WEEK 11 LAB
MIZUROUTE

ERT 474/574

Open-Source Hydro Data Analytics

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University at Buffalo The State University of New York

How do we run mizuRoute?

1

Download source code

- GitHub

2

Compile source code

- Slightly more work

3

Download example dataset

- Here we download the data from google drive

4

Prepare configuration file

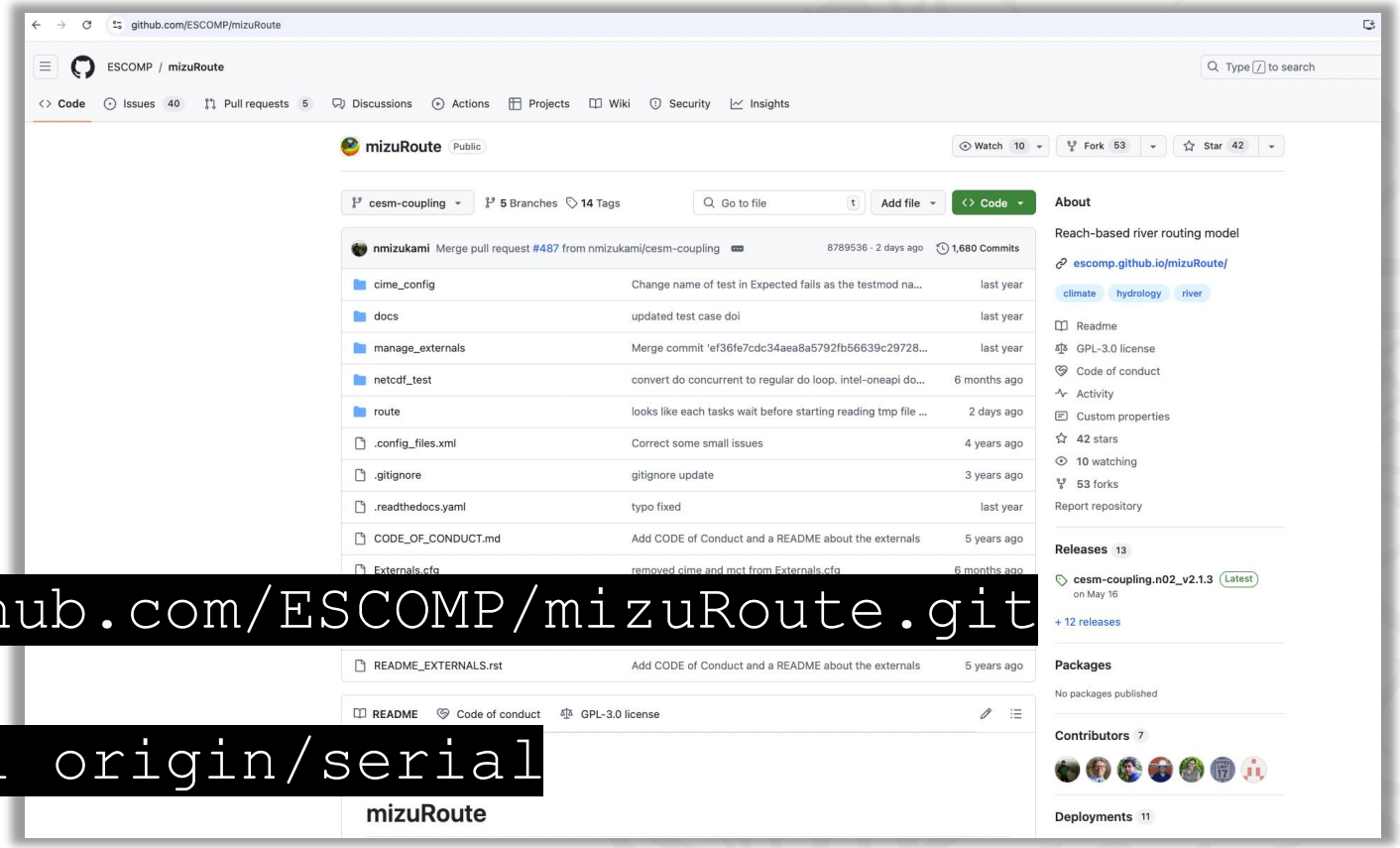
- Relative path or absolute path?

5

Run the model!

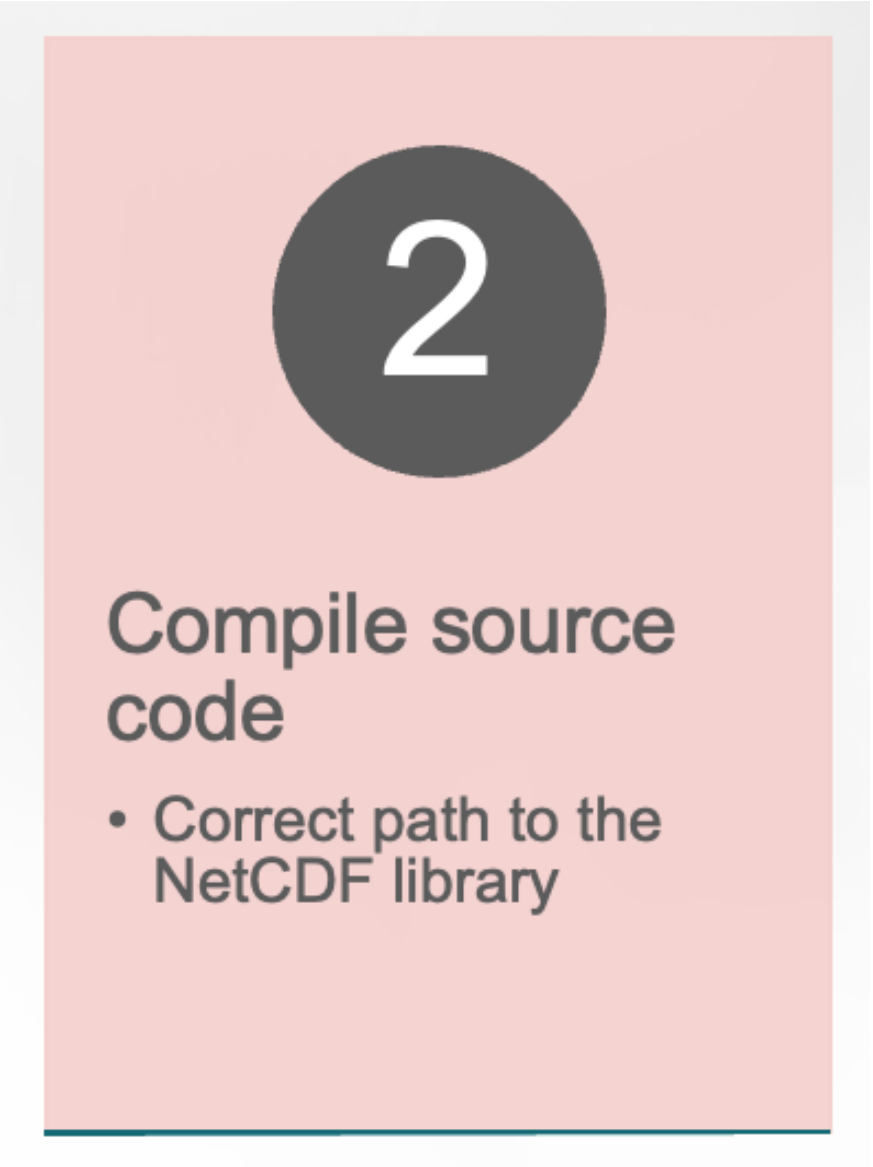
Step 1: Download the source code

1.1. Go to model directory, type following command to download the mizuRoute model source code in “model” folder, and checkout the “serial” branch




```
$ cd /workspaces
$ git clone https://github.com/ESCOMP/mizuRoute.git
$ cd mizuRoute
$ git checkout -b serial origin/serial
```

Step 2: Compile source code



Step 2: Compile source code

- 2.1. Edit the ***Makefile***
  - The Makefile is located in this folder (*/workspaces/mizuRoute/route/build*)
  - Edit the *Makefile* as shown in the right side (5 lines in total)
  - Once you are done, navigate to this folder

```
cd /workspaces/mizuRoute/route/build
```

```
9   #=============================================================================
10  # User configure part
11  #=============================================================================
12  # Define fortran compiler - gnu, intel or pgi
13  FC  =gnu
14
15  # Define the compile exe, e.g., gnu=>gfortran, intel=>ifort, pgi=>pgf90
16  FC_EXE =gfortran
17
18  # Define the executable
19  EXE =route.exe
20
21  # Define optional setting
22  # fast:      Enables optimizations
23  # debug:     Minimum debug options, still
24  # profile:   Enables profiling
25  MODE = debug
26
27  # define open MP option (put yes to activate OMP)
28  isOpenMP =
29
30  # Define core directory below which everything resides
31  # parent directory of the 'build' directory
32  # do not put space at the end of path
33  F_MASTER =/workspaces/mizuRoute/route/
34
35  # Define the NetCDF libraries and path to include files
36  ifeq "$(FC)" "gnu"
37  | NCDF_PATH =/usr
38  else ifeq "$(FC)" "intel"
39  | NCDF_PATH =
40  else ifeq "$(FC)" "pgi"
41  | NCDF_PATH =
42  else
```

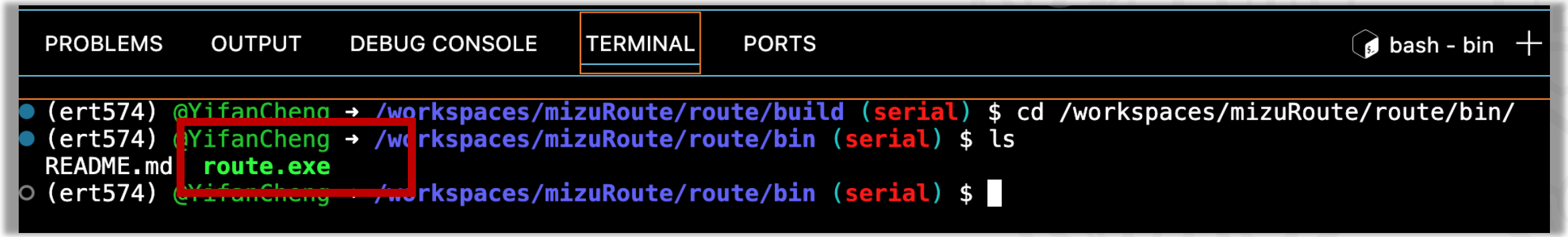
Step 2: Compile source code

- 2.2. Compile the code, and check whether the executable file (route.exe) is successfully generated!

```
make > compile.log
```

```
cd /workspaces/mizuRoute/route/bin
```

```
ls
```



Download example dataset

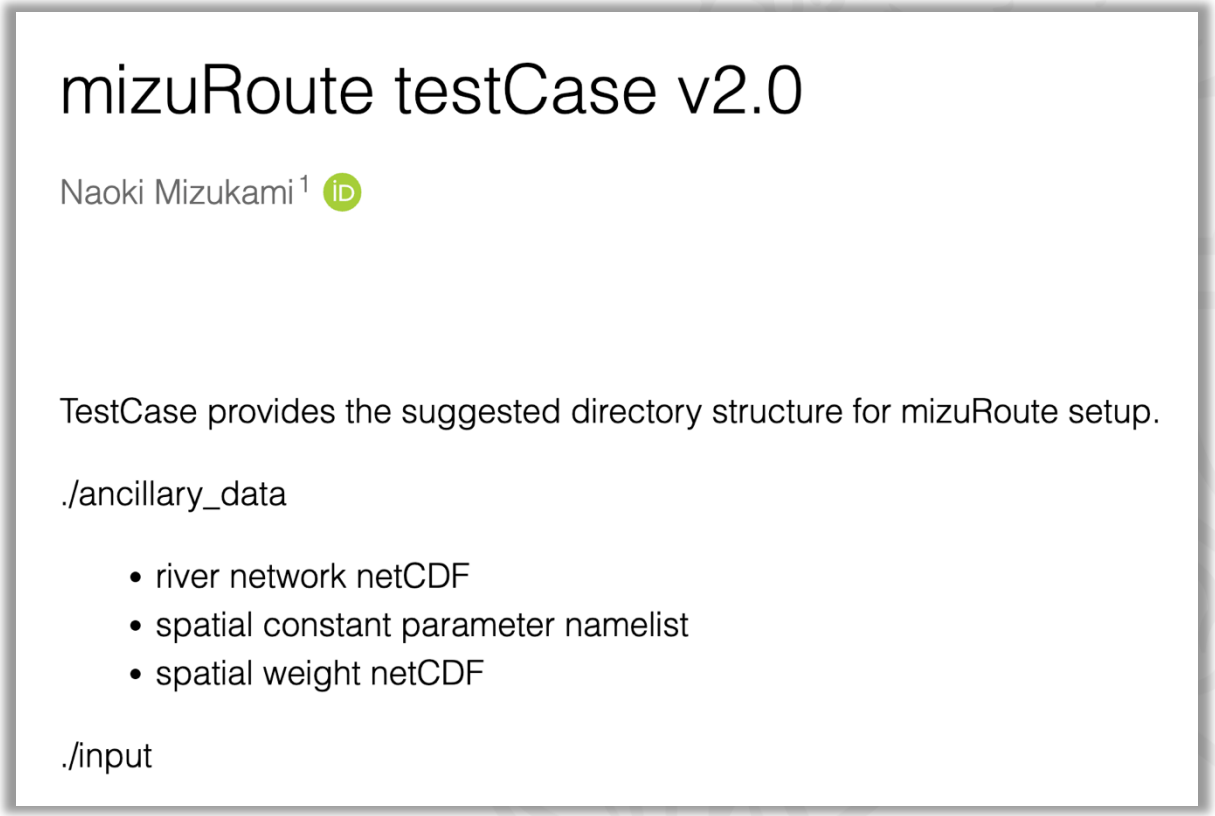
Step 3: Download example data

- 3.1. Prepare the folder for the data
  - The example dataset will be located in */workspaces/test/test_data*

```
cd /workspaces
mkdir test test/test_data
```

Step 3: Download example data

- 3.2. Download the example dataset from https://zenodo.org/records/10108930



mizuRoute testCase v2.0

Naoki Mizukami [1]

TestCase provides the suggested directory structure for mizuRoute setup.

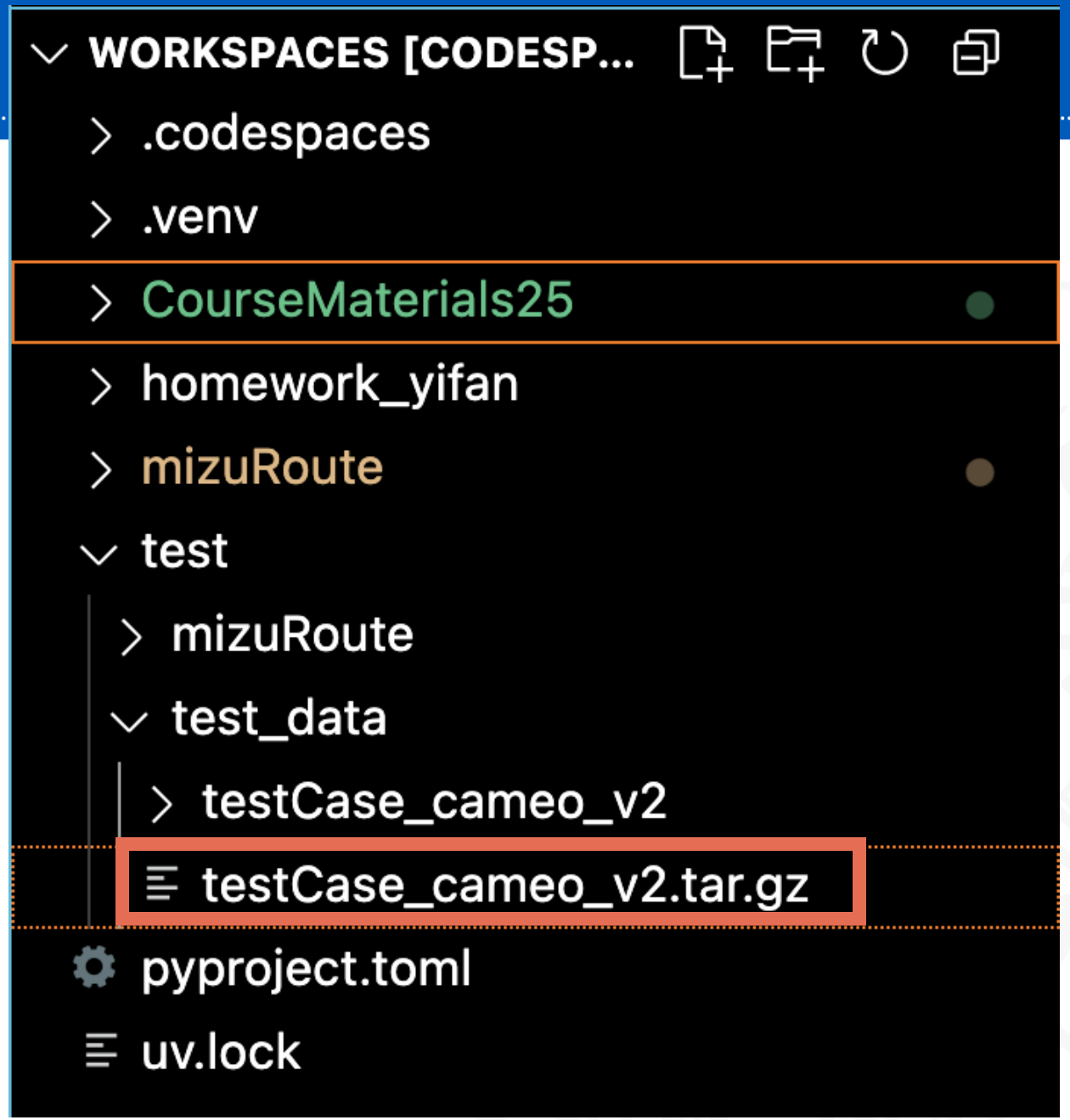
./ancillary_data

- river network netCDF
- spatial constant parameter namelist
- spatial weight netCDF

./input

Step 3: Download example data

- 3.3. Drag ”testcase_cameo_v2.tar.gz” to /workspaces/test/test_data/



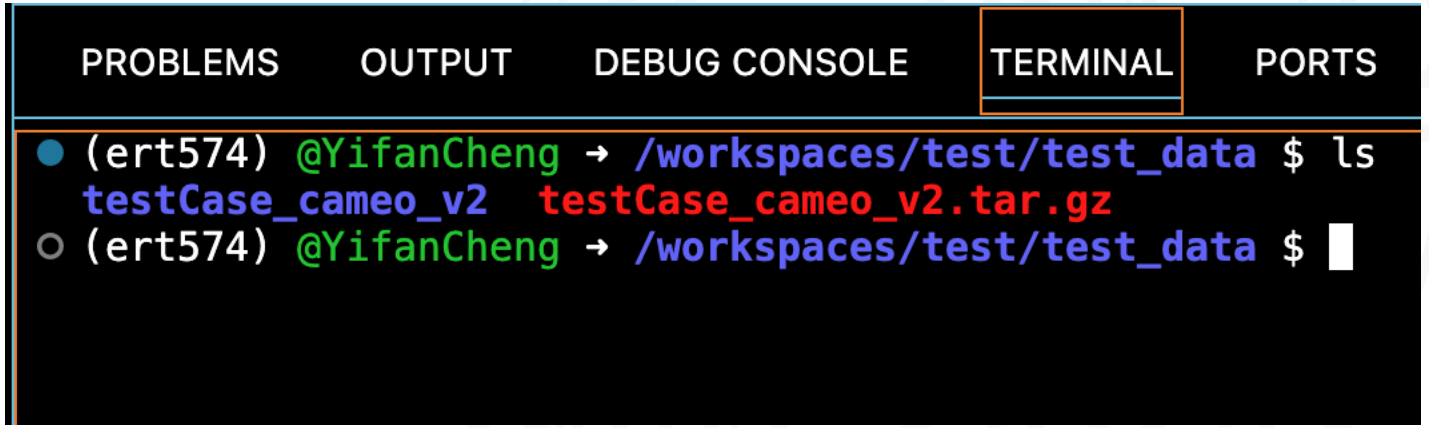
Step 3: Download example data

- 3.4. Unzip the file

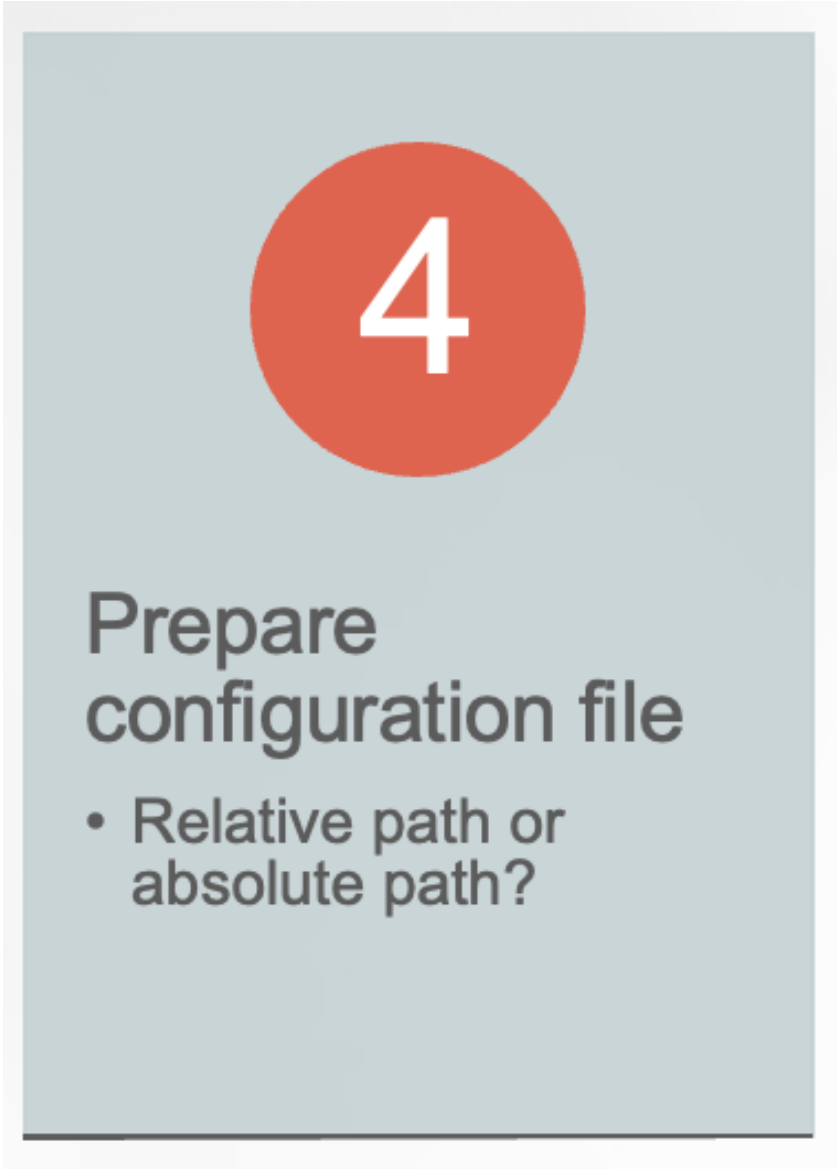
```
cd /workspaces/test/test_data

tar -zxvf testcase_cameo_v2.tar.gz

ls
```



Step 4: Prepare configuration file



Step 4: Prepare configuration file

4.1. Let's first take a look at the configuration file!

The configuration we will use is located in the following folder:

/workspaces/test/test_data/testCase_cameo_v2/settings/serial_version

And we will use *testCase_cameo_case2.control*

Action: Please find this configuration file in the left column and double-click to open this configuration file.

Step 4: Prepare configuration file

4.2. In class, we talked about the four input data into the model!

How can we define them in this configuration file?

1. Runoff data
2. River network and topology file
3. Mapping file
4. Parameter file

The configuration defines 1) the path to the file and 2) filenames separately!

Step 4: Prepare configuration file

1. The path to the file

4.2. In class, we talked about the four input data into the model!

How can we define them in this configuration file?

1. Runoff data
2. River network and topology file
3. Mapping file
4. Parameter file

```
 8    ! ***************************************************************
 9    ! DEFINE DIRECTORIES
10    ! ------------------------
11    <ancil_dir>              ./ancillary_data/
12    <input_dir>              ./input/
13    <output_dir>             ./output/
```

Only runoff data will need to be placed in the *input_dir*.
All other three files will need to be placed in the *ancil_dir*.

Step 4: Prepare configuration file

1. The path to the file

4.2. In class, we talked about the four input data into the model!

4.2.1. Update the directories.

Action: delete the old directory and replace it using the directory in the gray box below

```
 8    ! ************************************************************
 9    ! DEFINE DIRECTORIES
10    ! ------------------------------
11    <ancil_dir>      /workspaces/test/test_data/testCase_cameo_v2/ancillary_data/
12    <input_dir>      /workspaces/test/test_data/testCase_cameo_v2/input/
13    <output_dir>     /workspaces/test/test_data/testCase_cameo_v2/output/
```

Step 4: Prepare configuration file

Filenames

4.2. In class, we talked about the four input data into the model!

How can we define them in this configuration file?

1. Runoff data

```
! ****************************************
! DEFINE RUNOFF FILE
! ------------------------------
<fname_qsim>            RUNOFF_case2.nc
<vname_qsim>            RUNOFF
<vname_time>            time
<vname_hruid>           hru_id
<dname_time>            time
<dname_hruid>           hru_id
<units_qsim>            mm/s
<dt_ro>                 86400
```

2. River network and topology file

```
! ****************************************************
! DEFINE RIVER NETWORK FILE
! ------------------------------------
<fname_ntopOld>         ntopo_nhdplus_cameo_pfaf.nc
<dname_seg>             seg
<dname_nhru>            hru
```

3. Mapping file

```
! ****************************************************************
! DEFINE RUNOFF MAPPING FILE
! ------------------------------
<is_remap>              T
<fname_remap>           spatialweights_grid12km_nhdplus-cameo.nc
<vname_hruid_in_remap>  polyid
<vname_weight>          weight
<vname_qhruid>          overlapPolyId
<vname_num_qhru>        overlaps
<dname_hru_remap>       polyid
<dname_data_remap>      data
```

4. Parameter file

```
! ****************************************
! Namelist file name
!
<param_nml>             param.nml.default
```

Step 4: Prepare configuration file

Filenames

4.2. In class, we talked about the four input data into the model!

Action: Let's check whether those four files exists in their corresponding folders!

1. Runoff data

```
! ****************************************
! DEFINE RUNOFF FILE
! ------------------------------
<fname_qsim>            RUNOFF_case2.nc
<vname_qsim>            RUNOFF
<vname_time>            time
<vname_hruid>           hru_id
<dname_time>            time
<dname_hruid>           hru_id
<units_qsim>            mm/s
<dt_ro>                 86400
```

2. River network and topology file

```
! ****************************************************
! DEFINE RIVER NETWORK FILE
! ------------------------------------
<fname_ntopOld>         ntopo_nhdplus_cameo_pfaf.nc
<dname_seg>             seg
<dname_nhru>            hru
```

3. Mapping file

```
! ****************************************************************
! DEFINE RUNOFF MAPPING FILE
! ------------------------------
<is_remap>              T
<fname_remap>           spatialweights_grid12km_nhdplus-cameo.nc
<vname_hruid_in_remap>  polyid
<vname_weight>          weight
<vname_qhruid>          overlapPolyId
<vname_num_qhru>        overlaps
<dname_hru_remap>       polyid
<dname_data_remap>      data
```

4. Parameter file

```
! ****************************************
! Namelist file name
!
<param_nml>             param.nml.default
```

IT'S TIME TO RUN!!!

Step 5: Run the model

First, let's navigate to the folder with configuration file

```
cd /mizuRoute/route/workspaces/test/test_data/testCase_cameo_v2/settings/serial_version
```

Second, run the model using the following command

```
/workspaces/mizuRoute/route/bin/route.exe testCase_cameo_case2.control
```