Smart-Contracts

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Batch - A 2
Inlab - 4

Task 1: Answers screenshot

Knowledge check

200 XP

8 minutes

1. Solidity smart contracts are run on: *

- Ethereum blockchain
- The Ethereum Virtual Machine
  - ✓ Correct. Solidity runs contracts on the Ethereum Virtual Machine. This sandboxed environment self-contains all the transaction history for the contracts.
- Any virtual machine
- Any sandbox environment

2. Events describe

- event Pu
- event Pu
  - ✓ Correct.
- emit Pur
- Purchase

3. What is an exar

- Structs
  - ✓ Correct.
- State variables
- Addresses
- Arrays

4. What is typically the first line of a smart contract source file? *

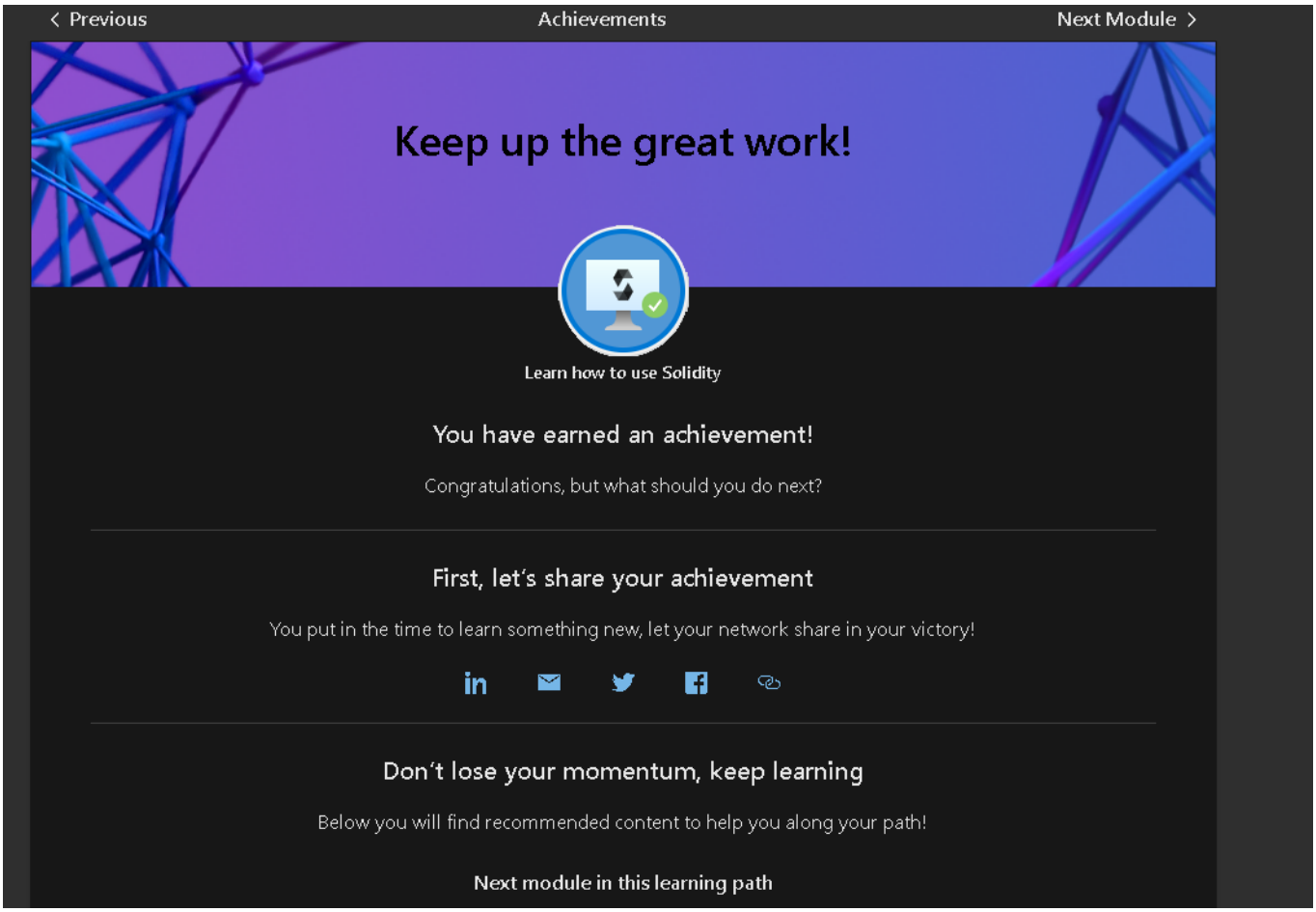
- A contract definition
- A pragma directive
  - ✓ Correct. Pragma is the keyword that you use to ask the compiler to check whether its version of Solidity matches the required version.
- A Solidity version
- An event

Congratulations!

You earned experience points for completing the knowledge check.

Continue

Review answers



Task 2:

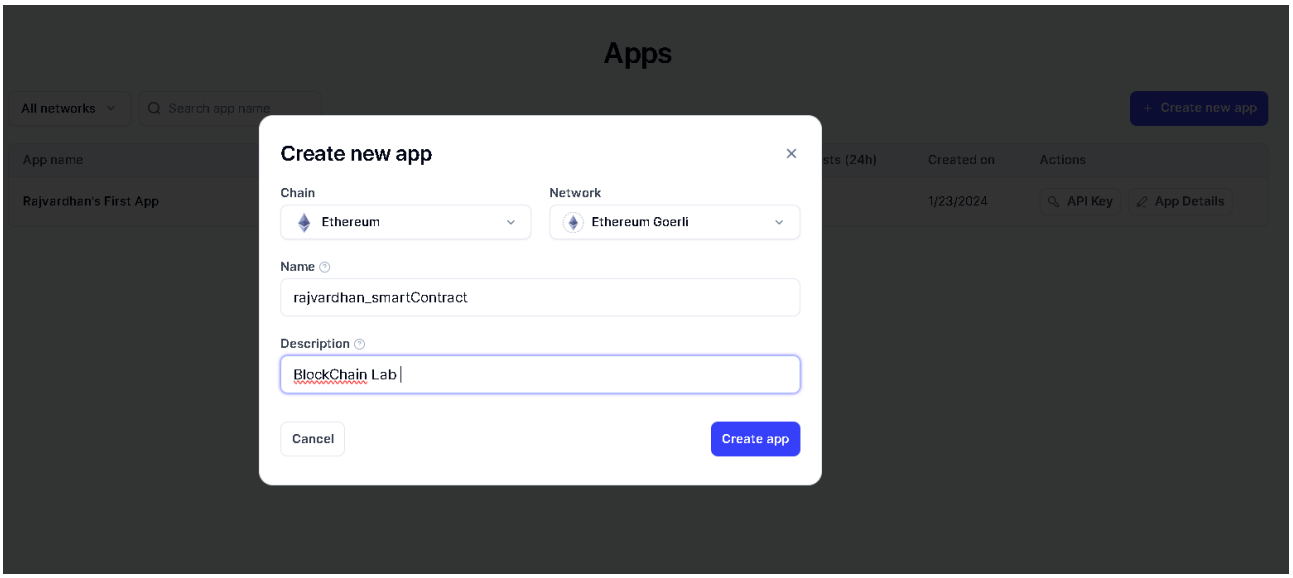
lab.sol

```
pragma solidity >=0.7.3;


contract HelloWorld {

   event UpdatedMessages(string oldStr, string newStr);

   string public message;


   constructor(string memory initMessage) {

      message = initMessage;
   }

   function update(string memory newMessage) public {
```

```
        string memory oldMsg = message;
        message = newMessage;
        emit UpdatedMessages(oldMsg, newMessage);
    }
}
```

Task 3:

1. Create your app



2. Initialize our project

```
PS D:\Dev\blockchain> npm init #
This utility will walk you through creating a package.json file.
It only covers the most common items, and tries to guess sensible defaults.

See `npm help init` for definitive documentation on these fields
and exactly what they do.

Use `npm install <pkg>` afterwards to install a package and
save it as a dependency in the package.json file.

Press ^C at any time to quit.
package name: (blockchain)
version: (1.0.0)
description: smart contract lab
entry point: (index.js)
test command:
git repository:
```

```
keywords:
author: ice
license: (ISC)
About to write to D:\Dev\blockchain\package.json:

{
  "name": "blockchain",
  "version": "1.0.0",
  "description": "smart contract lab",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "author": "ice",
  "license": "ISC"
}


Is this OK? (yes)
```

3. Download Hardhat

```
PS D:\Dev\blockchain> npm install --save-dev hardhat

added 311 packages, and audited 312 packages in 4m

69 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities
```

4. Create Hardhat project

```
PS D:\Dev\blockchain> npx hardhat
888    888                      888 888               888
888    888                      888 888               888
888    888                      888 888               888
8888888888  8888b.  888d888 .d88888 88888b.   8888b.  888888
888    888     "88b 888P"  d88" 888 888 "88b     "88b 888
888    888 .d888888 888    888  888 888  888 .d888888 888
```

```
888    888 888  888 888    Y88b 888 888  888 888  888 Y88b.
888    888 "Y888888 888     "Y88888 888  888 "Y888888  "Y888

Welcome to Hardhat v2.19.4

√ What do you want to do? · Create an empty hardhat.config.js
Config file created

Give Hardhat a star on Github if you're enjoying it!

     https://github.com/NomicFoundation/hardhat


DEPRECATION WARNING

 Initializing a project with npx hardhat is deprecated and will be removed in
the future.
 Please use npx hardhat init instead.
```

5. Add project folders

```
PS D:\Dev\blockchain> mkdir contracts


    Directory: D:\Dev\blockchain


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
d-----        23-01-2024     12:06                contracts


PS D:\Dev\blockchain> mkdir scripts


    Directory: D:\Dev\blockchain


Mode                 LastWriteTime         Length Name
```

```
----                 -------------         ------ ----
d-----        23-01-2024     12:06                scripts
```

6. Install Ethers.js

```
PS D:\Dev\blockchain> npm install --save-dev @nomiclabs/hardhat-ethers
"ethers@^5.0.0"

added 3 packages, changed 1 package, and audited 316 packages in 16s

70 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities
```

7. Compile our contract

```
PS D:\Dev\blockchain> npx hardhat compile
√ Help us improve Hardhat with anonymous crash reports & basic usage data? (Y/n)
· y
Downloading compiler 0.7.3
contracts/lab.sol: Warning: SPDX license identifier not provided in source file.
Before publishing, consider adding a comment containing "SPDX-License-
Identifier: <SPDX-License>" to each source file. Use "SPDX-License-Identifier:
UNLICENSED" for non-open-source code. Please see https://spdx.org for more
information.

Compiled 1 Solidity file successfully (evm target: istanbul).
```

8. Deploy our contract

```
npx hardhat run scripts/deploy.js --network goerli
```

References:

- https://www.web3.university/tracks/create-a-smart-contract/deploy-your-first-smart-contract
- https://learn.microsoft.com/en-us/training/modules/blockchain-learning-solidity/