJULA/builds/ibmi-company_system (compare)
Variables 1
Library List
QSYS System Library (PROD)
QSYS2 System Library for CPI's (PROD)
QHLPSYS (PROD)
QUSRSYS System Library for Users (PROD)
TESTBUILD &CURLIB - (PROD)
DEPARTMENT.FILE (PF)
DEPARTMENT.MBR
DEPTS.PGM (RPGLE)
DEPTS.FILE (DSPF)
EMPLOYEE.FILE (PF)
EMPLOYEE.MBR
EMPS.FILE (DSPF)
EVFEVENT.FILE (PF)
MYPGM.PGM (RPGLE)
TESTTOOLS Test Tool Library (PROD)
QGPL General Purpose Library (PROD)
QTEMP (TEST)
ECLIPSTEST &lib2 - (PROD)
Object Libraries
Include Paths

Refresh
Change Library Description
Copy Library
Rename Library
Clear Library
Delete Library
Create Source File
Assign to Variable
Migrate Source
Remove from Library List

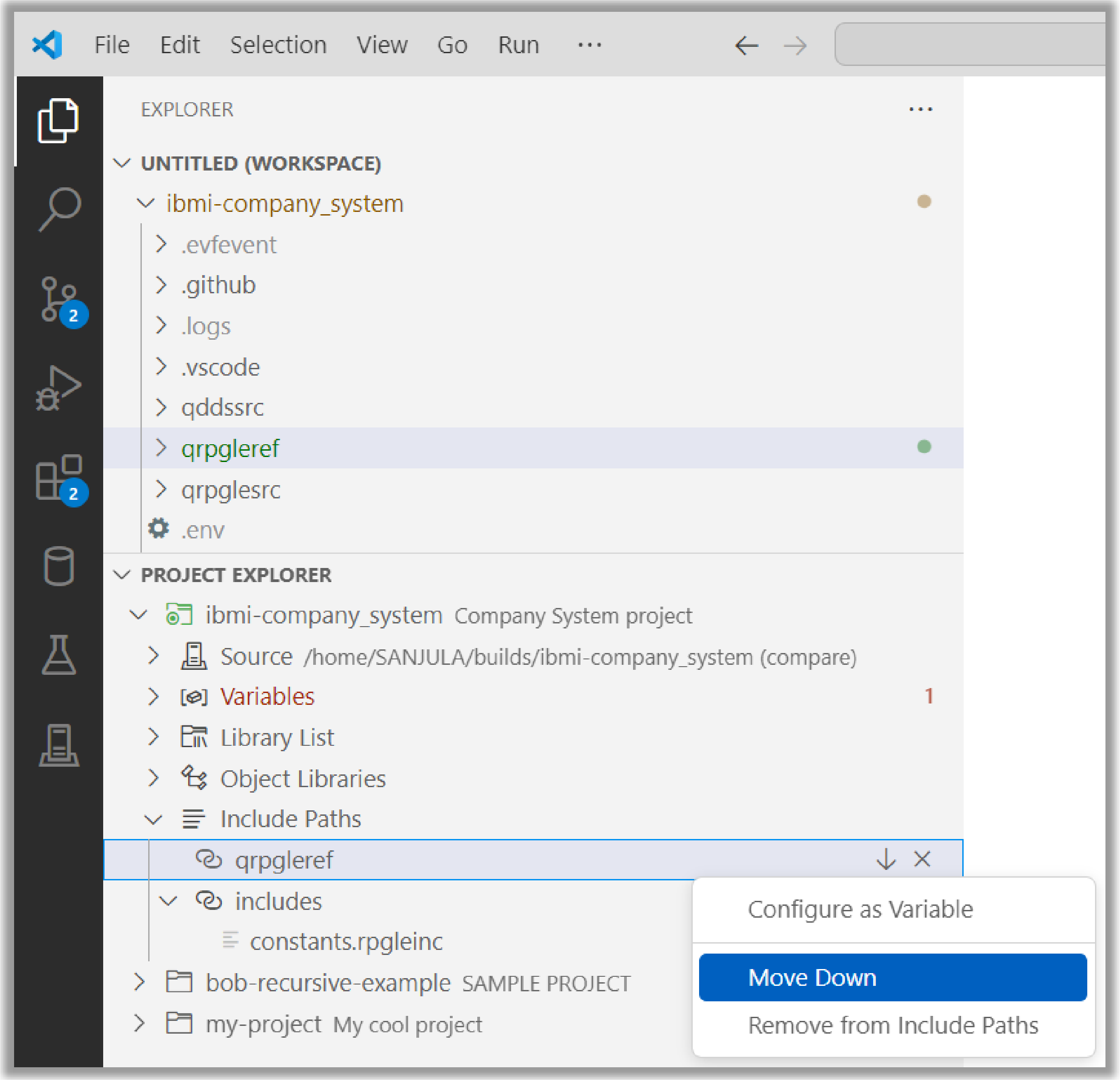
Browse Object Libraries

- The place for developers to easily see, debug, and manipulate the results of your build
- Another place to manage libraries in iproj.json (*curlib*, *objlib*, *preUsrlibl*, *postUsrlibl*)
- Manage libraries, objects, and members


File
Edit
Selection
View
Go
Run
···
EXPLORER
UNTITLED (WORKSPACE)
PROJECT EXPLORER
ibmi-company_system Company System project
Source /home/SANJULA/builds/ibmi-company_system (compare)
Variables 1
Library List
Object Libraries
TESTBUILD &CURLIB - (PROD)
DEPARTMENT.FILE (PF)
DEPARTMENT.MBR
DEPTS.PGM (RPGLE)
DEPTS.FILE (DSPF)
EMPLOYEE.FILE (PF)
EMPS.FILE (DSPF)
EVFEVENT.FILE (PF)
MYPGM.PGM (RPGLE)
&lib1 Not specified
ECLIPSTEST &lib2 - (PROD)
Include Paths
bob-recursive-example SAMPLE PROJECT
my-project My cool project
Run Action
Open
Select for Compare
Compare with Selected
Update Member Text
Copy Member
Rename Member
Delete Member
Download
Upload and Replace

Manage Include Paths

- Self-contained projects should know where to find includes within the project
- Add, remove, and reorder include paths
- Visualize if includes resolve locally or to remote IFS


File
Edit
Selection
View
Go
Run
EXPLORER
UNTITLED (WORKSPACE)
ibmi-company_system
.evfevent
.github
.logs
.vscode
qddssrc
qrpgleref
qrpglesrc
.env
PROJECT EXPLORER
ibmi-company_system Company System project
Source /home/SANJULA/builds/ibmi-company_system (compare)
Variables
1
Library List
Object Libraries
Include Paths
qrpgleref
includes
constants.rpgleinc
bob-recursive-example SAMPLE PROJECT
my-project My cool project
Configure as Variable
Move Down
Remove from Include Paths
2
2

Build and Compile

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continuous integration

1 Deploy

↓

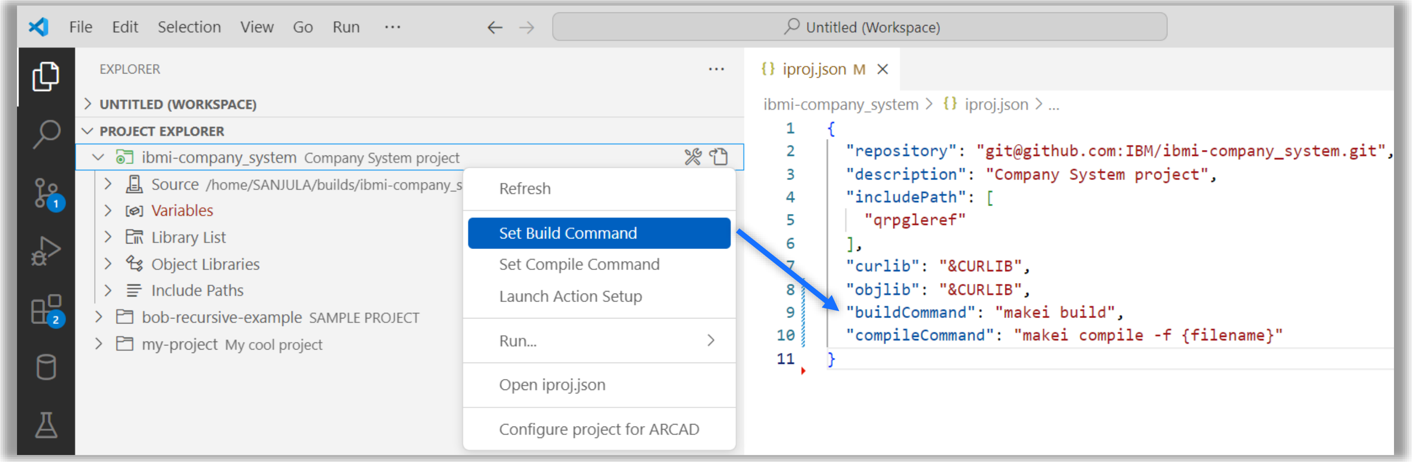
2 Run build or compile command
(any build framework)

↓

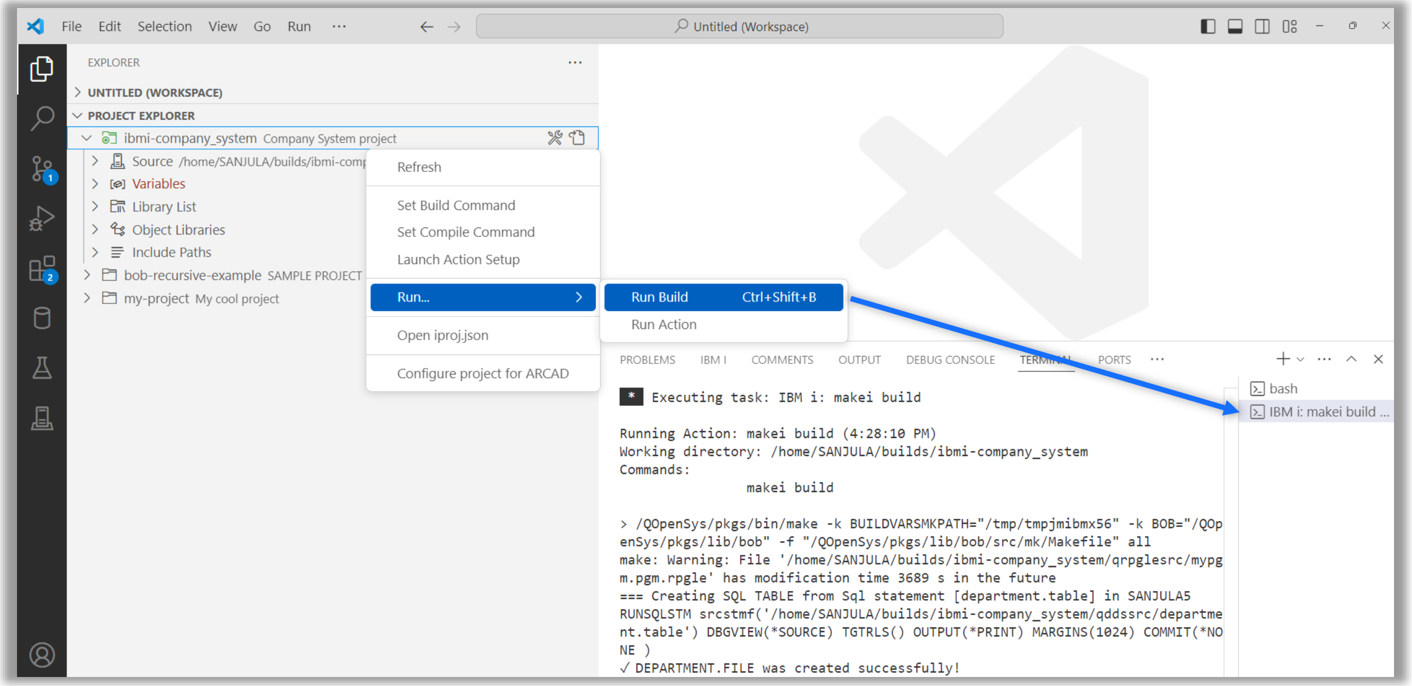
3 Download logs and evfevent files

- Building
    - Set build command
    - Run Build (*Ctrl+Shift+b* or *Cmd+Shift+b*)

- Compiling
    - Set compile command
    - Run compile (*Ctrl+Shift+c* or *Cmd+Shift+c*)
        - On active editor
        - On file or directory in File Explorer
        - On file or directory in Source


File Edit Selection View Go Run ···
Untitled (Workspace)
EXPLORER
UNTITLED (WORKSPACE)
PROJECT EXPLORER
ibmi-company_system Company System project
Source /home/SANJULA/builds/ibmi-company_s
Variables
Library List
Object Libraries
Include Paths
bob-recursive-example SAMPLE PROJECT
my-project My cool project
Refresh
Set Build Command
Set Compile Command
Launch Action Setup
Run...
Open iproj.json
Configure project for ARCAD
iproj.json M
ibmi-company_system > {} iproj.json > ...

```json
{
  "repository": "git@github.com:IBM/ibmi-company_system.git",
  "description": "Company System project",
  "includePath": [
    "qrpgleref"
  ],
  "curlib": "&CURLIB",
  "objlib": "&CURLIB",
  "buildCommand": "makei build",
  "compileCommand": "makei compile -f {filename}"
}
```


File Edit Selection View Go Run ···
Untitled (Workspace)
EXPLORER
UNTITLED (WORKSPACE)
PROJECT EXPLORER
ibmi-company_system Company System project
Source /home/SANJULA/builds/ibmi-comp
Variables
Library List
Object Libraries
Include Paths
bob-recursive-example SAMPLE PROJECT
my-project My cool project
Refresh
Set Build Command
Set Compile Command
Launch Action Setup
Run...
Open iproj.json
Configure project for ARCAD
Run Build Ctrl+Shift+B
Run Action
PROBLEMS IBM I COMMENTS OUTPUT DEBUG CONSOLE TERMINAL PORTS ···
bash
IBM i: makei build ...

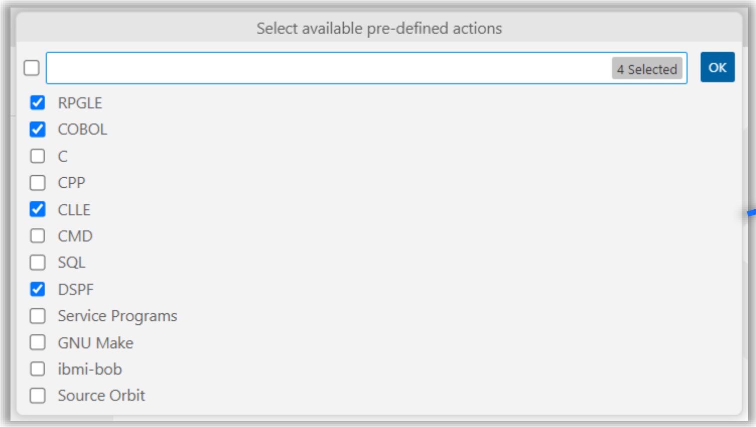
```
 *  Executing task: IBM i: makei build

Running Action: makei build (4:28:10 PM)
Working directory: /home/SANJULA/builds/ibmi-company_system
Commands:
                makei build

> /QOpenSys/pkgs/bin/make -k BUILDVARSMKPATH="/tmp/tmpjmibmx56" -k BOB="/QOp
enSys/pkgs/lib/bob" -f "/QOpenSys/pkgs/lib/bob/src/mk/Makefile" all
make: Warning: File '/home/SANJULA/builds/ibmi-company_system/qrpglesrc/mypg
m.pgm.rpgle' has modification time 3689 s in the future
=== Creating SQL TABLE from Sql statement [department.table] in SANJULA5
RUNSQLSTM srcstmf('/home/SANJULA/builds/ibmi-company_system/qddssrc/departme
nt.table') DBGVIEW(*SOURCE) TGTRLS() OUTPUT(*PRINT) MARGINS(1024) COMMIT(*NO
NE )
✓ DEPARTMENT.FILE was created successfully!
```

Run Actions

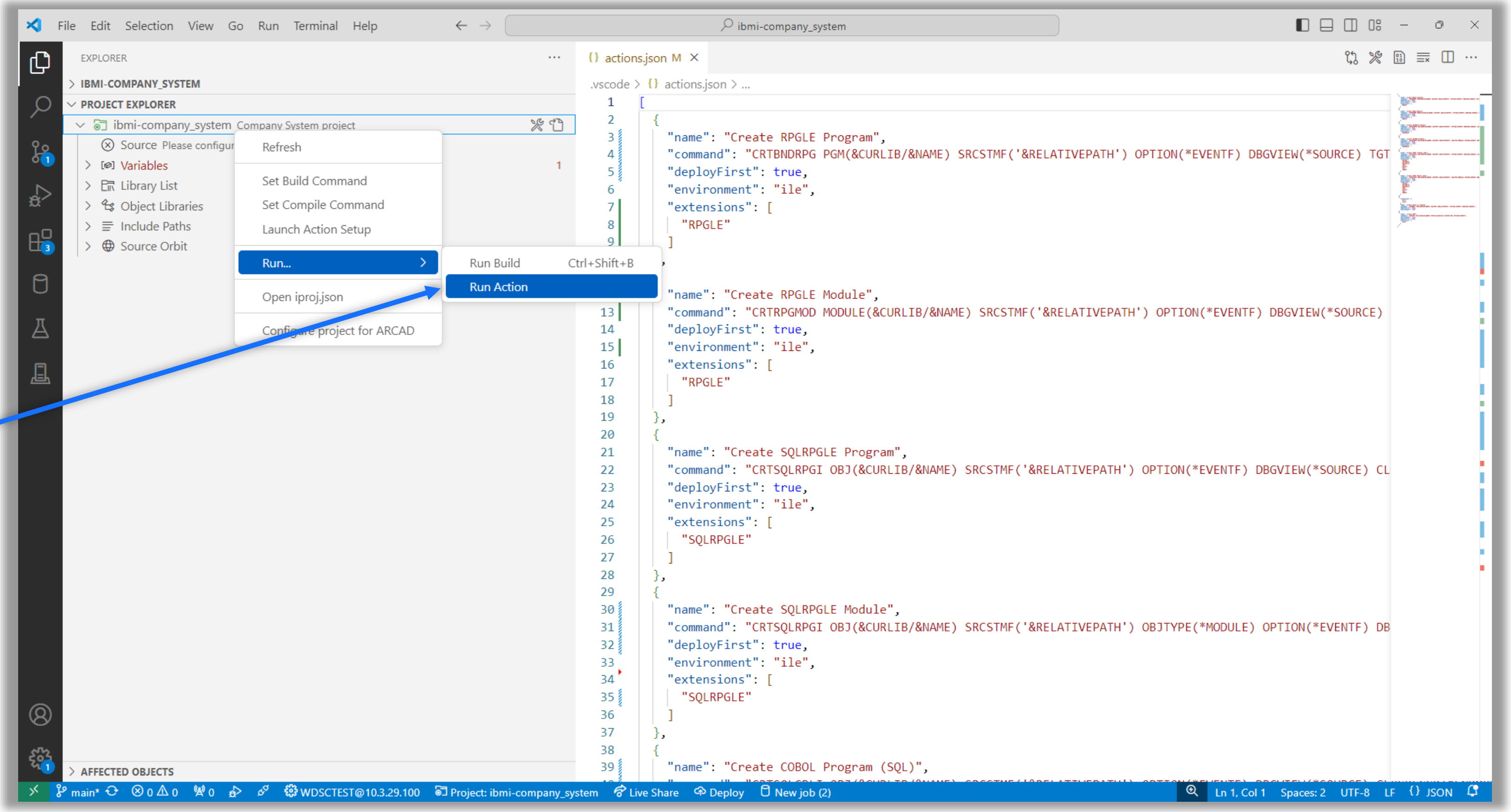
IBM i Project Explorer also supports running Code for IBM i's custom workspace actions



Select available pre-defined actions

☐ 4 Selected OK

- ☑ RPGLE
- ☑ COBOL
- ☐ C
- ☐ CPP
- ☑ CLLE
- ☐ CMD
- ☐ SQL
- ☑ DSPF
- ☐ Service Programs
- ☐ GNU Make
- ☐ ibmi-bob
- ☐ Source Orbit



File
Edit
Selection
View
Go
Run
Terminal
Help
ibmi-company_system
EXPLORER
IBMI-COMPANY_SYSTEM
PROJECT EXPLORER
ibmi-company_system Company System project
Source Please configur
Variables
1
Library List
Object Libraries
Include Paths
Source Orbit
Refresh
Set Build Command
Set Compile Command
Launch Action Setup
Run...
Run Build Ctrl+Shift+B
Run Action
Open iproj.json
Configure project for ARCAD
AFFECTED OBJECTS
actions.json M
.vscode > actions.json > ...

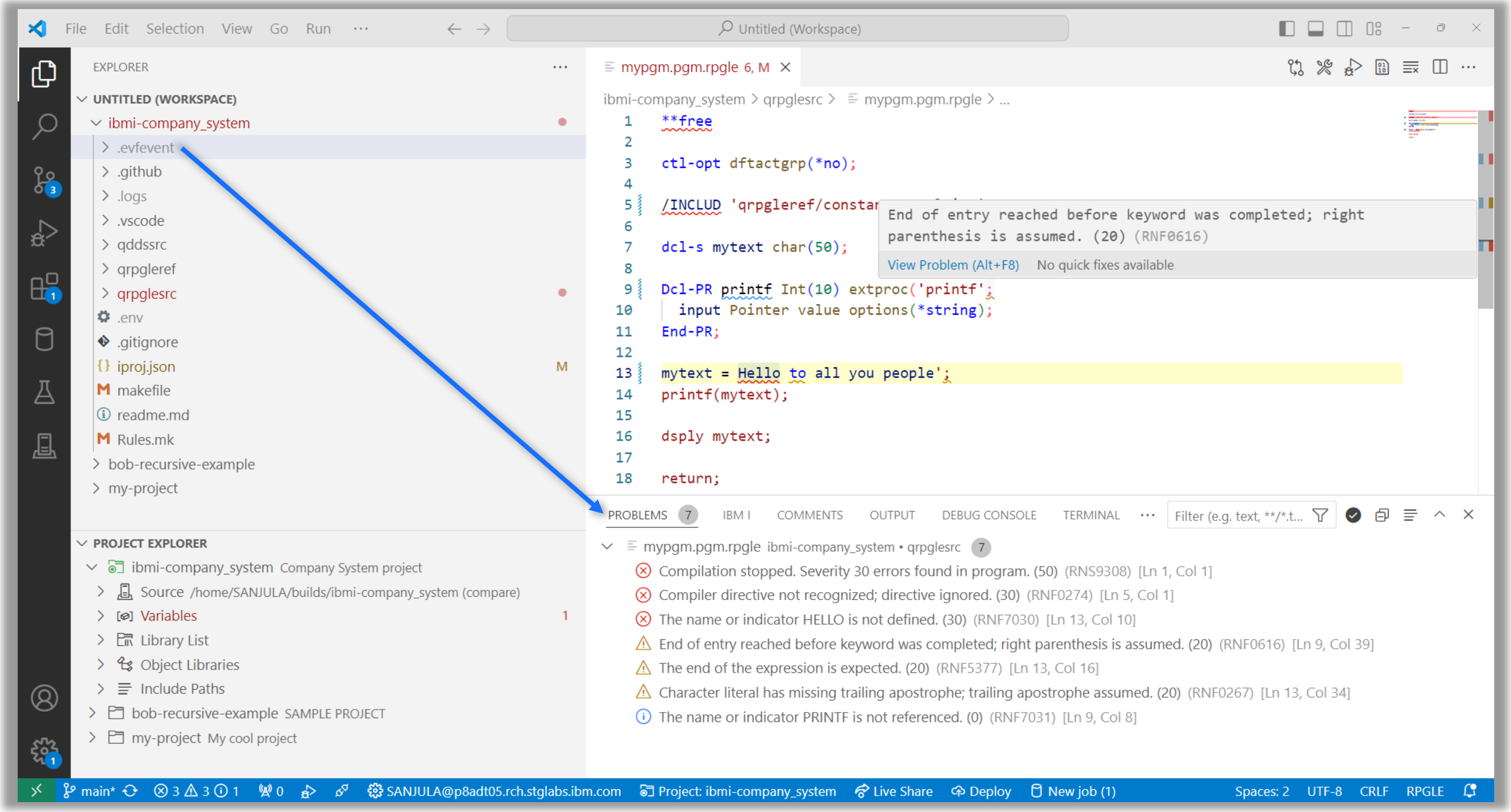
```
[
  {
    "name": "Create RPGLE Program",
    "command": "CRTBNDRPG PGM(&CURLIB/&NAME) SRCSTMF('&RELATIVEPATH') OPTION(*EVENTF) DBGVIEW(*SOURCE) TGT
    "deployFirst": true,
    "environment": "ile",
    "extensions": [
      "RPGLE"
    ]
    "name": "Create RPGLE Module",
    "command": "CRTRPGMOD MODULE(&CURLIB/&NAME) SRCSTMF('&RELATIVEPATH') OPTION(*EVENTF) DBGVIEW(*SOURCE)
    "deployFirst": true,
    "environment": "ile",
    "extensions": [
      "RPGLE"
    ]
  },
  {
    "name": "Create SQLRPGLE Program",
    "command": "CRTSQLRPGI OBJ(&CURLIB/&NAME) SRCSTMF('&RELATIVEPATH') OPTION(*EVENTF) DBGVIEW(*SOURCE) CL
    "deployFirst": true,
    "environment": "ile",
    "extensions": [
      "SQLRPGLE"
    ]
  },
  {
    "name": "Create SQLRPGLE Module",
    "command": "CRTSQLRPGI OBJ(&CURLIB/&NAME) SRCSTMF('&RELATIVEPATH') OBJTYPE(*MODULE) OPTION(*EVENTF) DB
    "deployFirst": true,
    "environment": "ile",
    "extensions": [
      "SQLRPGLE"
    ]
  },
  {
    "name": "Create COBOL Program (SQL)",
```

main*
0 0
0
WDSCTEST@10.3.29.100
Project: ibmi-company_system
Live Share
Deploy
New job (2)
Ln 1, Col 1
Spaces: 2
UTF-8
LF
JSON

View Diagnostics

IBM i
continuous innovation
continuous integration

- Visualize build or compile diagnostics in the Problems view
- Evfevent file diagnostics are dumped in a .evfevent directory after a build or compile
- Diagnostics are also rendered inline in the source file


File
Edit
Selection
View
Go
Run
Untitled (Workspace)
EXPLORER
UNTITLED (WORKSPACE)
ibmi-company_system
.evfevent
.github
.logs
.vscode
qddssrc
qrpgleref
qrpglesrc
.env
.gitignore
iproj.json
M
makefile
readme.md
Rules.mk
bob-recursive-example
my-project
PROJECT EXPLORER
ibmi-company_system Company System project
Source /home/SANJULA/builds/ibmi-company_system (compare)
Variables
1
Library List
Object Libraries
Include Paths
bob-recursive-example SAMPLE PROJECT
my-project My cool project
mypgm.pgm.rpgle 6, M
ibmi-company_system > qrpglesrc > mypgm.pgm.rpgle > ...
PROBLEMS 7
IBM I
COMMENTS
OUTPUT
DEBUG CONSOLE
TERMINAL
Filter (e.g. text, **/*.t...
main*
⊗ 3 ⚠ 3 ⓘ 1
0
SANJULA@p8adt05.rch.stglabs.ibm.com
Project: ibmi-company_system
Live Share
Deploy
New job (1)
Spaces: 2
UTF-8
CRLF
RPGLE

```
1   **free
2
3   ctl-opt dftactgrp(*no);
4
5   /INCLUD 'qrpgleref/constar
6
7   dcl-s mytext char(50);
8
9   Dcl-PR printf Int(10) extproc('printf';
10    input Pointer value options(*string);
11  End-PR;
12
13  mytext = Hello to all you people';
14  printf(mytext);
15
16  dsply mytext;
17
18  return;
```

End of entry reached before keyword was completed; right parenthesis is assumed. (20) (RNF0616)

View Problem (Alt+F8) No quick fixes available

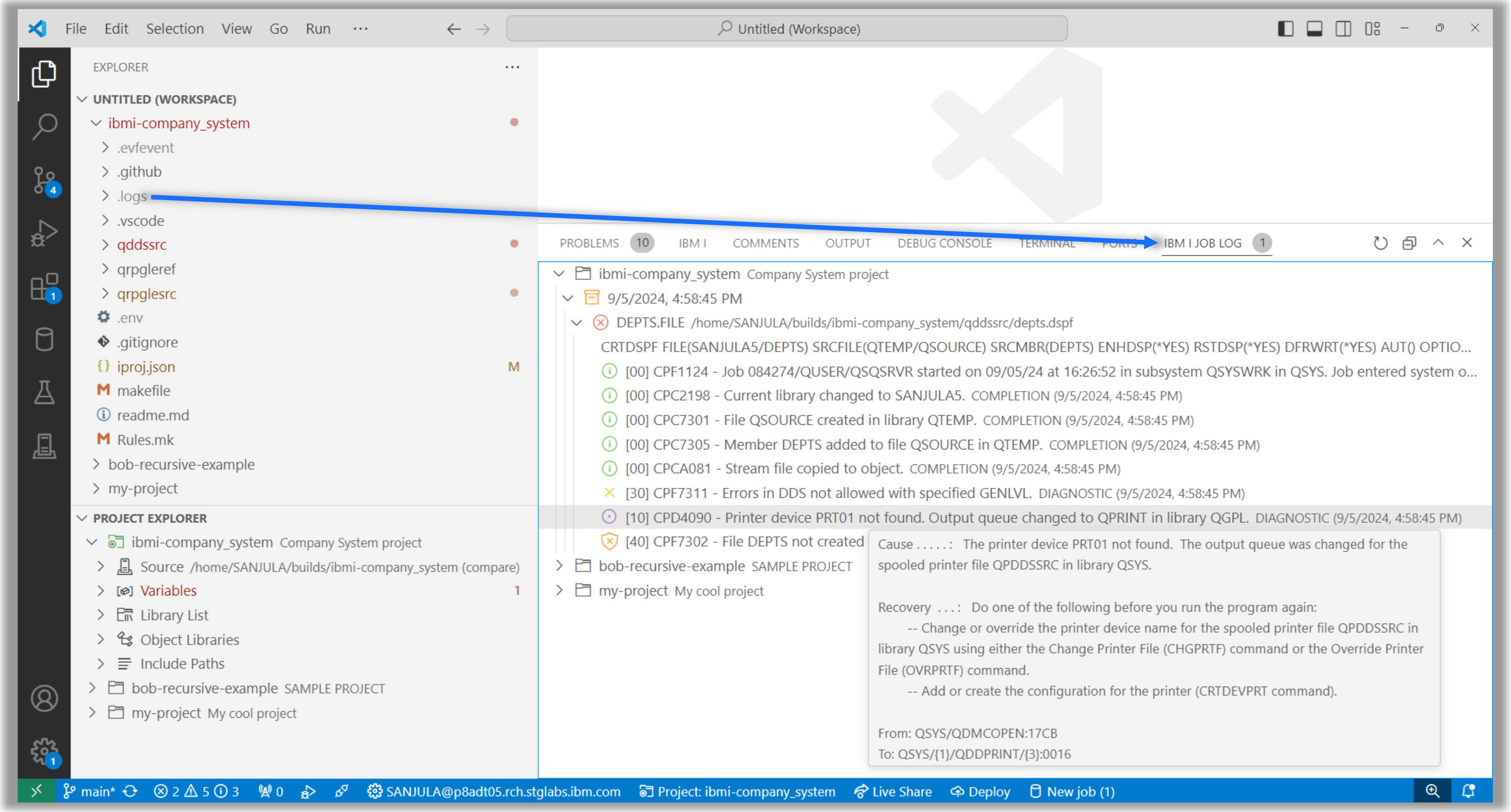
mypgm.pgm.rpgle ibmi-company_system • qrpglesrc 7

- ⊗ Compilation stopped. Severity 30 errors found in program. (50) (RNS9308) [Ln 1, Col 1]
- ⊗ Compiler directive not recognized; directive ignored. (30) (RNF0274) [Ln 5, Col 1]
- ⊗ The name or indicator HELLO is not defined. (30) (RNF7030) [Ln 13, Col 10]
- ⚠ End of entry reached before keyword was completed; right parenthesis is assumed. (20) (RNF0616) [Ln 9, Col 39]
- ⚠ The end of the expression is expected. (20) (RNF5377) [Ln 13, Col 16]
- ⚠ Character literal has missing trailing apostrophe; trailing apostrophe assumed. (20) (RNF0267) [Ln 13, Col 34]
- ⓘ The name or indicator PRINTF is not referenced. (0) (RNF7031) [Ln 9, Col 8]

View Job Logs

IBM i
continuous innovation
continuous integration

- Visualize and manage anything that could be seen in an IBM i job log including second level help
- Job log and spool files are dumped in .logs directory after a build or compile
- Track up to 10 of the previous logs in memory
- Organized by the ILE objects being built
- Filter by failed objects or severity


File
Edit
Selection
View
Go
Run
Untitled (Workspace)
EXPLORER
UNTITLED (WORKSPACE)
ibmi-company_system
.evfevent
.github
.logs
.vscode
qddssrc
qrpglerf
qrpglesrc
.env
.gitignore
iproj.json
M
makefile
readme.md
Rules.mk
bob-recursive-example
my-project
PROJECT EXPLORER
ibmi-company_system Company System project
Source /home/SANJULA/builds/ibmi-company_system (compare)
Variables
1
Library List
Object Libraries
Include Paths
bob-recursive-example SAMPLE PROJECT
my-project My cool project
PROBLEMS 10
IBM I
COMMENTS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
IBM I JOB LOG 1
main*
2 5 3
0
SANJULA@p8adt05.rch.stglabs.ibm.com
Project: ibmi-company_system
Live Share
Deploy
New job (1)

```
ibmi-company_system  Company System project
  9/5/2024, 4:58:45 PM
    DEPTS.FILE  /home/SANJULA/builds/ibmi-company_system/qddssrc/depts.dspf
      CRTDSPF FILE(SANJULA5/DEPTS) SRCFILE(QTEMP/QSOURCE) SRCMBR(DEPTS) ENHDSP(*YES) RSTDSP(*YES) DFRWRT(*YES) AUT() OPTIO...
      [00] CPF1124 - Job 084274/QUSER/QSQSRVR started on 09/05/24 at 16:26:52 in subsystem QSYSWRK in QSYS. Job entered system o...
      [00] CPC2198 - Current library changed to SANJULA5.  COMPLETION (9/5/2024, 4:58:45 PM)
      [00] CPC7301 - File QSOURCE created in library QTEMP.  COMPLETION (9/5/2024, 4:58:45 PM)
      [00] CPC7305 - Member DEPTS added to file QSOURCE in QTEMP.  COMPLETION (9/5/2024, 4:58:45 PM)
      [00] CPCA081 - Stream file copied to object.  COMPLETION (9/5/2024, 4:58:45 PM)
      [30] CPF7311 - Errors in DDS not allowed with specified GENLVL.  DIAGNOSTIC (9/5/2024, 4:58:45 PM)
      [10] CPD4090 - Printer device PRT01 not found. Output queue changed to QPRINT in library QGPL.  DIAGNOSTIC (9/5/2024, 4:58:45 PM)
      [40] CPF7302 - File DEPTS not created
bob-recursive-example  SAMPLE PROJECT
my-project  My cool project
```

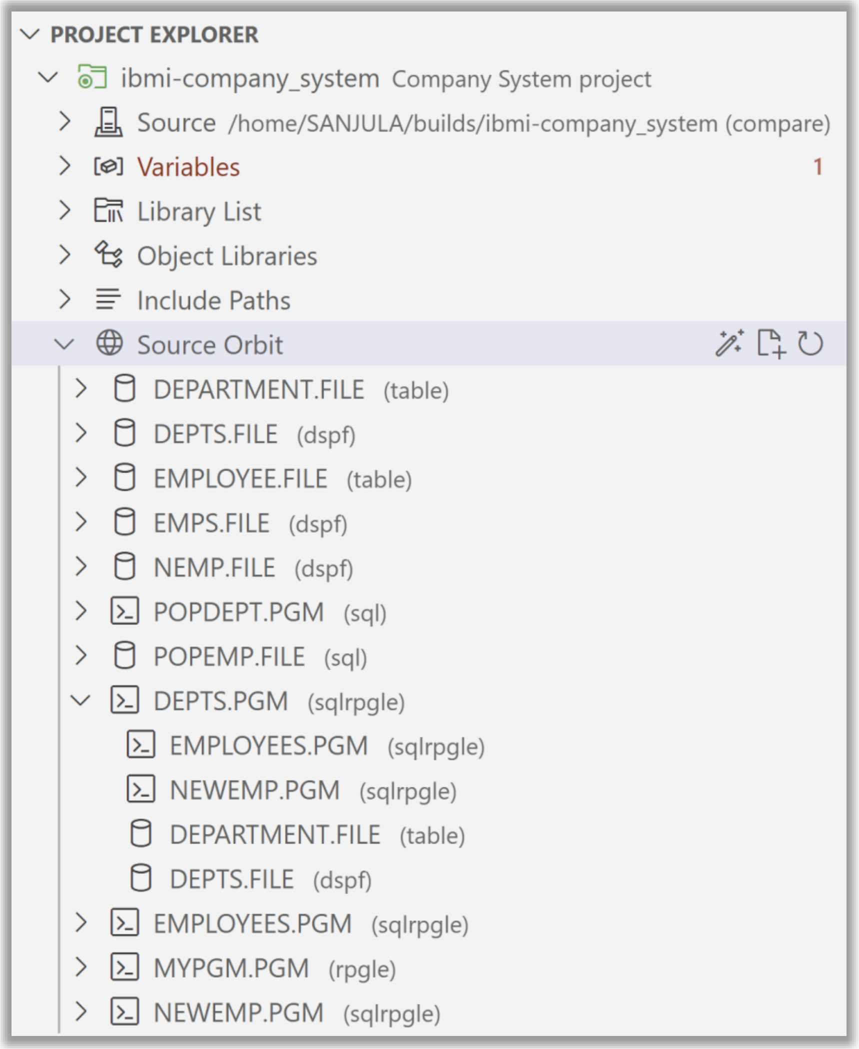
```
Cause . . . . . :   The printer device PRT01 not found.  The output queue was changed for the
spooled printer file QPDDSSRC in library QSYS.

Recovery  . . . :   Do one of the following before you run the program again:
      -- Change or override the printer device name for the spooled printer file QPDDSSRC in
library QSYS using either the Change Printer File (CHGPRTF) command or the Override Printer
File (OVRPRTF) command.
      -- Add or create the configuration for the printer (CRTDEVPRT command).

From: QSYS/QDMCOPEN:17CB
To: QSYS/{1}/QDDPRINT/{3}:0016
```

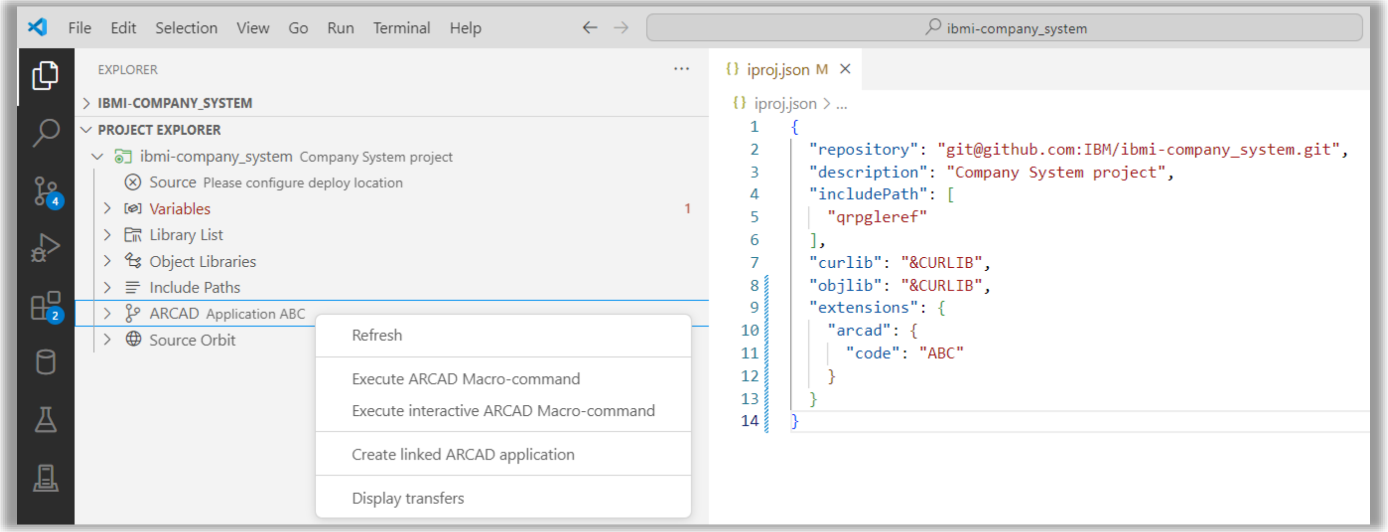
Integration

Source Orbit



- PROJECT EXPLORER
  - ibmi-company_system Company System project
    - Source /home/SANJULA/builds/ibmi-company_system (compare)
    - Variables 1
    - Library List
    - Object Libraries
    - Include Paths
    - Source Orbit
      - DEPARTMENT.FILE (table)
      - DEPTS.FILE (dspf)
      - EMPLOYEE.FILE (table)
      - EMPS.FILE (dspf)
      - NEMP.FILE (dspf)
      - POPDEPT.PGM (sql)
      - POPEMP.FILE (sql)
      - DEPTS.PGM (sqlrpgle)
        - EMPLOYEES.PGM (sqlrpgle)
        - NEWEMP.PGM (sqlrpgle)
        - DEPARTMENT.FILE (table)
        - DEPTS.FILE (dspf)
      - EMPLOYEES.PGM (sqlrpgle)
      - MYPGM.PGM (rpgle)
      - NEWEMP.PGM (sqlrpgle)

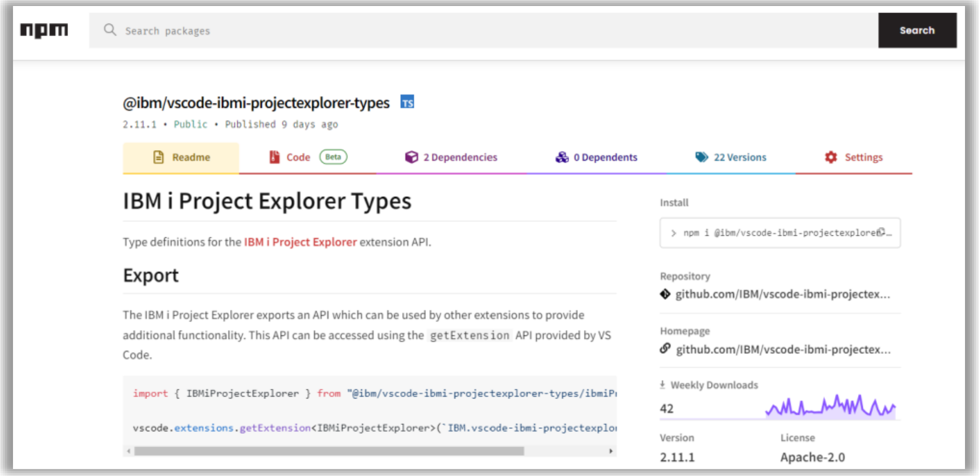
ARCAD-Elias


File
Edit
Selection
View
Go
Run
Terminal
Help
ibmi-company_system
EXPLORER
IBMI-COMPANY_SYSTEM
iproj.json M
iproj.json > ...
Refresh
Execute ARCAD Macro-command
Execute interactive ARCAD Macro-command
Create linked ARCAD application
Display transfers

- PROJECT EXPLORER
  - ibmi-company_system Company System project
    - Source Please configure deploy location
    - Variables 1
    - Library List
    - Object Libraries
    - Include Paths
    - ARCAD Application ABC
    - Source Orbit

```json
{
  "repository": "git@github.com:IBM/ibmi-company_system.git",
  "description": "Company System project",
  "includePath": [
    "qrpgleref"
  ],
  "curlib": "&CURLIB",
  "objlib": "&CURLIB",
  "extensions": {
    "arcad": {
      "code": "ABC"
    }
  }
}
```

What can you integrate with IBM i Project Explorer's API?


npm
Search packages
Search
Readme
Code Beta
2 Dependencies
0 Dependents
22 Versions
Settings

@ibm/vscode-ibmi-projectexplorer-types
2.11.1 • Public • Published 9 days ago

IBM i Project Explorer Types

Type definitions for the IBM i Project Explorer extension API.

Export

The IBM i Project Explorer exports an API which can be used by other extensions to provide additional functionality. This API can be accessed using the `getExtension` API provided by VS Code.

```
import { IBMiProjectExplorer } from "@ibm/vscode-ibmi-projectexplorer-types/ibmiPr

vscode.extensions.getExtension<IBMiProjectExplorer>(`IBM.vscode-ibmi-projectexplor
```

Install
`> npm i @ibm/vscode-ibmi-projectexplore...`

Repository
github.com/IBM/vscode-ibmi-projectex...

Homepage
github.com/IBM/vscode-ibmi-projectex...

Weekly Downloads
42

Version
2.11.1

License
Apache-2.0

Any Questions?

Important Links

IBM i Project Explorer

VS Code Marketplace	https://marketplace.visualstudio.com/items?itemName=IBM.vscode-ibmi-projectexplorer
Documentation	https://ibm.github.io/vscode-ibmi-projectexplorer/#/
GitHub Repository	https://github.com/IBM/vscode-ibmi-projectexplorer
API	https://www.npmjs.com/package/@ibm/vscode-ibmi-projectexplorer-types

Bob

Documentation	https://ibm.github.io/ibmi-bob/#/
GitHub Repository	https://github.com/IBM/ibmi-bob

Code for IBM i

VS Code Marketplace	https://marketplace.visualstudio.com/items?itemName=HalcyonTechLtd.code-for-ibmi
Documentation	https://codefori.github.io/docs/#/
GitHub Repository	https://github.com/codefori/vscode-ibmi
API	https://www.npmjs.com/package/@halcyontech/vscode-ibmi-types

IBM i