[](https://ida.interchain.io/)

[Interchain Developer Academy](https://ida.interchain.io/)/[Interchain Developer Academy](https://ida.interchain.io/ida-course/exercise-week2.html)



Search

[Interchain Developer Academy](https://ida.interchain.io/)[Interchain Developer Academy](https://ida.interchain.io/ida-course/exercise-week2.html)

Search



Filters

Interchain Developer Academy

[](https://ida.interchain.io/ida-course/exercise-week2.html)

[Week 0 - Getting Started](https://ida.interchain.io/ida-course/exercise-week2.html)

[Getting Started](https://ida.interchain.io/ida-course/exercise-week2.html)

[Blockchain 101](https://ida.interchain.io/ida-course/exercise-week2.html)

[Blockchain History](https://ida.interchain.io/ida-course/exercise-week2.html)

[Public and Managed Blockchains](https://ida.interchain.io/ida-course/exercise-week2.html)

[Consensus in Distributed Networks](https://ida.interchain.io/ida-course/exercise-week2.html)

[Cryptography](https://ida.interchain.io/ida-course/exercise-week2.html)

[Self-Assessment Quiz](https://ida.interchain.io/ida-course/exercise-week2.html)

[Go Introduction - First Steps](https://ida.interchain.io/ida-course/exercise-week2.html)

[Go Basics](https://ida.interchain.io/ida-course/exercise-week2.html)

[Go Interfaces](https://ida.interchain.io/ida-course/exercise-week2.html)

[Control Structures in Go](https://ida.interchain.io/ida-course/exercise-week2.html)

[Arrays and Slices in Go](https://ida.interchain.io/ida-course/exercise-week2.html)

[Standard Packages in Go](https://ida.interchain.io/ida-course/exercise-week2.html)

[Concurrency in Go](https://ida.interchain.io/ida-course/exercise-week2.html)

[Good-To-Know Dev Terms](https://ida.interchain.io/ida-course/exercise-week2.html)

[Docker Introduction](https://ida.interchain.io/ida-course/exercise-week2.html)

[](https://ida.interchain.io/ida-course/exercise-week2.html)

[Week 1 - Introduction to the Interchain](https://ida.interchain.io/ida-course/exercise-week2.html)

[Introduction to the Interchain](https://ida.interchain.io/ida-course/exercise-week2.html)

[Blockchain Technology and the Interchain](https://ida.interchain.io/ida-course/exercise-week2.html)

[The Interchain Ecosystem](https://ida.interchain.io/ida-course/exercise-week2.html)

[Getting ATOM and Staking It](https://ida.interchain.io/ida-course/exercise-week2.html)

[A Blockchain App Architecture](https://ida.interchain.io/ida-course/exercise-week2.html)

[Accounts](https://ida.interchain.io/ida-course/exercise-week2.html)

[Transactions](https://ida.interchain.io/ida-course/exercise-week2.html)

[Messages](https://ida.interchain.io/ida-course/exercise-week2.html)

[Modules](https://ida.interchain.io/ida-course/exercise-week2.html)

[Protobuf](https://ida.interchain.io/ida-course/exercise-week2.html)

[Multistore and Keepers](https://ida.interchain.io/ida-course/exercise-week2.html)

[BaseApp](https://ida.interchain.io/ida-course/exercise-week2.html)

[Queries](https://ida.interchain.io/ida-course/exercise-week2.html)

[Events](https://ida.interchain.io/ida-course/exercise-week2.html)

[Context](https://ida.interchain.io/ida-course/exercise-week2.html)

[Testing](https://ida.interchain.io/ida-course/exercise-week2.html)

[Relaying with IBC](https://ida.interchain.io/ida-course/exercise-week2.html)

[Interchain Security](https://ida.interchain.io/ida-course/exercise-week2.html)

[Bridges](https://ida.interchain.io/ida-course/exercise-week2.html)

[Migrations](https://ida.interchain.io/ida-course/exercise-week2.html)

[Week 1 Quiz](https://ida.interchain.io/ida-course/exercise-week2.html)

[](https://ida.interchain.io/ida-course/exercise-week2.html)

[Week 2 - First Steps](https://ida.interchain.io/ida-course/exercise-week2.html)

[First Steps](https://ida.interchain.io/ida-course/exercise-week2.html)

[Setup Your Work Environment](https://ida.interchain.io/ida-course/exercise-week2.html)

[Run a Node, API, and CLI](https://ida.interchain.io/ida-course/exercise-week2.html)

[Ignite CLI](https://ida.interchain.io/ida-course/exercise-week2.html)

[Exercise - Make a Checkers Blockchain](https://ida.interchain.io/ida-course/exercise-week2.html)

[Store Object](https://ida.interchain.io/ida-course/exercise-week2.html)

[Create Custom Messages](https://ida.interchain.io/ida-course/exercise-week2.html)

[Create and Save a Game Properly](https://ida.interchain.io/ida-course/exercise-week2.html)

[Add a Way to Make a Move](https://ida.interchain.io/ida-course/exercise-week2.html)

[Emit Game Information](https://ida.interchain.io/ida-course/exercise-week2.html)

[Record the Game Winner](https://ida.interchain.io/ida-course/exercise-week2.html)

[Week 2 Exercise](https://ida.interchain.io/ida-course/exercise-week2.html)

[](https://ida.interchain.io/ida-course/exercise-week2.html)

[Week 3 - Introduction to IBC and CosmJS](https://ida.interchain.io/ida-course/exercise-week2.html)

[Introduction to IBC and CosmJS](https://ida.interchain.io/ida-course/exercise-week2.html)

[What is IBC?](https://ida.interchain.io/ida-course/exercise-week2.html)

[IBC/TAO - Connections (OPTIONAL)](https://ida.interchain.io/ida-course/exercise-week2.html)

[IBC/TAO - Channels (OPTIONAL)](https://ida.interchain.io/ida-course/exercise-week2.html)

[IBC/TAO - Clients (OPTIONAL)](https://ida.interchain.io/ida-course/exercise-week2.html)

[IBC Token Transfer](https://ida.interchain.io/ida-course/exercise-week2.html)

[Interchain Accounts (OPTIONAL)](https://ida.interchain.io/ida-course/exercise-week2.html)

[IBC Middleware (OPTIONAL)](https://ida.interchain.io/ida-course/exercise-week2.html)

[Create a Custom IBC Middleware (OPTIONAL)](https://ida.interchain.io/ida-course/exercise-week2.html)

[Integrate IBC Middleware Into a Chain (OPTIONAL)](https://ida.interchain.io/ida-course/exercise-week2.html)

[IBC Tooling](https://ida.interchain.io/ida-course/exercise-week2.html)

[What is CosmJS?](https://ida.interchain.io/ida-course/exercise-week2.html)

[Your First CosmJS Actions](https://ida.interchain.io/ida-course/exercise-week2.html)

[Compose Complex Transactions](https://ida.interchain.io/ida-course/exercise-week2.html)

[Learn to Integrate Keplr](https://ida.interchain.io/ida-course/exercise-week2.html)

[Create Custom CosmJS Interfaces](https://ida.interchain.io/ida-course/exercise-week2.html)

[](https://ida.interchain.io/ida-course/exercise-week2.html)

[Week 4 - Ignite CLI and IBC Advanced](https://ida.interchain.io/ida-course/exercise-week2.html)

[Ignite CLI and IBC Advanced](https://ida.interchain.io/ida-course/exercise-week2.html)

[Keep an Up-To-Date Game Deadline](https://ida.interchain.io/ida-course/exercise-week2.html)

[Keep Track Of How Many Moves Have Been Played](https://ida.interchain.io/ida-course/exercise-week2.html)

[Put Your Games in Order](https://ida.interchain.io/ida-course/exercise-week2.html)

[Auto-Expiring Games](https://ida.interchain.io/ida-course/exercise-week2.html)

[Let Players Set a Wager](https://ida.interchain.io/ida-course/exercise-week2.html)

[Handle wager payments](https://ida.interchain.io/ida-course/exercise-week2.html)

[Integration tests](https://ida.interchain.io/ida-course/exercise-week2.html)

[Incentivize Players](https://ida.interchain.io/ida-course/exercise-week2.html)

[Help Find a Correct Move](https://ida.interchain.io/ida-course/exercise-week2.html)

[Play With Cross-Chain Tokens](https://ida.interchain.io/ida-course/exercise-week2.html)

[Understand IBC Denoms](https://ida.interchain.io/ida-course/exercise-week2.html)

[Go Relayer](https://ida.interchain.io/ida-course/exercise-week2.html)

[Hermes Relayer](https://ida.interchain.io/ida-course/exercise-week2.html)

[](https://ida.interchain.io/ida-course/exercise-week2.html)

[Week 5 - CosmJS Advanced](https://ida.interchain.io/ida-course/exercise-week2.html)

[CosmJS Advanced](https://ida.interchain.io/ida-course/exercise-week2.html)

[Create Custom Objects](https://ida.interchain.io/ida-course/exercise-week2.html)

[Create Custom Messages](https://ida.interchain.io/ida-course/exercise-week2.html)

[Get an External GUI](https://ida.interchain.io/ida-course/exercise-week2.html)

[Integrate CosmJS and Keplr](https://ida.interchain.io/ida-course/exercise-week2.html)

[Backend Script for Game Indexing](https://ida.interchain.io/ida-course/exercise-week2.html)

[](https://ida.interchain.io/ida-course/exercise-week2.html)

[Week 6 - IBC Deep Dive](https://ida.interchain.io/ida-course/exercise-week2.html)

[IBC Deep Dive](https://ida.interchain.io/ida-course/exercise-week2.html)

[IBC Application Developer Introduction](https://ida.interchain.io/ida-course/exercise-week2.html)

[Make a Module IBC-Enabled](https://ida.interchain.io/ida-course/exercise-week2.html)

[Adding Packet and Acknowledgment Data](https://ida.interchain.io/ida-course/exercise-week2.html)

[Extend the Checkers Game With a Leaderboard](https://ida.interchain.io/ida-course/exercise-week2.html)

[Create a Leaderboard Chain](https://ida.interchain.io/ida-course/exercise-week2.html)

[](https://ida.interchain.io/ida-course/exercise-week2.html)

[Week 7 - From Code to MVP to Production and Migrations](https://ida.interchain.io/ida-course/exercise-week2.html)

[From Code to MVP to Production and Migrations](https://ida.interchain.io/ida-course/exercise-week2.html)

[Run in Production](https://ida.interchain.io/ida-course/exercise-week2.html)

[Prepare the Software to Run](https://ida.interchain.io/ida-course/exercise-week2.html)

[Prepare a Validator and Keys](https://ida.interchain.io/ida-course/exercise-week2.html)

[Prepare Where the Node Starts](https://ida.interchain.io/ida-course/exercise-week2.html)

[Prepare and Connect to Other Nodes](https://ida.interchain.io/ida-course/exercise-week2.html)

[Configure, Run, and Set Up a Service](https://ida.interchain.io/ida-course/exercise-week2.html)

[Prepare and Do Migrations](https://ida.interchain.io/ida-course/exercise-week2.html)

[Simulate Production in Docker](https://ida.interchain.io/ida-course/exercise-week2.html)

[Tally Player Info After Production](https://ida.interchain.io/ida-course/exercise-week2.html)

[Add a Leaderboard as a Module](https://ida.interchain.io/ida-course/exercise-week2.html)

[Migrate the Leaderboard Module After Production](https://ida.interchain.io/ida-course/exercise-week2.html)

[Simulate a Migration in Docker](https://ida.interchain.io/ida-course/exercise-week2.html)

[Final Exam](https://ida.interchain.io/ida-course/exercise-week2.html)

[](https://ida.interchain.io/ida-course/exercise-week2.html)

[What's Next?](https://ida.interchain.io/ida-course/exercise-week2.html)

[Continue Your Interchain Journey](https://ida.interchain.io/ida-course/exercise-week2.html)

Docs Version Switcher

On this page

[Preparation](https://ida.interchain.io/ida-course/exercise-week2.html#preparation)

[What we set up](https://ida.interchain.io/ida-course/exercise-week2.html#what-we-set-up)

[What you need to do](https://ida.interchain.io/ida-course/exercise-week2.html#what-you-need-to-do)

[Definition of success](https://ida.interchain.io/ida-course/exercise-week2.html#definition-of-success)

[Read-only files](https://ida.interchain.io/ida-course/exercise-week2.html#read-only-files)

[CI Environment](https://ida.interchain.io/ida-course/exercise-week2.html#ci-environment)

[When you are ready](https://ida.interchain.io/ida-course/exercise-week2.html#when-you-are-ready)

[#Copy link](https://ida.interchain.io/ida-course/exercise-week2.html#week-2-exercise) **Week 2 Exercise**

You are about to perform a small, simple exercise on our Academy Gitlab, to check you're paying attention! Before you [try (opens new window)↗](https://git.academy.b9lab.com/ida-p4-exercise-week-2/exercise-code), here is a summary of what you will be asked to do.



The final exam will have the same format, so this is a good way to acquaint yourself with the modus operandi.

[#Copy link](https://ida.interchain.io/ida-course/exercise-week2.html#preparation) Preparation

We created a Docker container with the included Dockerfile:



Copy

$ docker build . -t exercise-w2

Create this Docker image right now, before you start working on the exercise. It takes time and it makes a copy of the original files.

[#Copy link](https://ida.interchain.io/ida-course/exercise-week2.html#what-we-set-up) What we set up

We created the rest of this repository with Ignite CLI v0.22.1 and the following command:



Copy

$ docker run --rm -it \

-v $(pwd):/exercise -w /exercise \

exercise-w2 \

ignite scaffold chain github.com/b9lab/other-world

The idea is that this is the blockchain backing a future metaverse. The blockchain will account for anything of value in it.

We have added:

* One file that duplicates what accessing the storage looks like: x/otherworld/keeper/world\_params\_duplicate.go.
* And 2 test files:
  + x/otherworld/types/world\_params\_student\_test.go
  + x/otherworld/keeper/world\_params\_student\_test.go

All 3 files cannot compile until you have completed the following tasks.

[#Copy link](https://ida.interchain.io/ida-course/exercise-week2.html#what-you-need-to-do) What you need to do

You need to run an Ignite command to create a new Protobuf type and its associated keeper functions. It must satisfy the following conditions:

1. The name is WorldParams.
2. It has 3 params exactly, no more, no less:
   1. A string for the world's name.
   2. A uint for the world's gravity.
   3. A uint for the world's landSupply.
3. It is unique in the blockchain store. It does not matter what key it is stored at, but you should keep the naming conventions of keeper functions chosen by Ignite.
4. It should not have any associated messages.

[#Copy link](https://ida.interchain.io/ida-course/exercise-week2.html#definition-of-success) Definition of success

The following tests must pass:

* x/otherworld/types/world\_params\_student\_test.go: It needs to pass with:



Copy

$ docker run --rm -it \

-v $(pwd):/exercise -w /exercise \

exercise-w2 \

go test github.com/b9lab/other-world/x/otherworld/types

Or:



Copy

$ go test github.com/b9lab/other-world/x/otherworld/types

* x/otherworld/keeper/world\_params\_student\_test.go: It needs to pass with:



Copy

$ docker run --rm -it \

-v $(pwd):/exercise -w /exercise \

exercise-w2 \

go test github.com/b9lab/other-world/x/otherworld/keeper

Or:



Copy

$ go test github.com/b9lab/other-world/x/otherworld/keeper

To run them both at the same time, run:



Copy

$ docker run --rm -it \

-v $(pwd):/exercise -w /exercise \

exercise-w2 /exercise/score.sh

Or:



Copy

$ ./score.sh

This returns a score that reads like:



Copy

FS\_SCORE:100%

[#Copy link](https://ida.interchain.io/ida-course/exercise-week2.html#read-only-files) Read-only files

In fileconfig.yml we have defined a list of *read-only* files. They are not technically read-only, but we will overwrite your changes if you modify them.

[#Copy link](https://ida.interchain.io/ida-course/exercise-week2.html#ci-environment) CI Environment

There is a CI environment on the Academy Gitlab server. Every time you push to your repository, it will run and score your work.

The script that our CI runs is score-ci.sh. You will notice that it overwrites the *read-only* files with their original ones. So if the CI gives you a score different from the one you have on your machine, you may have made changes to read-only files.

The score that appears on Gitlab's CI is the *correct* one.

[#Copy link](https://ida.interchain.io/ida-course/exercise-week2.html#when-you-are-ready) When you are ready

Please push your exercise solution to the [Week 2 Exercise repo (opens new window)↗](https://git.academy.b9lab.com/ida-p4-exercise-week-2/exercise-code).



**We recommend you attempt the exercise as soon as you finish the week's material, or by Thursday, June 1st, 11:59pm UTC.**   
  
Do not worry if you do not pass the exercise: it is simply meant to be an opportunity to practice and demonstrate your engagement with the program.

previous

[](https://ida.interchain.io/hands-on-exercise/1-ignite-cli/8-game-winner.html)

**[Record the Game Winner](https://ida.interchain.io/hands-on-exercise/1-ignite-cli/8-game-winner.html)**

up next

**[Introduction to IBC and CosmJS](https://ida.interchain.io/ida-course/LPs/week-3/)**

[[](https://ida.interchain.io/ida-course/LPs/week-3/)](https://ida.interchain.io/ida-course/LPs/week-3/)

Rate this Page

icon smile

icon meh

icon frown

Would you like to add a message?

Submit

Thank you for your Feedback!

[](https://ida.interchain.io/ida-course/discord-info.html)

On this page

[Preparation](https://ida.interchain.io/ida-course/exercise-week2.html#preparation)

[What we set up](https://ida.interchain.io/ida-course/exercise-week2.html#what-we-set-up)

[What you need to do](https://ida.interchain.io/ida-course/exercise-week2.html#what-you-need-to-do)

[Definition of success](https://ida.interchain.io/ida-course/exercise-week2.html#definition-of-success)

[Read-only files](https://ida.interchain.io/ida-course/exercise-week2.html#read-only-files)

[CI Environment](https://ida.interchain.io/ida-course/exercise-week2.html#ci-environment)

[When you are ready](https://ida.interchain.io/ida-course/exercise-week2.html#when-you-are-ready)

#### **Get Cosmos updates**

Unsubscribe at any time. [Privacy Policy↗](https://v1.cosmos.network/privacy)

     Next

Documentation

[Cosmos SDK](https://docs.cosmos.network/)[Cosmos Hub](https://hub.cosmos.network/)[CometBFT](https://docs.cometbft.com/)[IBC Protocol](https://ibc.cosmos.network/)

Community

[Interchain blog](https://blog.cosmos.network/)[Forum](https://forum.cosmos.network/)[Discord](https://discord.gg/cosmosnetwork)

Contributing

[Source code on GitHub](https://github.com/cosmos/sdk-tutorials)

[](https://ida.interchain.io/)

[Interchain Developer Academy](https://ida.interchain.io/)

**[](https://blog.cosmos.network/)[](https://twitter.com/cosmos)[](https://discord.gg/cosmosnetwork)[](https://www.linkedin.com/company/interchain-foundation/about/)[](https://reddit.com/r/cosmosnetwork)[](https://t.me/cosmosproject)[](https://www.youtube.com/c/CosmosProject)**



Dark mode

† This website is maintained by the Interchain Foundation (ICF). The contents and opinions of this website are those of the ICF. The ICF provides links to cryptocurrency exchanges as a service to the public. The ICF does not warrant that the information provided by these websites is correct, complete, and up-to-date. The ICF is not responsible for their content and expressly rejects any liability for damages of any kind resulting from the use, reference to, or reliance on any information contained within these websites.

Cosmos is a registered trademark of the [Interchain Foundation.](https://interchain.io/)[Privacy](https://v1.cosmos.network/privacy)