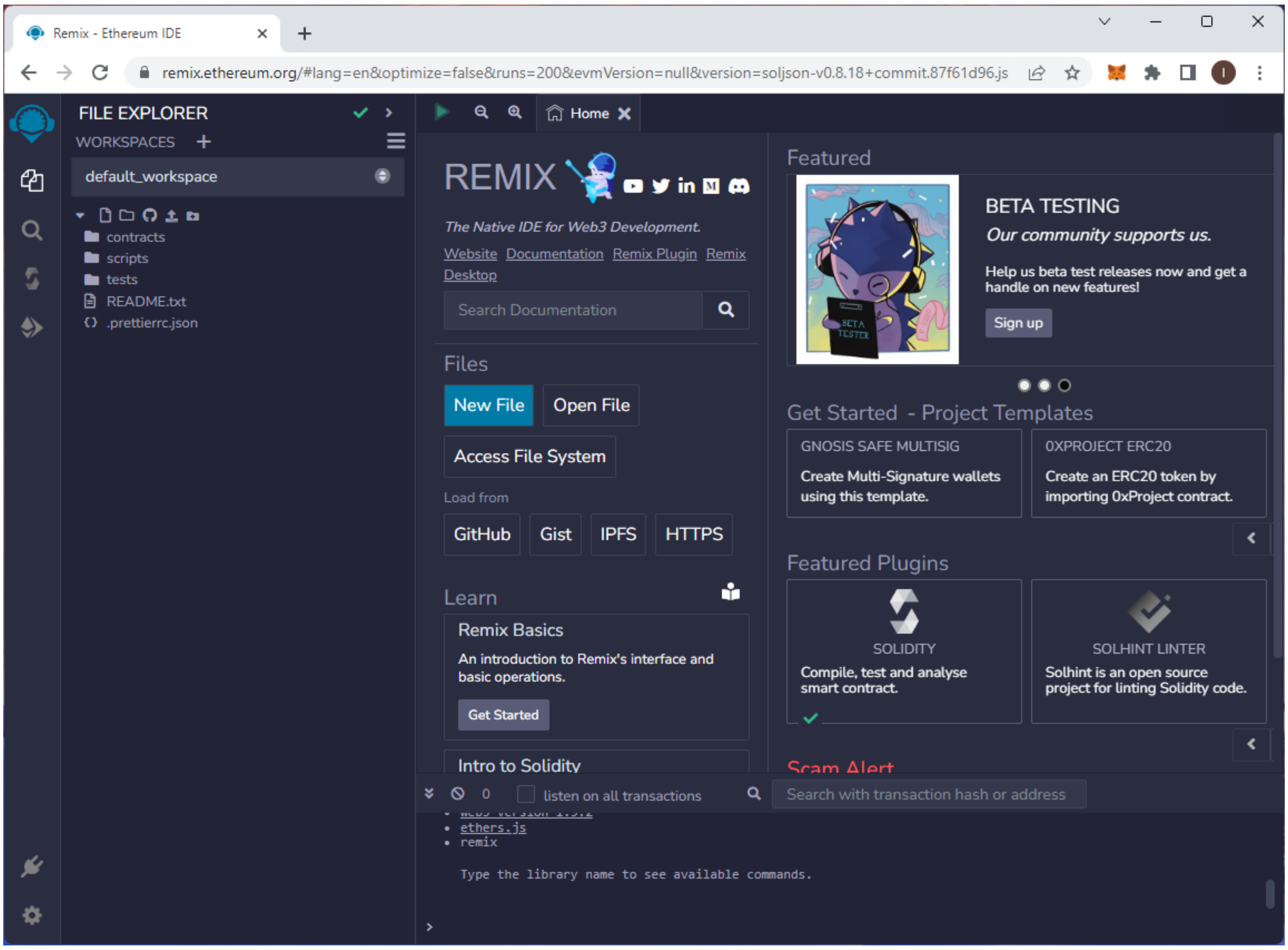
Deploying smart contract on BPX mainnet using Remix IDE

1. Open the Remix IDE.



The Native IDE for Web3 Development.

Our community supports us.

Help us beta test releases now and get a handle on new features!

Create Multi-Signature wallets using this template.

Create an ERC20 token by importing 0xProject contract.

Compile, test and analyse smart contract.

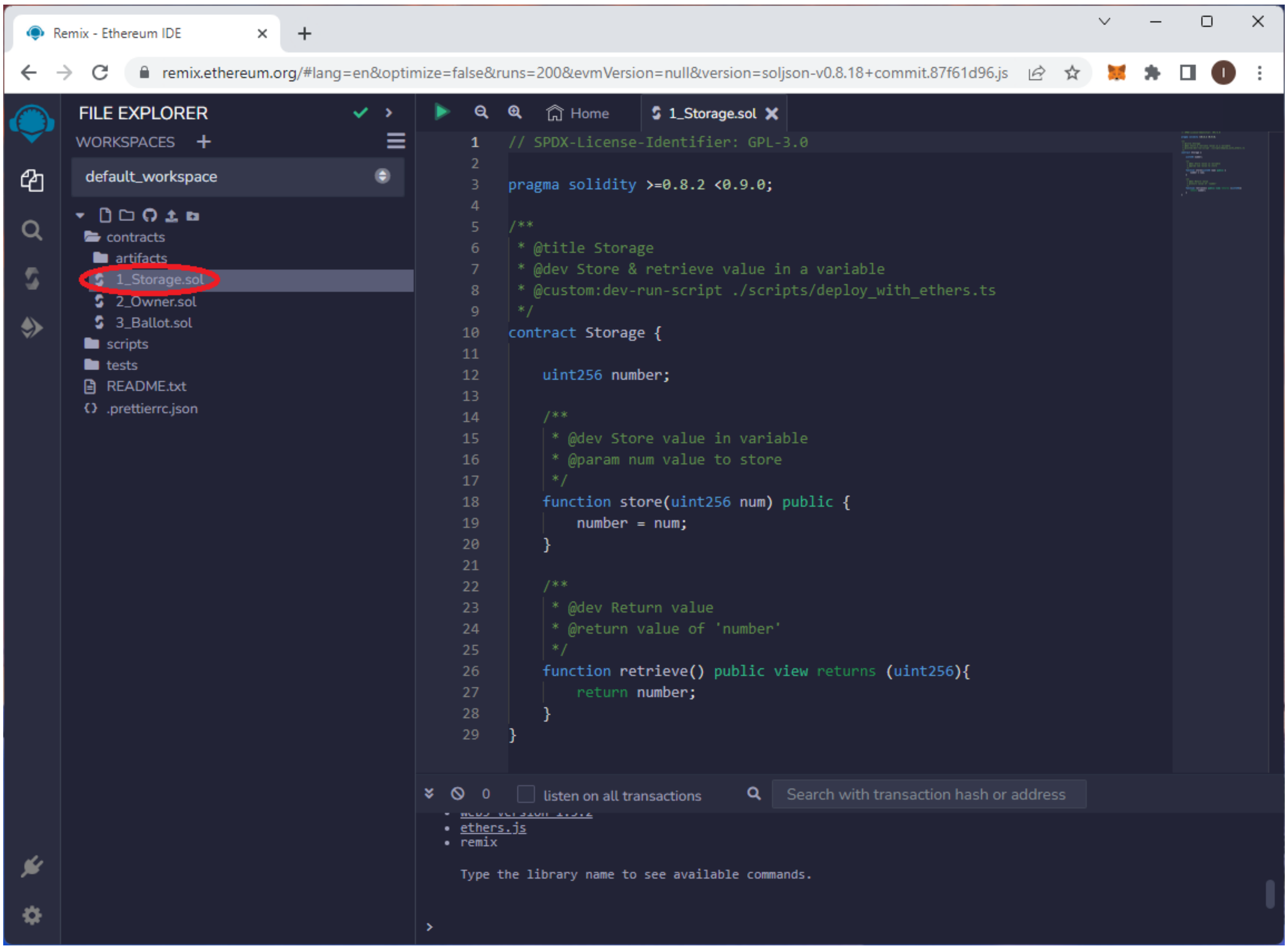
Solhint is an open source project for linting Solidity code.

An introduction to Remix's interface and basic operations.

```
• ethers.js
• remix

  Type the library name to see available commands.
```

2. In our example, we will use one of the test smart contracts that is already uploaded into the IDE. Open `contracts/1_Storage.sol` file.


Remix - Ethereum IDE
remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js
FILE EXPLORER
WORKSPACES
default_workspace
contracts
artifacts
1_Storage.sol
2_Owner.sol
3_Ballot.sol
scripts
tests
README.txt
.prettierrc.json
Home
1_Storage.sol
0
listen on all transactions
Search with transaction hash or address

```
// SPDX-License-Identifier: GPL-3.0

pragma solidity >=0.8.2 <0.9.0;

/**
 * @title Storage
 * @dev Store & retrieve value in a variable
 * @custom:dev-run-script ./scripts/deploy_with_ethers.ts
 */
contract Storage {

    uint256 number;

    /**
     * @dev Store value in variable
     * @param num value to store
     */
    function store(uint256 num) public {
        number = num;
    }

    /**
     * @dev Return value
     * @return value of 'number'
     */
    function retrieve() public view returns (uint256){
        return number;
    }
}
```

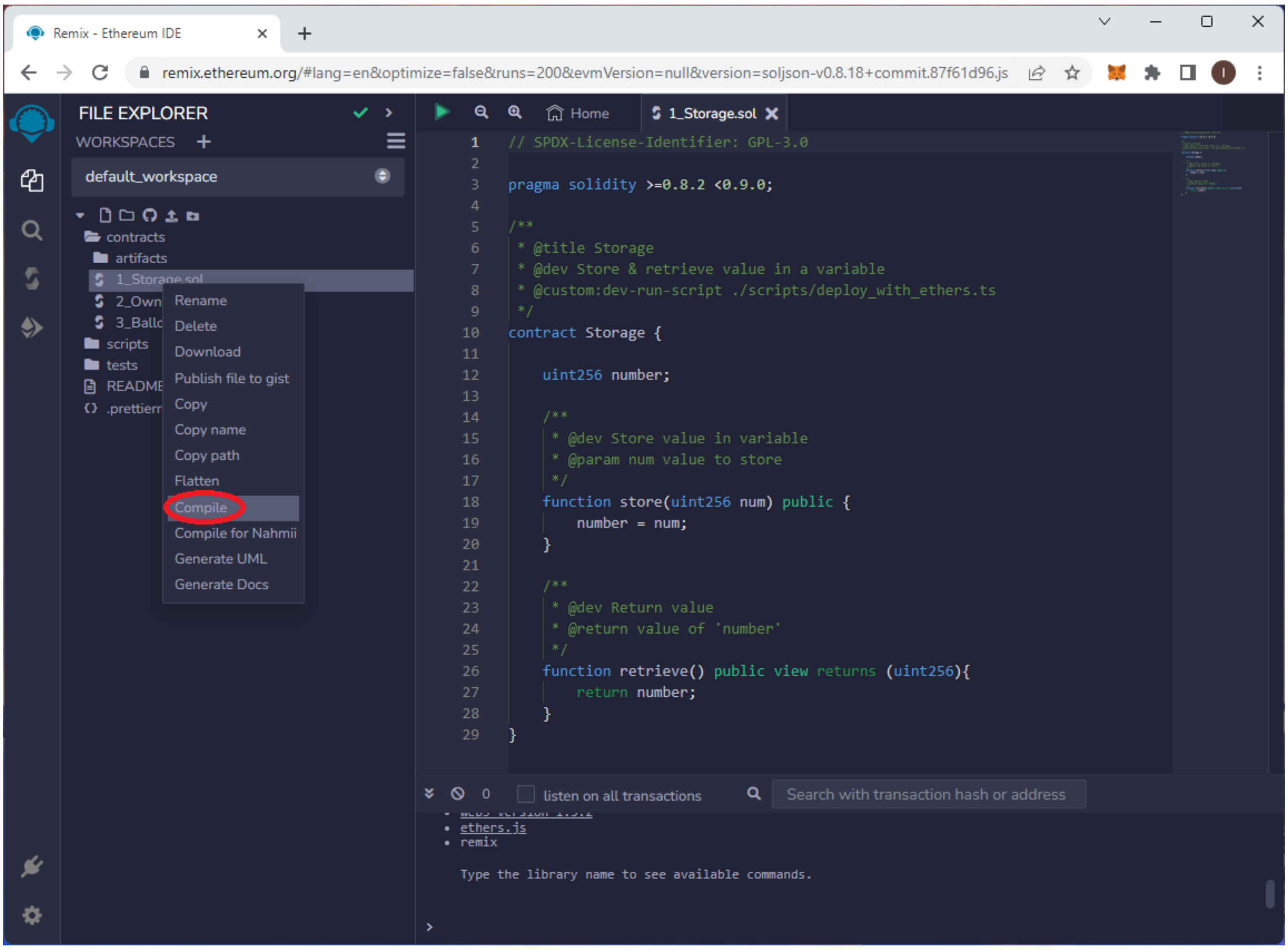
```
• ethers.js
• remix

  Type the library name to see available commands.

>
```

On the right you can see the contract source code. This contract provides two functions. The first (`store`) allows you to save any number in the contract, and the second (`retrieve`) allows you to read it.

3. Compile the contract by right-clicking on the file name, then select **Compile**.



```
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/**
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 * @dev Store & retrieve value in a variable
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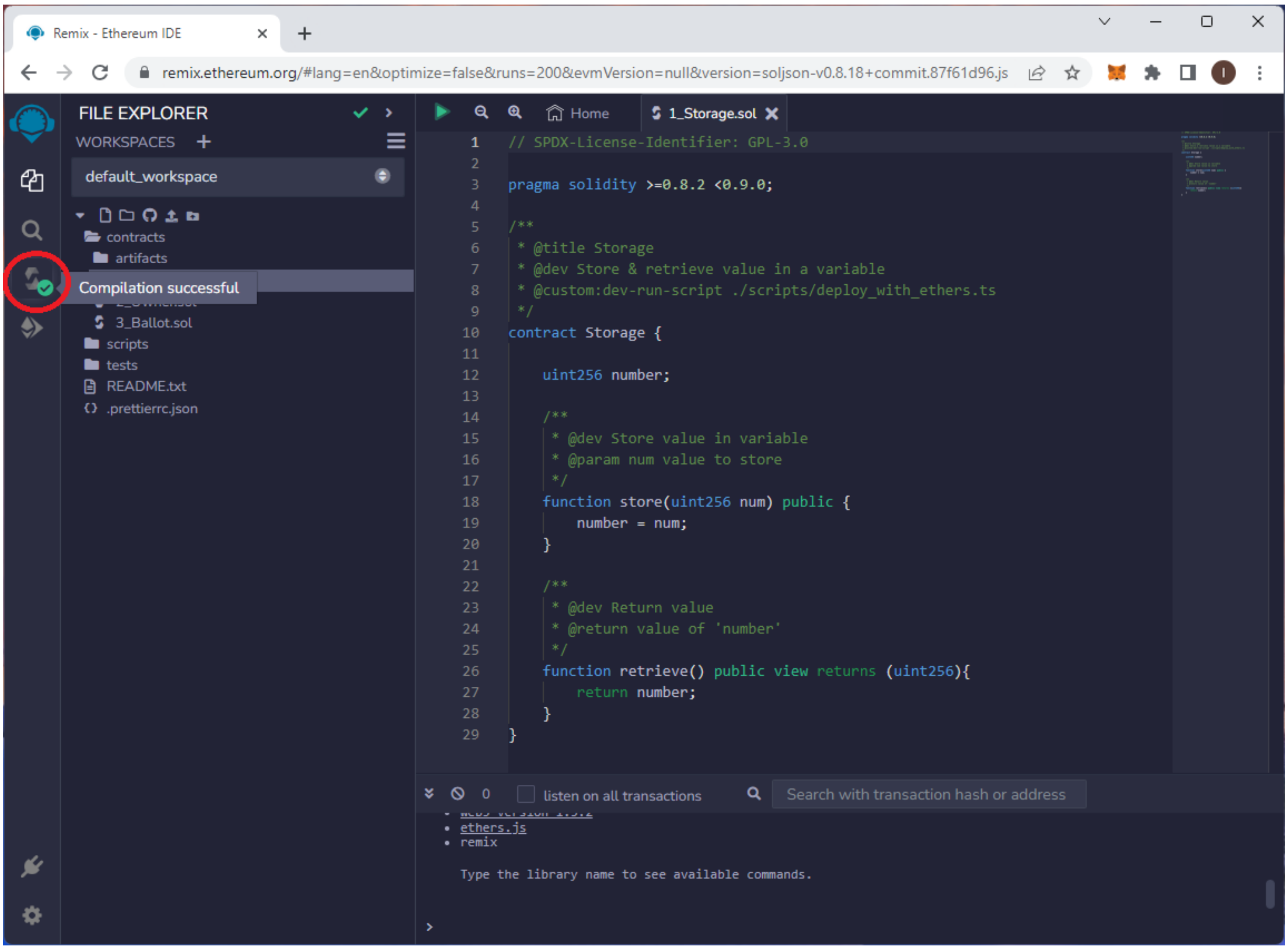
    /**
     * @dev Return value
     * @return value of 'number'
     */
    function retrieve() public view returns (uint256){
        return number;
    }
}
```

```
• ethers.js
• remix

  Type the library name to see available commands.
```

4. When the source code does not contain any errors and compilation is successful, you will see a green success icon.



Remix - Ethereum IDE
remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js
FILE EXPLORER
WORKSPACES
default_workspace
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1_Storage.sol
listen on all transactions
Search with transaction hash or address

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    uint256 number;

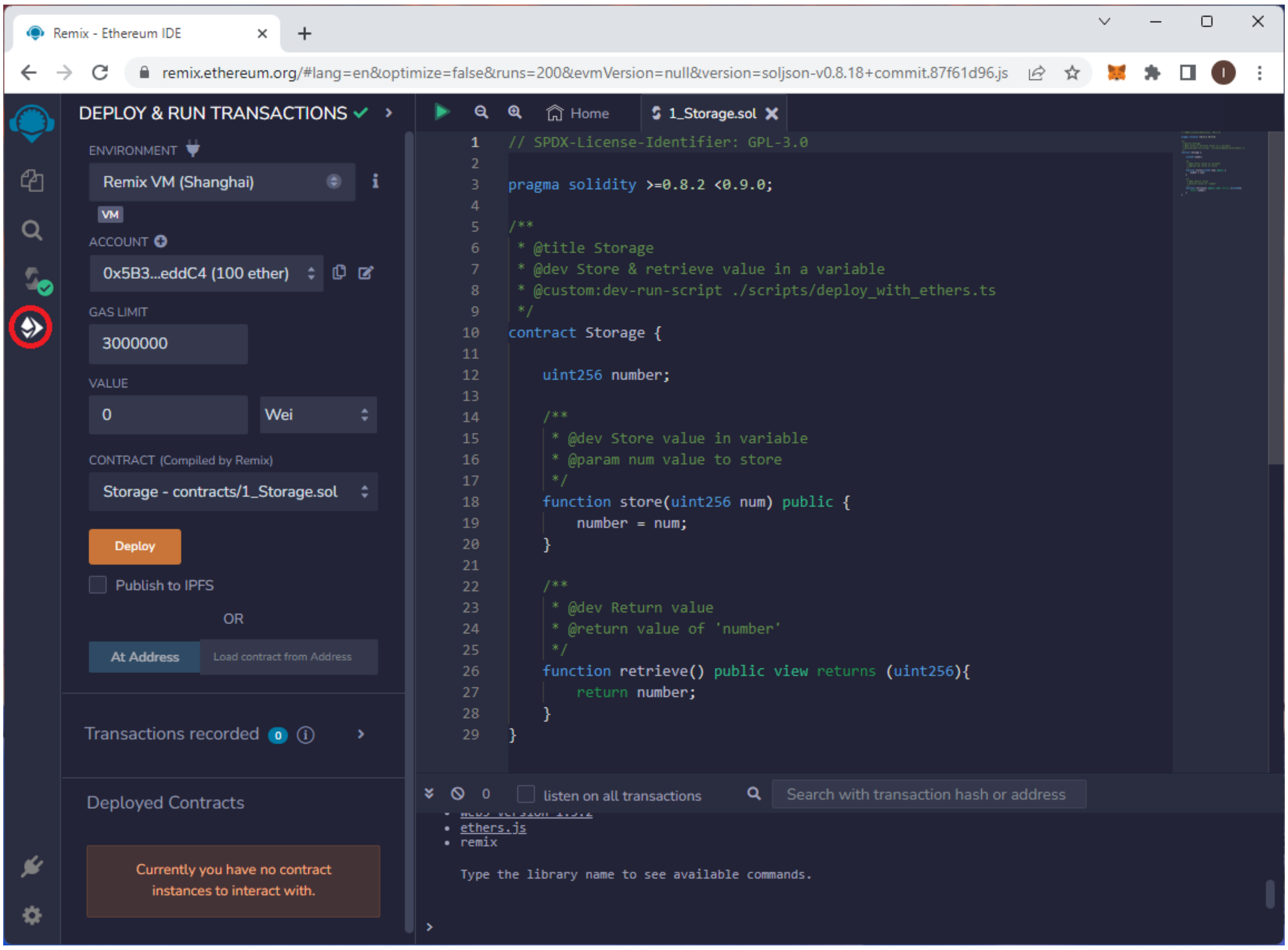
    /**
     * @dev Store value in variable
     * @param num value to store
     */
    function store(uint256 num) public {
        number = num;
    }

    /**
     * @dev Return value
     * @return value of 'number'
     */
    function retrieve() public view returns (uint256){
        return number;
    }
}
```

```
• ethers.js
• remix

  Type the library name to see available commands.
```

5. Go to the **Deploy** tab.


Remix - Ethereum IDE
remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js
DEPLOY & RUN TRANSACTIONS
Home
1_Storage.sol

ENVIRONMENT
Remix VM (Shanghai)
VM
ACCOUNT
0x5B3...eddC4 (100 ether)
GAS LIMIT
3000000
VALUE
0 Wei
CONTRACT (Compiled by Remix)
Storage - contracts/1_Storage.sol
Deploy
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 0
Deployed Contracts
Currently you have no contract instances to interact with.

```
// SPDX-License-Identifier: GPL-3.0

pragma solidity >=0.8.2 <0.9.0;

/**
 * @title Storage
 * @dev Store & retrieve value in a variable
 * @custom:dev-run-script ./scripts/deploy_with_ethers.ts
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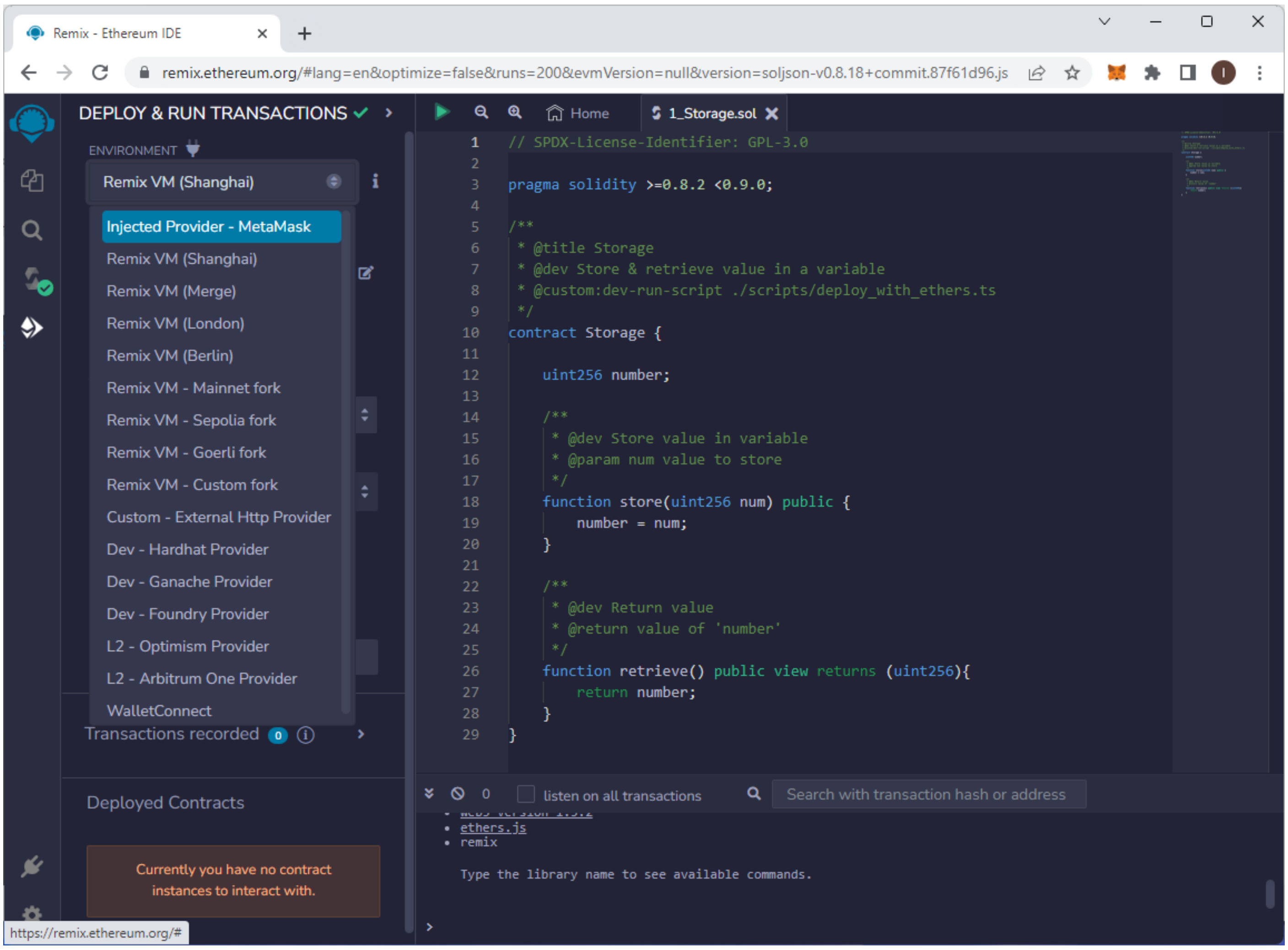
    /**
     * @dev Return value
     * @return value of 'number'
     */
    function retrieve() public view returns (uint256){
        return number;
    }
}
```

0 listen on all transactions
Search with transaction hash or address

```
 • ethers.js
 • remix

 Type the library name to see available commands.
```

6. Expand the **Environment** list and select **Injected Provider - MetaMask**.


Remix - Ethereum IDE
remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js
DEPLOY & RUN TRANSACTIONS
ENVIRONMENT
Remix VM (Shanghai)
Injected Provider - MetaMask
Remix VM (Shanghai)
Remix VM (Merge)
Remix VM (London)
Remix VM (Berlin)
Remix VM - Mainnet fork
Remix VM - Sepolia fork
Remix VM - Goerli fork
Remix VM - Custom fork
Custom - External Http Provider
Dev - Hardhat Provider
Dev - Ganache Provider
Dev - Foundry Provider
L2 - Optimism Provider
L2 - Arbitrum One Provider
WalletConnect
Transactions recorded 0
Deployed Contracts
Currently you have no contract instances to interact with.
https://remix.ethereum.org/#
Home
1_Storage.sol
0
listen on all transactions
Search with transaction hash or address

```
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pragma solidity >=0.8.2 <0.9.0;

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    }

    /**
     * @dev Return value
     * @return value of 'number'
     */
    function retrieve() public view returns (uint256){
        return number;
    }
}
```

```
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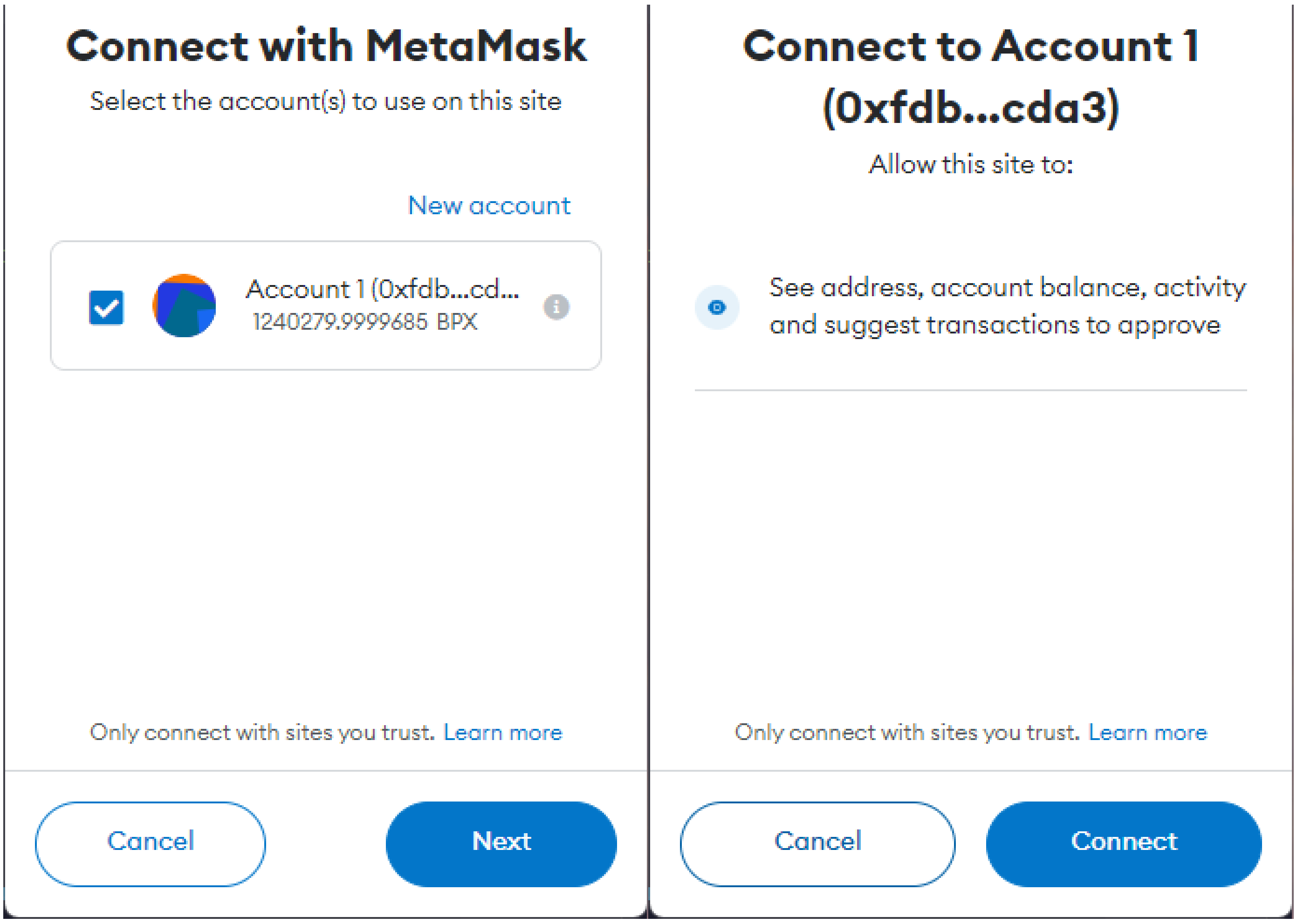
 • remix

 Type the library name to see available commands.
>
```

7. Now Metamask will ask you for permission to connect to the Remix IDE. Agree to connect.


Connect with MetaMask

Select the account(s) to use on this site

Account 1 (0xfdb...cd...

1240279.9999685 BPX

Only connect with sites you trust. Learn more

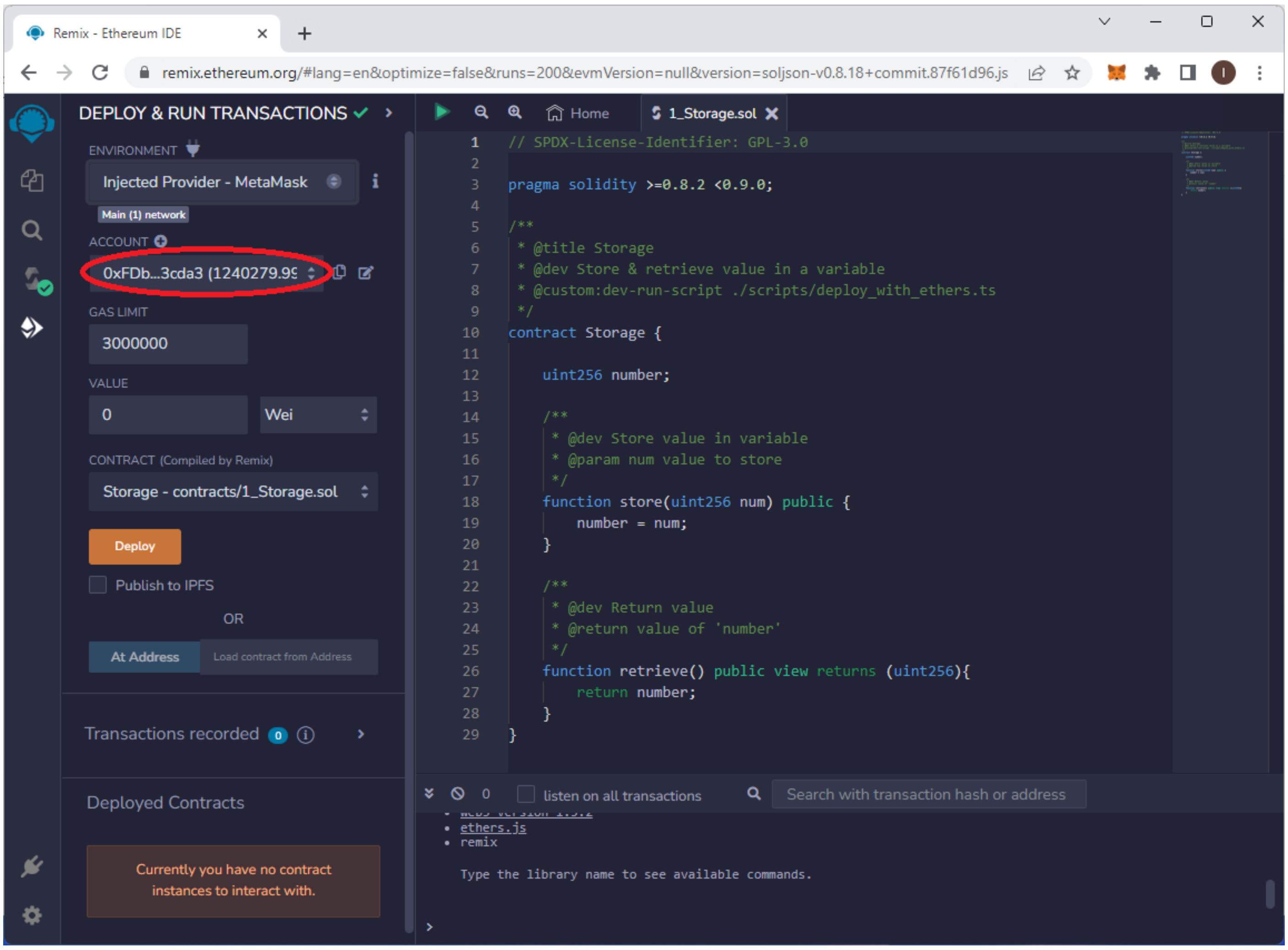
Connect to Account 1 (0xfdb...cda3)

Allow this site to:

See address, account balance, activity and suggest transactions to approve

Only connect with sites you trust. Learn more

8. After successfully connecting, you should see your account address and its balance in the marked field.



remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js

DEPLOY & RUN TRANSACTIONS

ENVIRONMENT: Injected Provider - MetaMask

Main (1) network

ACCOUNT: 0xFDb...3cda3 (1240279.9

GAS LIMIT: 3000000

VALUE: 0 Wei

CONTRACT (Compiled by Remix): Storage - contracts/1_Storage.sol

Deploy

Publish to IPFS

OR

At Address | Load contract from Address

Transactions recorded 0

Deployed Contracts

Currently you have no contract instances to interact with.

1_Storage.sol

```
// SPDX-License-Identifier: GPL-3.0

pragma solidity >=0.8.2 <0.9.0;

/**
 * @title Storage
 * @dev Store & retrieve value in a variable
 * @custom:dev-run-script ./scripts/deploy_with_ethers.ts
 */
contract Storage {

    uint256 number;

    /**
     * @dev Store value in variable
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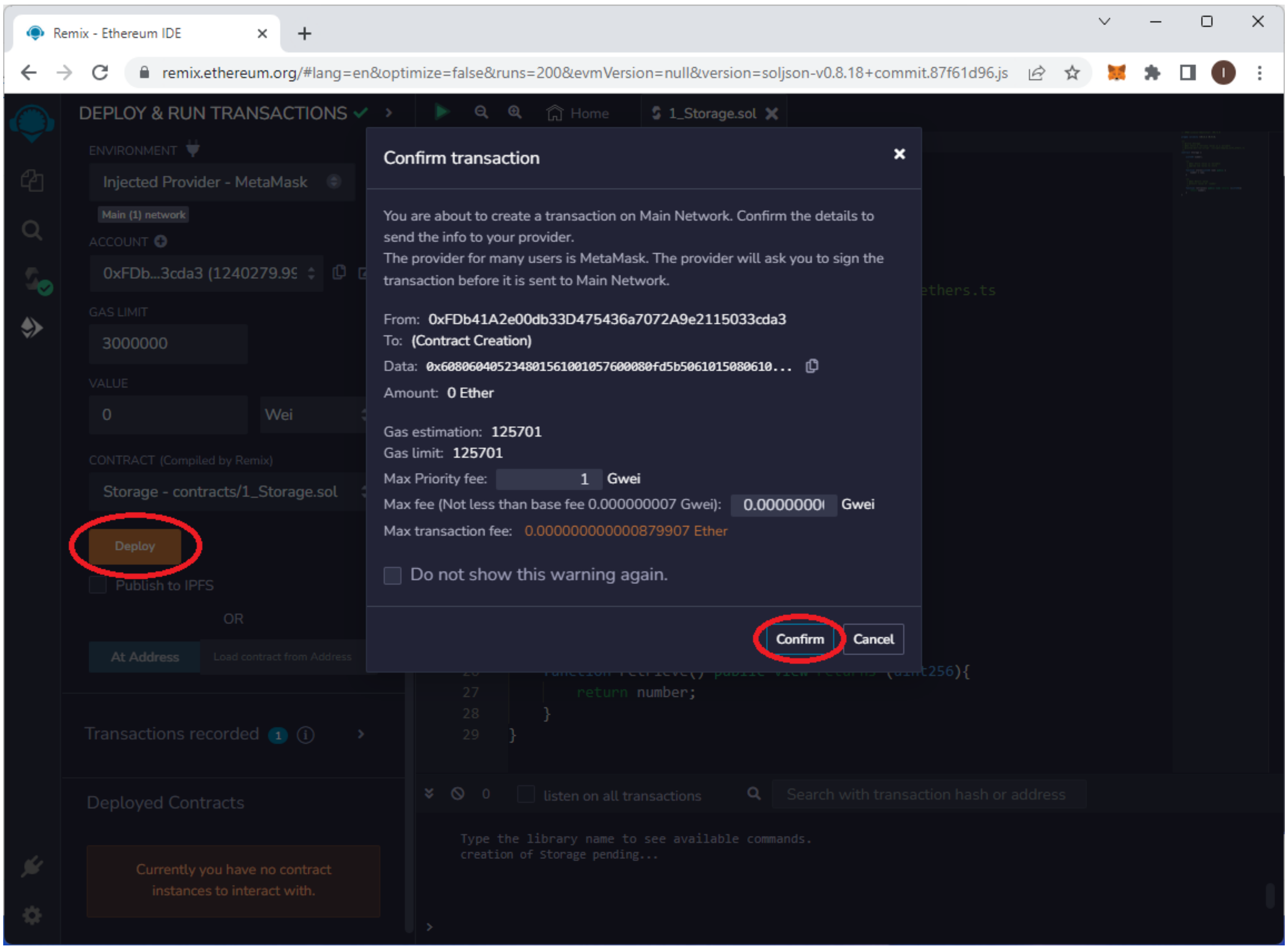
     */
    function store(uint256 num) public {
        number = num;
    }

    /**
     * @dev Return value
     * @return value of 'number'
     */
    function retrieve() public view returns (uint256){
        return number;
    }
}
```

```
• ethers.js
• remix

Type the library name to see available commands.
```

9. Click **Deploy** to start deploying your contract. Confirm the suggested gas settings.


Confirm transaction

You are about to create a transaction on Main Network. Confirm the details to send the info to your provider.
The provider for many users is MetaMask. The provider will ask you to sign the transaction before it is sent to Main Network.

From: 0xFDb41A2e00db33D475436a7072A9e2115033cda3
To: (Contract Creation)
Data: 0x608060405234801561001057600080fd5b5061015080610...
Amount: 0 Ether

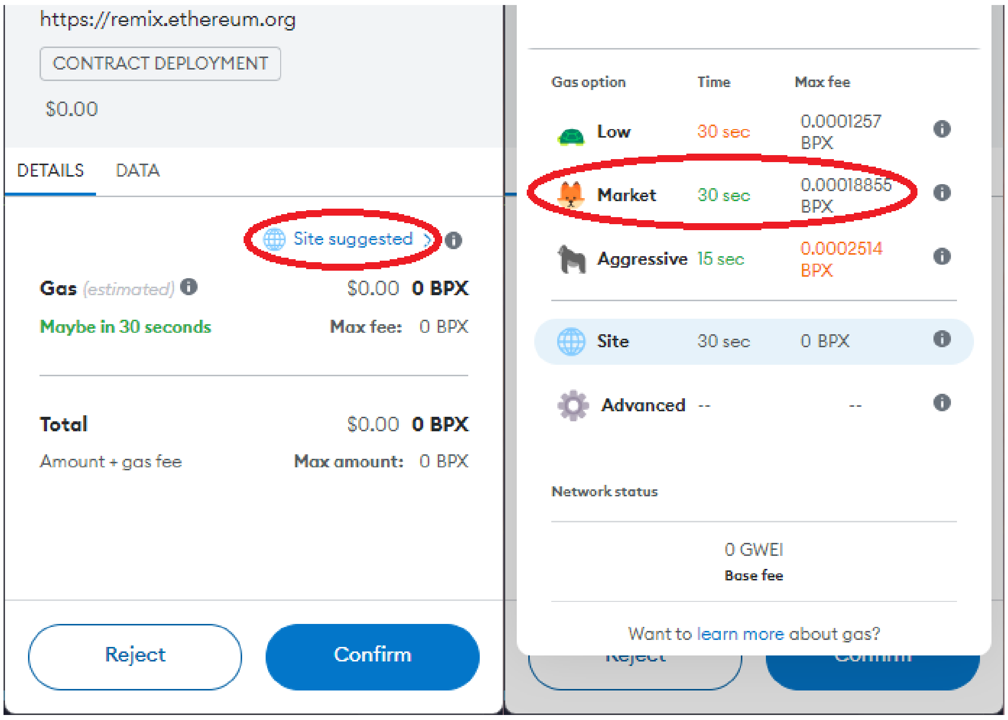
Gas estimation: 125701
Gas limit: 125701
Max Priority fee: 1 Gwei
Max fee (Not less than base fee 0.000000007 Gwei): 0.0000000(Gwei
Max transaction fee: 0.000000000000879907 Ether

Do not show this warning again.

Confirm
Cancel
DEPLOY & RUN TRANSACTIONS
ENVIRONMENT
Injected Provider - MetaMask
Main (1) network
ACCOUNT
0xFDb...3cda3 (1240279.9
GAS LIMIT
3000000
VALUE
0
Wei
CONTRACT (Compiled by Remix)
Storage - contracts/1_Storage.sol
Deploy
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 1
Deployed Contracts
Currently you have no contract instances to interact with.
Home
1_Storage.sol
listen on all transactions
Search with transaction hash or address
Remix - Ethereum IDE
remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js

```
Type the library name to see available commands.
creation of Storage pending...
```

10. In the Metamask popup window, change the gas settings by clicking on **Site suggested**, then select the **Market** option. Then confirm the transaction.


https://remix.ethereum.org

CONTRACT DEPLOYMENT

$0.00

DETAILS DATA

Site suggested

Gas (estimated) $0.00 **0 BPX**

Maybe in 30 seconds Max fee: 0 BPX

Total $0.00 **0 BPX**

Amount + gas fee Max amount: 0 BPX

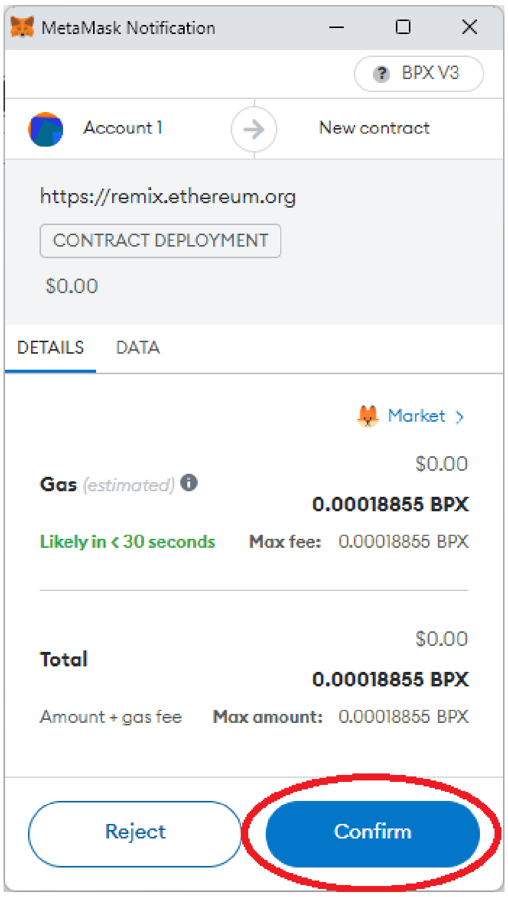
Reject Confirm

Gas option	Time	Max fee
Low	30 sec	0.0001257 BPX
Market	30 sec	0.00018855 BPX
Aggressive	15 sec	0.0002514 BPX
Site	30 sec	0 BPX
Advanced	--	--

Network status

0 GWEI
Base fee

Want to learn more about gas?


MetaMask Notification

BPX V3

Account 1 → New contract

https://remix.ethereum.org

CONTRACT DEPLOYMENT

$0.00

DETAILS DATA

Market

Gas (estimated) $0.00 **0.00018855 BPX**

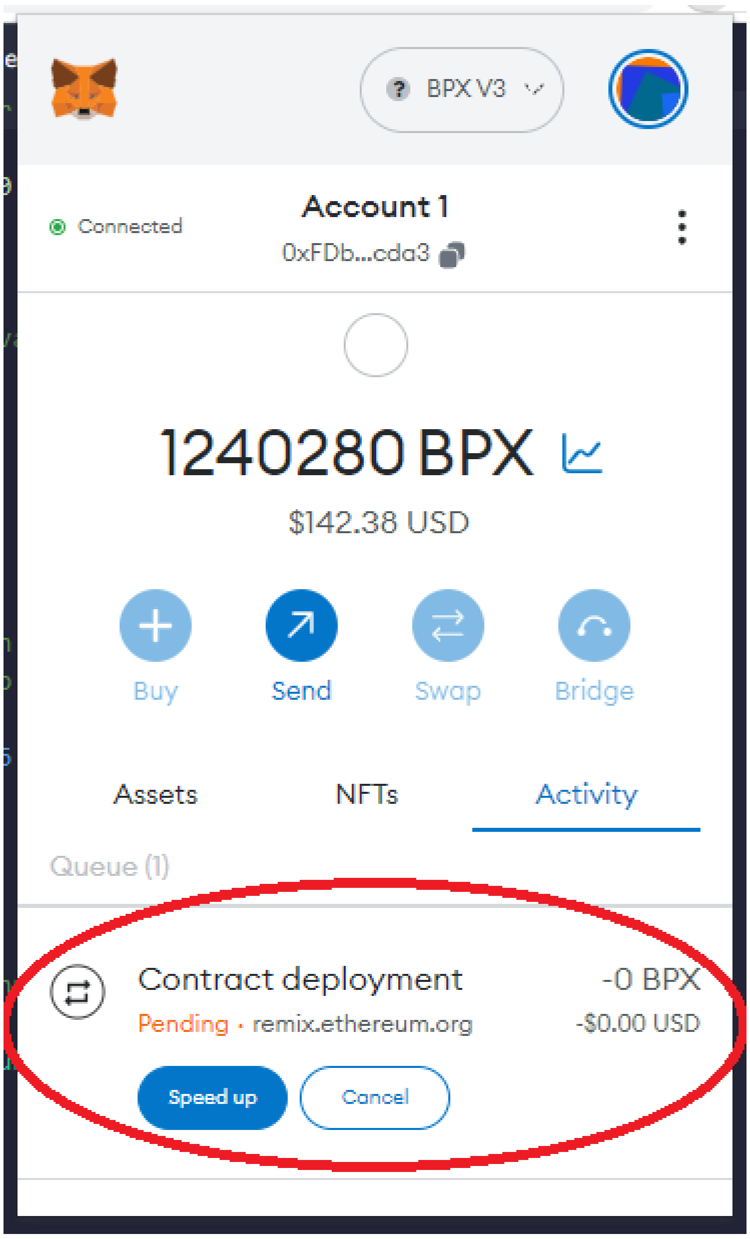
Likely in < 30 seconds Max fee: 0.00018855 BPX

Total $0.00 **0.00018855 BPX**

Amount + gas fee Max amount: 0.00018855 BPX

Reject Confirm

11. Your contract is now deploying. If you open the Metamask window, you should see the new pending transaction.



Connected

Account 1

0xFDb...cda3

1240280 BPX

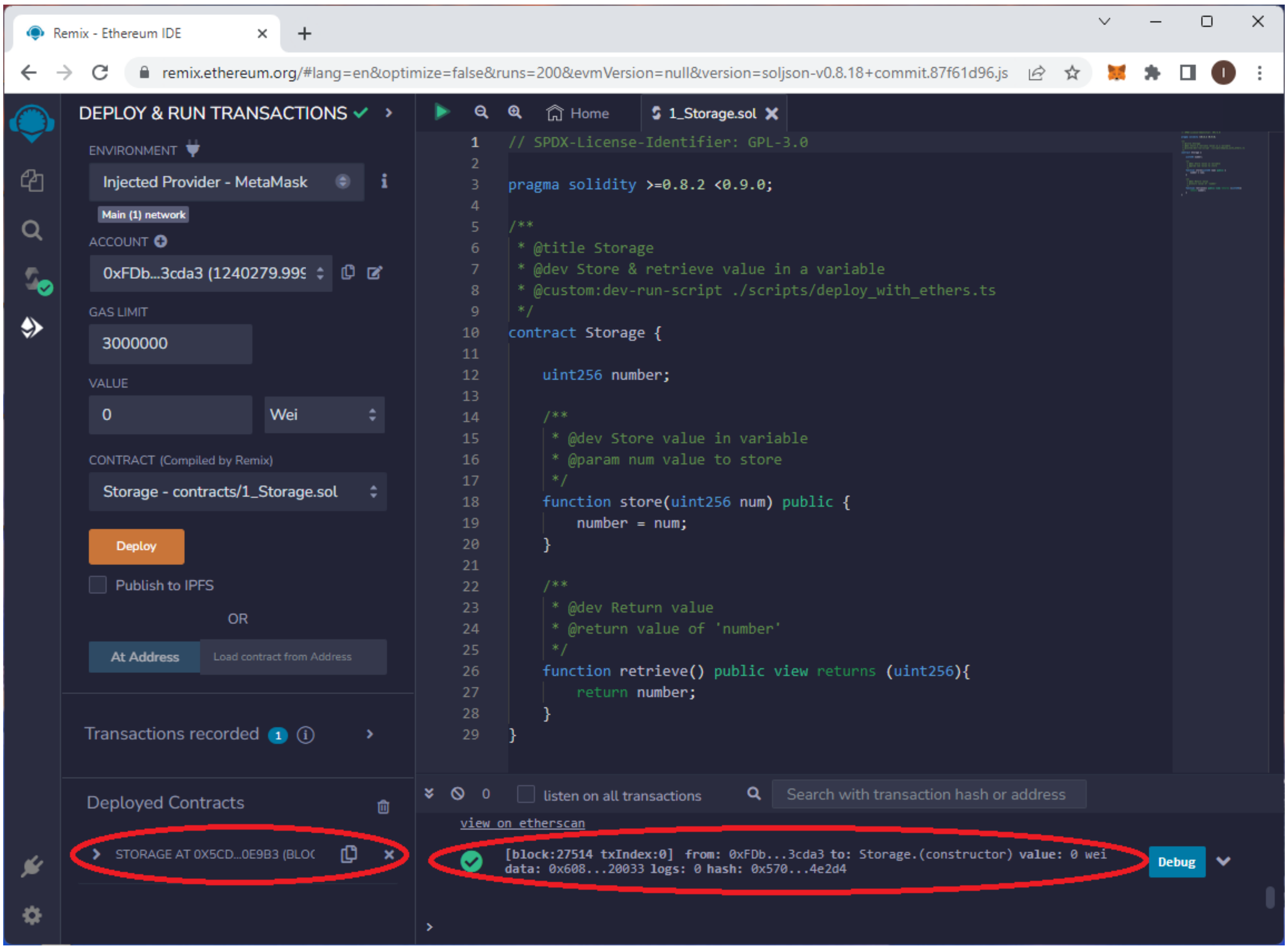
$142.38 USD

Queue (1)

Contract deployment -0 BPX

Pending · remix.ethereum.org -$0.00 USD

12. Once the transaction is confirmed by blockchain, you will see its confirmation and a new item in the **Deployed Contracts** section. Your contract is deployed.


Remix - Ethereum IDE
remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js
DEPLOY & RUN TRANSACTIONS
Home
1_Storage.sol
Deploy
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 1
Deployed Contracts
listen on all transactions
Search with transaction hash or address
view on etherscan
Debug

ENVIRONMENT: Injected Provider - MetaMask (Main (1) network)

ACCOUNT: 0xFDb...3cda3 (1240279.99

GAS LIMIT: 3000000

VALUE: 0 Wei

CONTRACT (Compiled by Remix): Storage - contracts/1_Storage.sol

```
// SPDX-License-Identifier: GPL-3.0

pragma solidity >=0.8.2 <0.9.0;

/**
 * @title Storage
 * @dev Store & retrieve value in a variable
 * @custom:dev-run-script ./scripts/deploy_with_ethers.ts
 */
contract Storage {

    uint256 number;

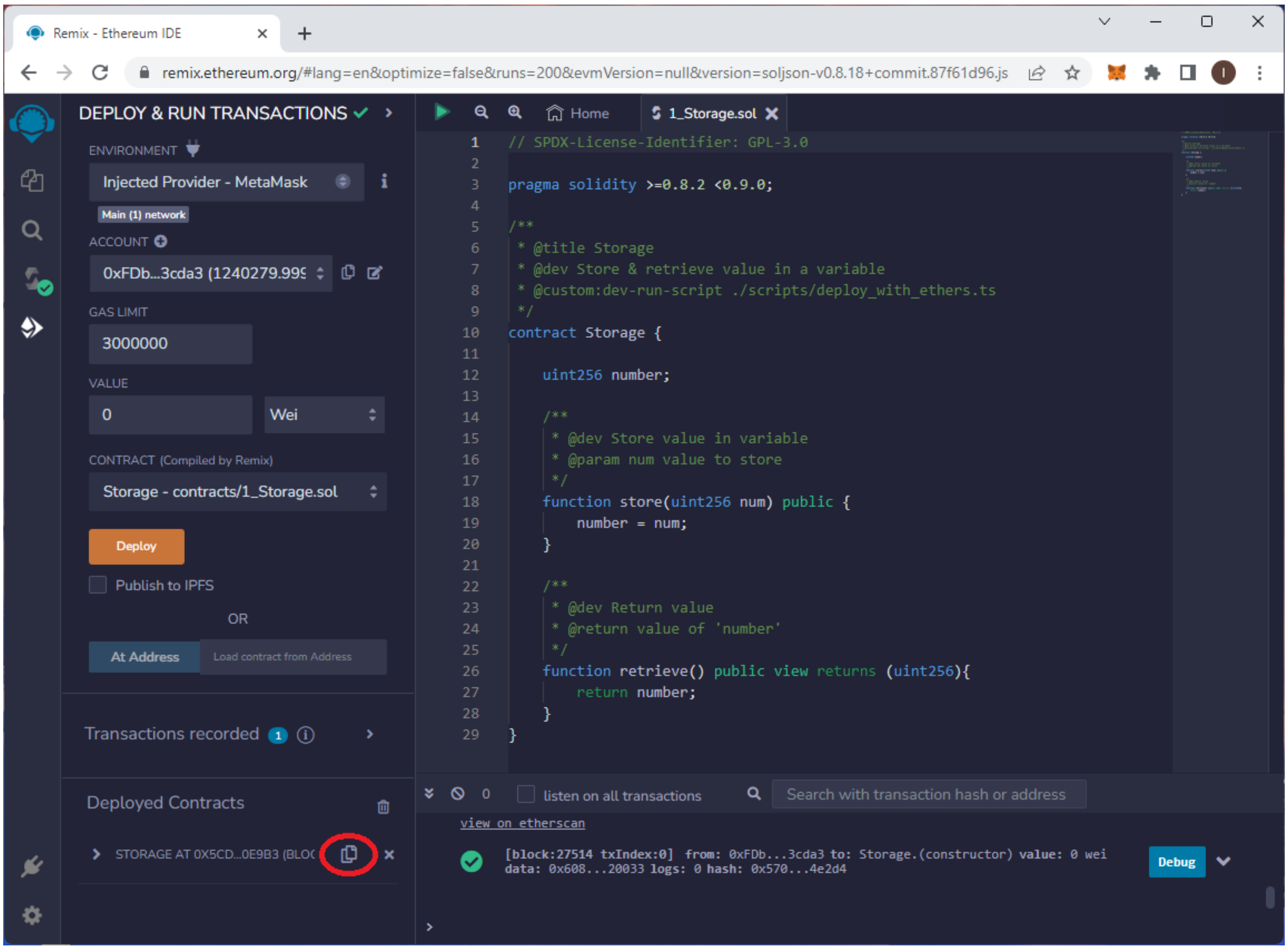
    /**
     * @dev Store value in variable
     * @param num value to store
     */
    function store(uint256 num) public {
        number = num;
    }

    /**
     * @dev Return value
     * @return value of 'number'
     */
    function retrieve() public view returns (uint256){
        return number;
    }
}
```

STORAGE AT 0X5CD...0E9B3 (BLOC

```
[block:27514 txIndex:0] from: 0xFDb...3cda3 to: Storage.(constructor) value: 0 wei
data: 0x608...20033 logs: 0 hash: 0x570...4e2d4
```

13. You can use the marked button to copy the address of your new contract to interact with it in the future.


Remix - Ethereum IDE
remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js
DEPLOY & RUN TRANSACTIONS
Home
1_Storage.sol

ENVIRONMENT: Injected Provider - MetaMask
Main (1) network
ACCOUNT: 0xFDb...3cda3 (1240279.999
GAS LIMIT: 3000000
VALUE: 0 Wei
CONTRACT (Compiled by Remix): Storage - contracts/1_Storage.sol

Deploy
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 1
Deployed Contracts
STORAGE AT 0X5CD...0E9B3 (BLOC

```
// SPDX-License-Identifier: GPL-3.0

pragma solidity >=0.8.2 <0.9.0;

/**
 * @title Storage
 * @dev Store & retrieve value in a variable
 * @custom:dev-run-script ./scripts/deploy_with_ethers.ts
 */
contract Storage {

    uint256 number;

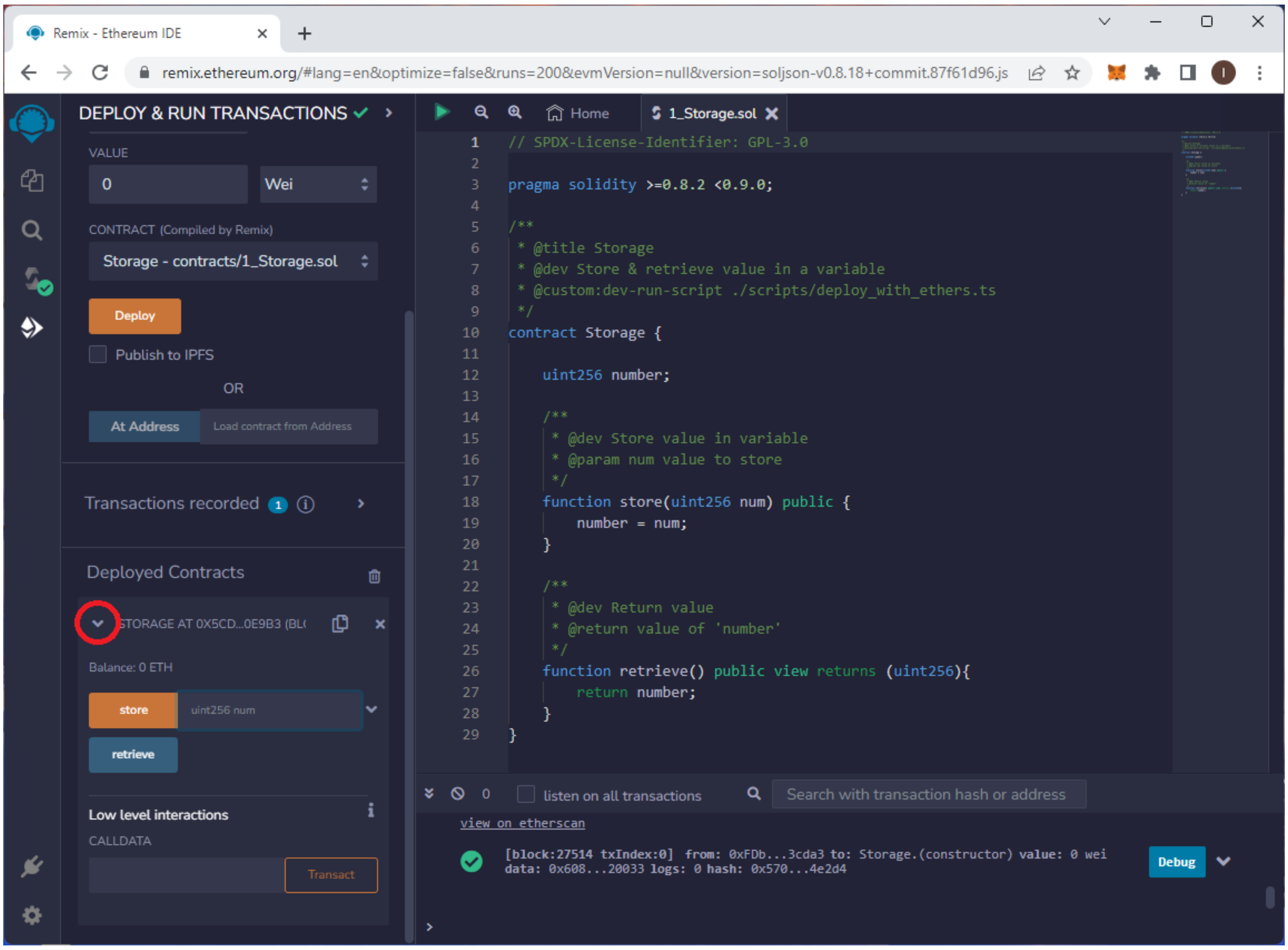
    /**
     * @dev Store value in variable
     * @param num value to store
     */
    function store(uint256 num) public {
        number = num;
    }

    /**
     * @dev Return value
     * @return value of 'number'
     */
    function retrieve() public view returns (uint256){
        return number;
    }
}
```

0
listen on all transactions
Search with transaction hash or address
view on etherscan
Debug

```
[block:27514 txIndex:0] from: 0xFDb...3cda3 to: Storage.(constructor) value: 0 wei
data: 0x608...20033 logs: 0 hash: 0x570...4e2d4
```

14. Now you can test the contract by calling its functions. Expand the list of contract methods.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DEPLOY & RUN TRANSACTIONS
Home
1_Storage.sol
Deploy
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 1
Deployed Contracts
STORAGE AT 0X5CD...0E9B3 (BL
store
uint256 num
retrieve
Low level interactions
CALLDATA
Transact
listen on all transactions
Search with transaction hash or address
view on etherscan
Debug

VALUE: 0 Wei

CONTRACT (Compiled by Remix): Storage - contracts/1_Storage.sol

Balance: 0 ETH

```solidity
// SPDX-License-Identifier: GPL-3.0

pragma solidity >=0.8.2 <0.9.0;

/**
 * @title Storage
 * @dev Store & retrieve value in a variable
 * @custom:dev-run-script ./scripts/deploy_with_ethers.ts
 */
contract Storage {

    uint256 number;

    /**
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     */
    function store(uint256 num) public {
        number = num;
    }

    /**
     * @dev Return value
     * @return value of 'number'
     */
    function retrieve() public view returns (uint256){
        return number;
    }
}
```
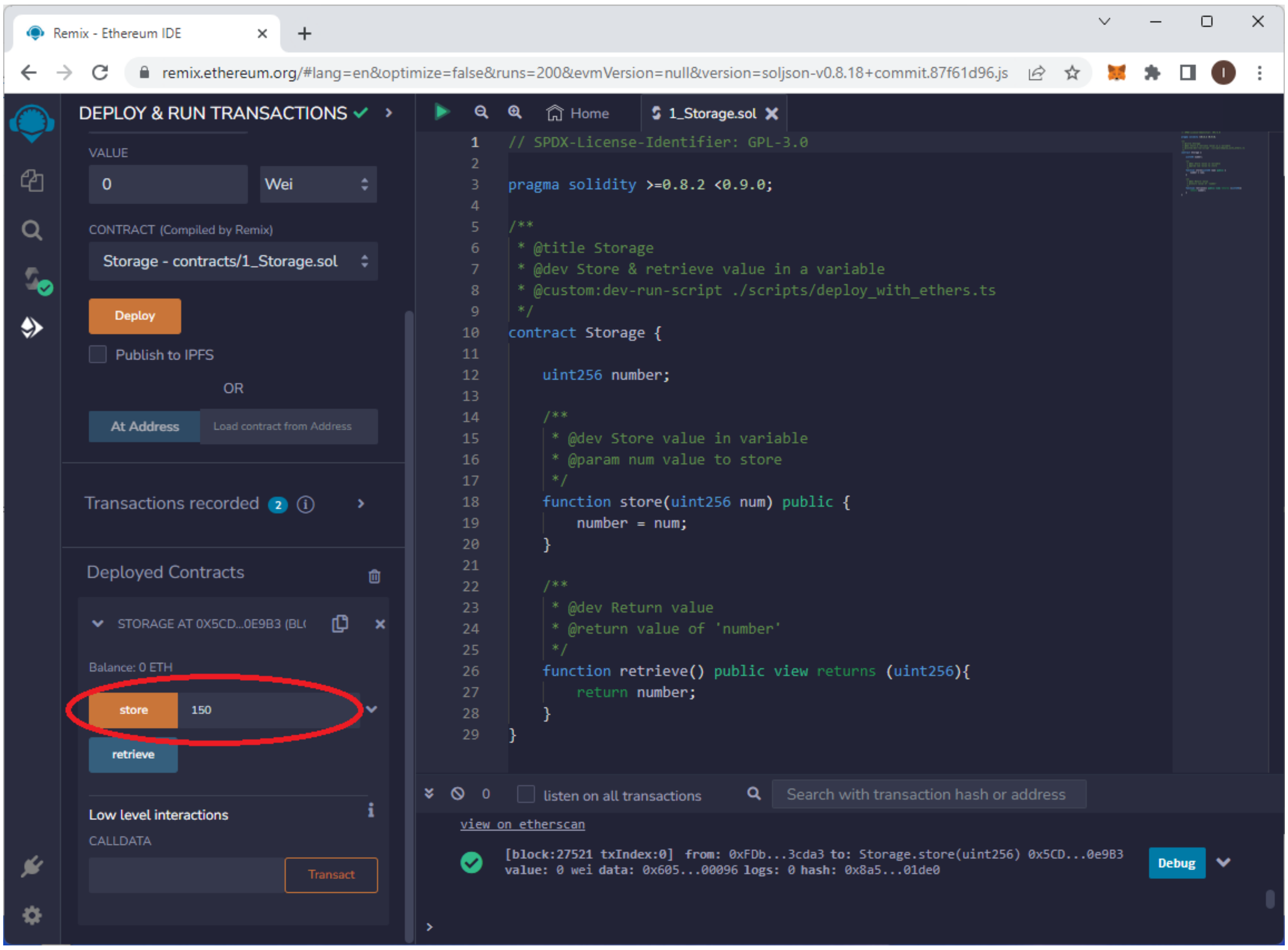

```
[block:27514 txIndex:0] from: 0xFDb...3cda3 to: Storage.(constructor) value: 0 wei
data: 0x608...20033 logs: 0 hash: 0x570...4e2d4
```

15. Let's call the first function (`store`) to save any number in the contract. Enter random number in the text field next to the **store** button. Then press the **store** button.



Remix - Ethereum IDE
remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js
DEPLOY & RUN TRANSACTIONS
VALUE
0
Wei
CONTRACT (Compiled by Remix)
Storage - contracts/1_Storage.sol
Deploy
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 2
Deployed Contracts
STORAGE AT 0X5CD...0E9B3 (BL
Balance: 0 ETH
store
150
retrieve
Low level interactions
CALLDATA
Transact
Home
1_Storage.sol
listen on all transactions
Search with transaction hash or address
view on etherscan
Debug

```
// SPDX-License-Identifier: GPL-3.0

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contract Storage {

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     * @param num value to store
     */
    function store(uint256 num) public {
        number = num;
    }

    /**
     * @dev Return value
     * @return value of 'number'
     */
    function retrieve() public view returns (uint256){
        return number;
    }
}
```
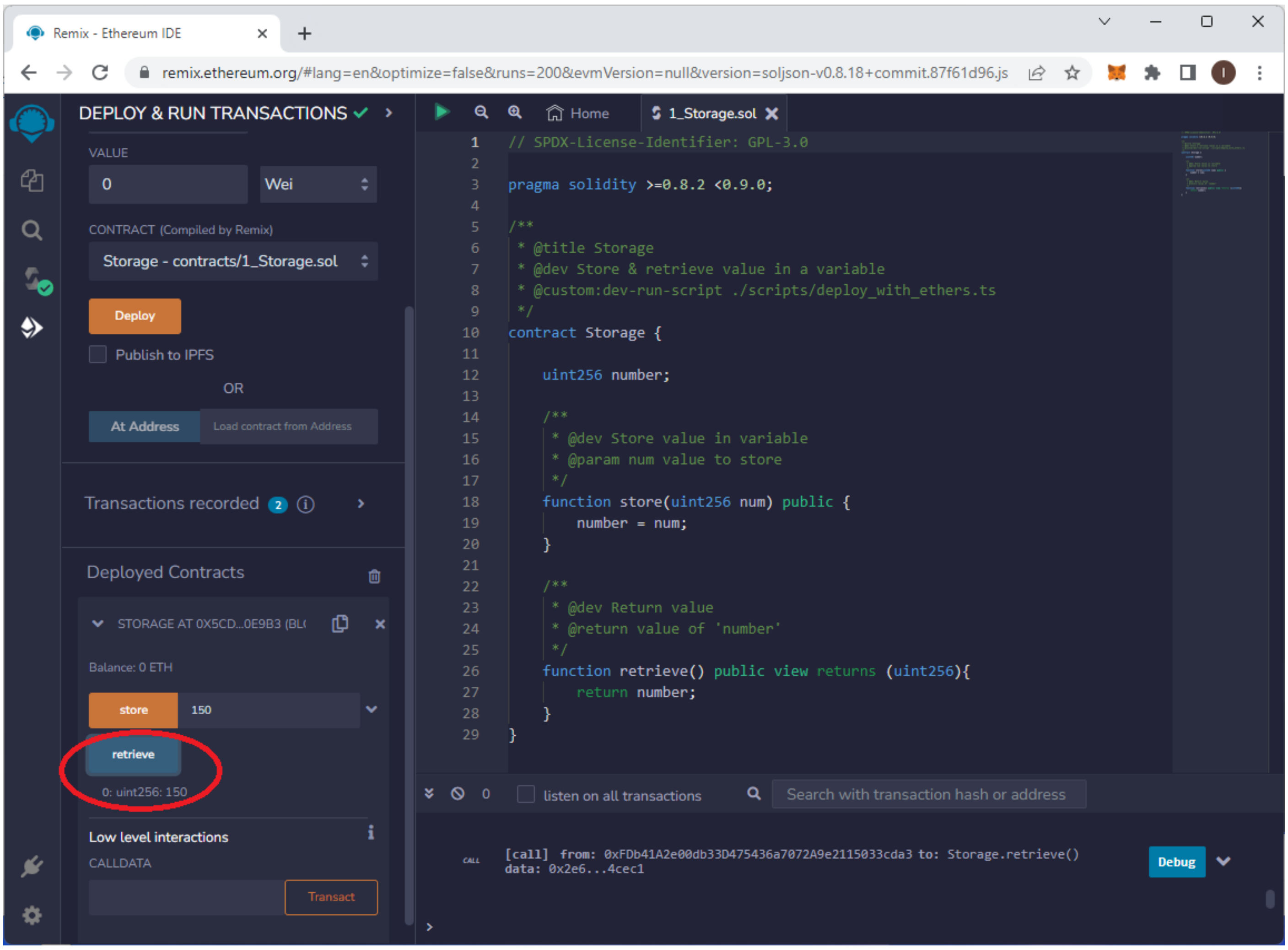

```
[block:27521 txIndex:0] from: 0xFDb...3cda3 to: Storage.store(uint256) 0x5CD...0e9B3
value: 0 wei data: 0x605...00096 logs: 0 hash: 0x8a5...01de0
```

16. Confirm the transaction in your wallet in the same way as when deploying the contract. Saving data to a smart contract requires a transaction on the blockchain.

17. When the transaction is confirmed, call the second function (`retrieve`) to read the number stored in the smart contract. Click the **retrieve** function button. The blockchain will return the value stored in the contract.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listen on all transactions
Search with transaction hash or address
Debug

VALUE
0 Wei

CONTRACT (Compiled by Remix)
Storage - contracts/1_Storage.sol

STORAGE AT 0X5CD...0E9B3 (BL(

Balance: 0 ETH

store 150

0: uint256: 150

```
// SPDX-License-Identifier: GPL-3.0

pragma solidity >=0.8.2 <0.9.0;

/**
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contract Storage {

    uint256 number;

    /**
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        number = num;
    }

    /**
     * @dev Return value
     * @return value of 'number'
     */
    function retrieve() public view returns (uint256){
        return number;
    }
}
```

```
CALL  [call] from: 0xFDb41A2e00db33D475436a7072A9e2115033cda3 to: Storage.retrieve()
      data: 0x2e6...4cec1
```

Revision #1
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