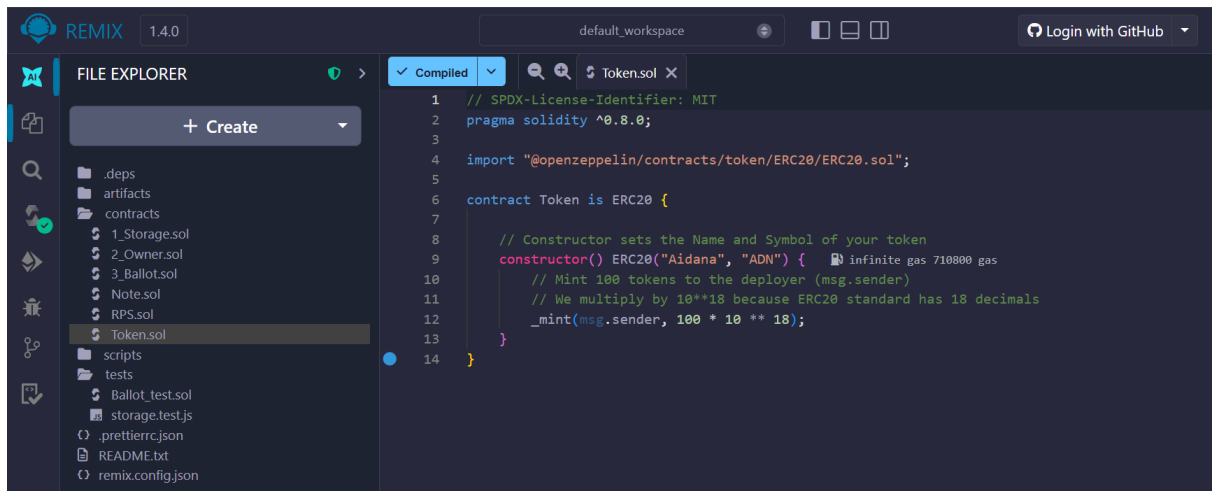


Assignment 11

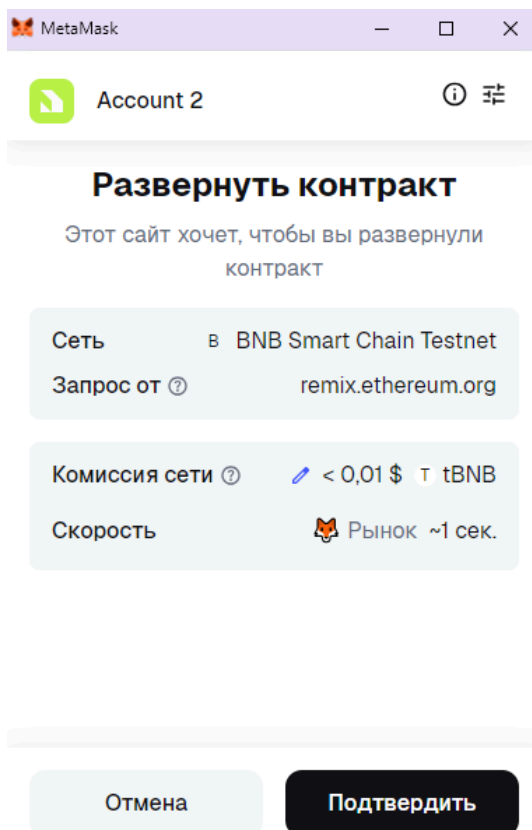
Part 1: Create Your Own Cryptocurrency (ERC20)

1. I created a "Token.sol" file in Remix IDE, pasted the provided code, compiled it, then deployed it and confirmed the transaction in MetaMask. The contract was deployed successfully.



The screenshot shows the Remix IDE interface. On the left is the 'FILE EXPLORER' with a list of files including .deps, artifacts, contracts, 1_Storage.sol, 2_Owner.sol, 3_Ballot.sol, Note.sol, RPS.sol, Token.sol (selected), scripts, tests, Ballot_test.sol, storage.test.js, .prettierrc.json, README.txt, and remix.config.json. The main editor displays the code for 'Token.sol' with the following content:

```
1 // SPDX-License-Identifier: MIT
2 pragma solidity ^0.8.0;
3
4 import "@openzeppelin/contracts/token/ERC20/ERC20.sol";
5
6 contract Token is ERC20 {
7
8     // Constructor sets the Name and Symbol of your token
9     constructor() ERC20("Aidana", "ADN") { infinite gas 710800 gas
10         // Mint 100 tokens to the deployer (msg.sender)
11         // We multiply by 10**18 because ERC20 standard has 18 decimals
12         _mint(msg.sender, 100 * 10 ** 18);
13     }
14 }
```



The screenshot shows the MetaMask transaction confirmation screen. At the top, it says 'Account 2'. The main heading is 'Развернуть контракт' (Deploy contract). Below it, a message states: 'Этот сайт хочет, чтобы вы развернули контракт' (This site wants you to deploy the contract). The transaction details are as follows:

- Сеть (Network): BNB Smart Chain Testnet
- Запрос от (Request from): remix.ethereum.org
- Комиссия сети (Network fee): < 0,01 \$ tBNB
- Скорость (Speed): Рынок ~1 сек. (Market ~1 sec.)

At the bottom, there are two buttons: 'Отмена' (Cancel) and 'Подтвердить' (Confirm).

Dec 11, 2025



Развертывание контракта

Подтверждено

-0 TBNB

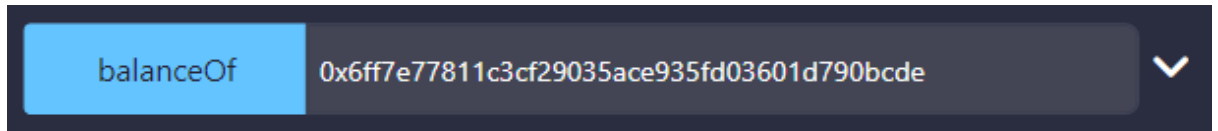
-0 TBNB

<https://testnet.bscscan.com/tx/0x3cb912d9ce217cde2131f295c95ec8b31823e3065514334fe7b33e4ff39500ab>

Contract Address: 0x994154Fe1eC16EEc36875Dcb0c5AF06b8BCCa031

2. To check that my wallet received 100 tokens, I used the **balanceOf** function.

MetaMask wallet address → 0x6ff7e77811c3cf29035ace935fd03601d790bcde



0: uint256: 100000000000000000000

Импорт токенов

BNB Smart Chain Testnet

Пользовательский токен

⚠

Кто угодно может создать токен, в том числе поддельные версии существующих токенов. Узнайте подробнее о [мошенничестве и угрозах безопасности](#).

Адрес контракта токена
0x994154Fe1eC16EEc36875Dcb0c5...

Символ токена
ADN

Число десятичных знаков токена

Далее

Импорт токенов

Хотите импортировать этот токен?

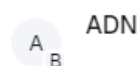
A B

Aidana
100 ADN

Назад

Импорт

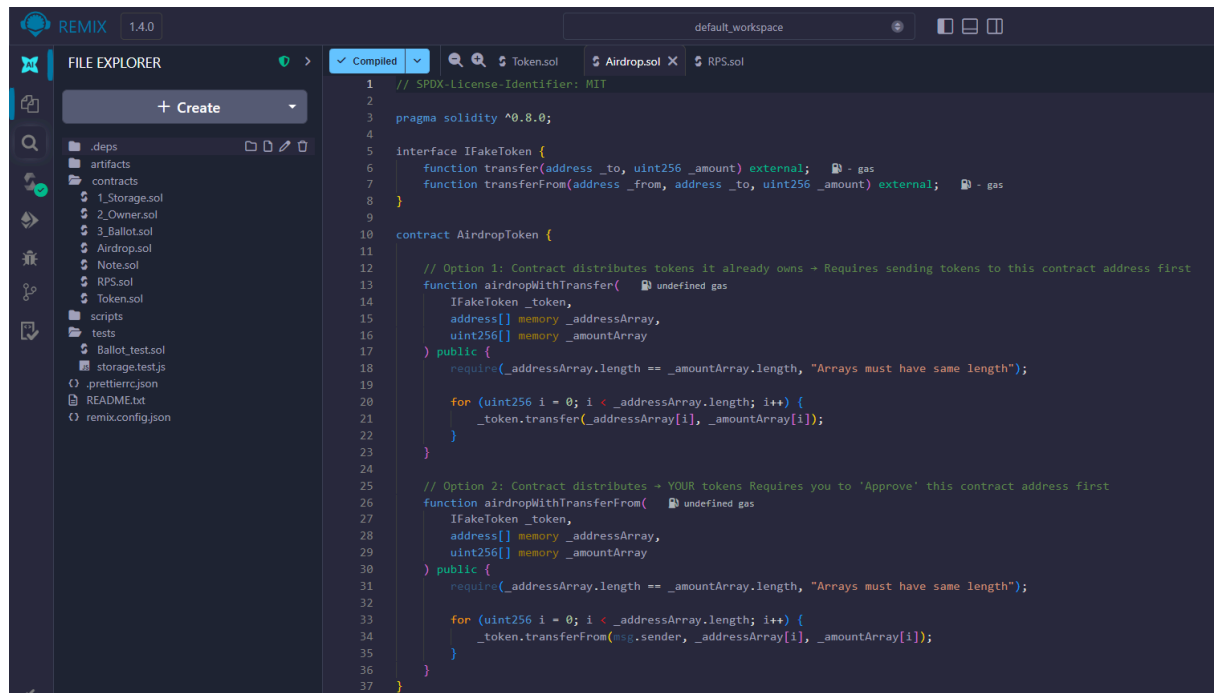
I also imported my token (ADN) into MetaMask to verify that my wallet had received 100 tokens.



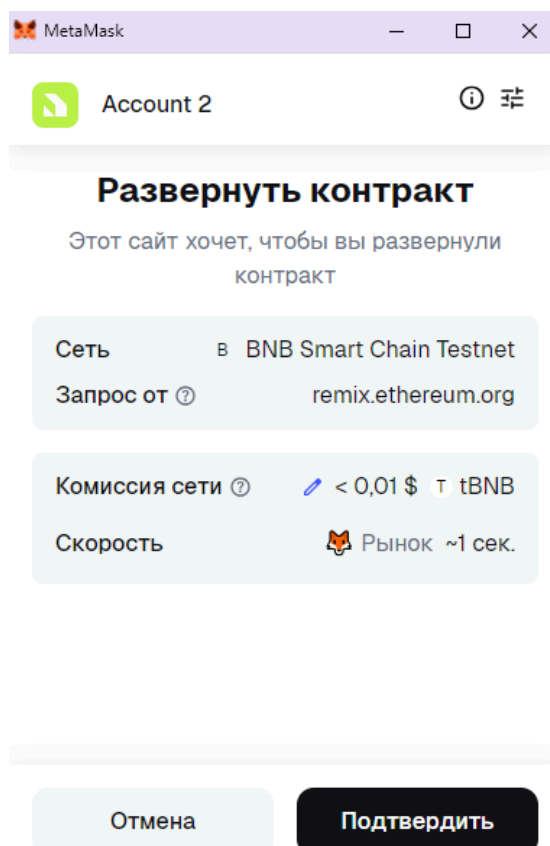
Нет доступного обменного курса
100 ADN

Part 2: Token Distribution (Airdrop System)

1. I created a "Airdrop.sol" file, pasted the provided code into it, compiled it, then deployed it and confirmed it in MetaMask.



```
1 // SPDX-License-Identifier: MIT
2
3 pragma solidity ^0.8.0;
4
5 interface IFakeToken {
6     function transfer(address _to, uint256 _amount) external;
7     function transferFrom(address _from, address _to, uint256 _amount) external;
8 }
9
10 contract AirdropToken {
11
12     // Option 1: Contract distributes tokens it already owns -> Requires sending tokens to this contract address first
13     function airdropWithTransfer(
14         IFakeToken _token,
15         address[] memory _addressArray,
16         uint256[] memory _amountArray
17     ) public {
18         require(_addressArray.length == _amountArray.length, "Arrays must have same length");
19
20         for (uint256 i = 0; i < _addressArray.length; i++) {
21             _token.transfer(_addressArray[i], _amountArray[i]);
22         }
23     }
24
25     // Option 2: Contract distributes + YOUR tokens Requires you to 'Approve' this contract address first
26     function airdropWithTransferFrom(
27         IFakeToken _token,
28         address[] memory _addressArray,
29         uint256[] memory _amountArray
30     ) public {
31         require(_addressArray.length == _amountArray.length, "Arrays must have same length");
32
33         for (uint256 i = 0; i < _addressArray.length; i++) {
34             _token.transferFrom(msg.sender, _addressArray[i], _amountArray[i]);
35         }
36     }
37 }
```



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Развертывание контракта

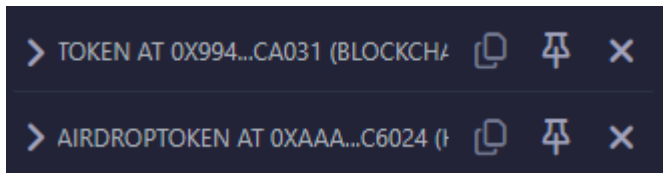
Подтверждено

-0 TBNB

-0 TBNB

<https://testnet.bscscan.com/tx/0xb4b13eb29d57b041c69481a2e93a177a83e61976bcfb5ede778326ed1c614764>

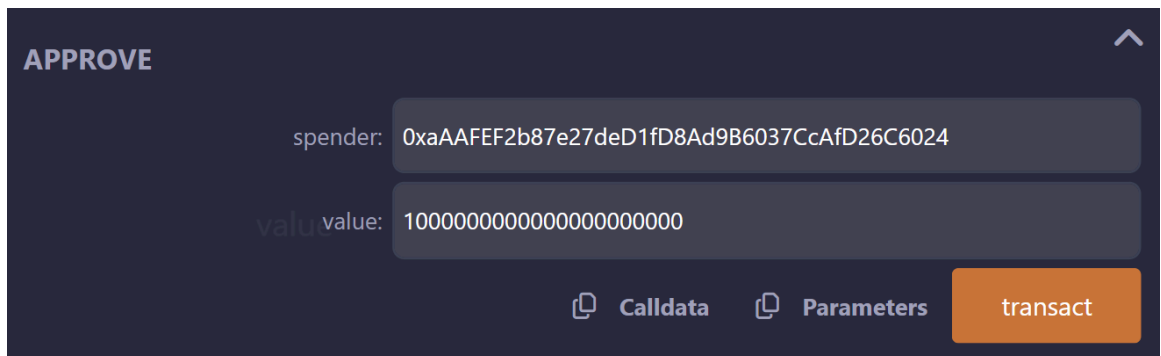
Contract Address: 0xaAAFEF2b87e27deD1fD8Ad9B6037CcAfD26C6024



2. To approve the contract, I go back to my deployed "Token" contract from Part 1 and find the **approve** function.

- **spender:** 0xaAAFEF2b87e27deD1fD8Ad9B6037CcAfD26C6024 ("Airdrop" contract address)
- **value:** 100000000000000000000 (maximum allowance to spend my tokens)

Then I clicked "Transact" to submit the approval.





Account 2



Запрос на ограничение расходов

Этот сайт хочет получить разрешение на вывод ваших токенов

Прогнозируемые изменения ?

Вы даете кому-то разрешение на трату этой суммы с вашего счета.

Лимит расходования

1 000 0x99415...Ca031

Расходующее лицо ?

0xaAAFE...C6024

Сеть

в BNB Smart Chain Testnet

Запрос от ?

remix.ethereum.org

Комиссия сети ?

< 0,01 \$ tBNB

Скорость

Рынок ~1 сек.

Отмена

Подтвердить

Dec 11, 2025



Одобрить лимит расходов в размере ADN

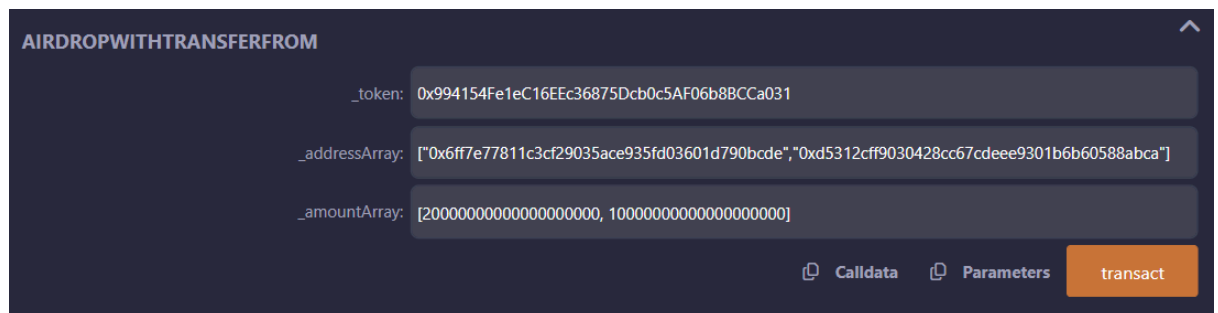
Подтверждено

[block:77780829 txIndex:0] from: 0x6ff...0BcdE to: Token.approve(address,uint256) 0x994...Ca031 value: 0 wei data: 0x095...00000 logs: 1 hash: 0x4b0...f2dbf

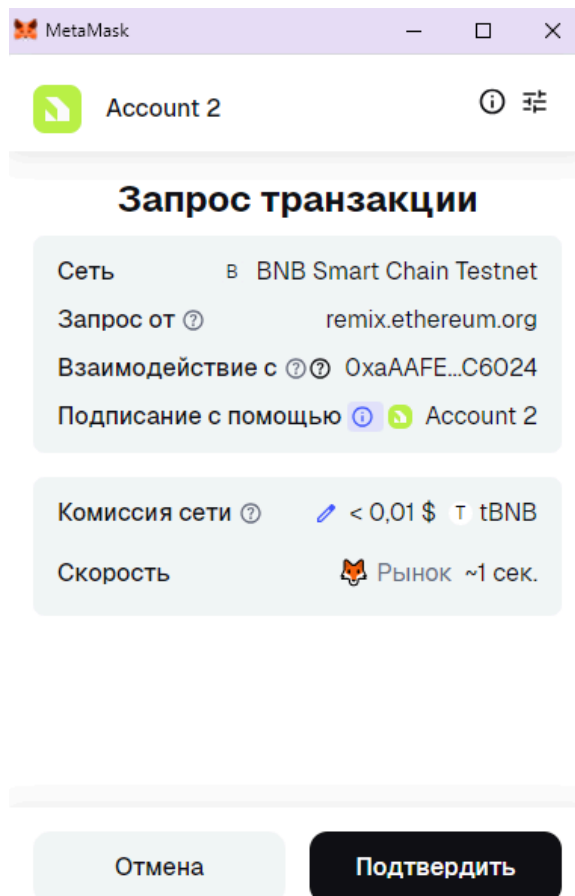
<https://testnet.bscscan.com/tx/0xaa0e02f9bcb0858f9cba0a2c9687f505ccd595596389704ddf6f72236fe4f1f4>

3. To execute the "Airdrop" contract , I go to the "Airdrop" contract and use the **airdropWithTransferFrom** function.
- **_token:** 0x994154Fe1eC16EEc36875Dcb0c5AF06b8BCCa031 ("Token" Address)
 - **_addressArray:** ["0x6ff7e77811c3cf29035ace935fd03601d790bcde", "0xd5312cff9030428cc67cdeee9301b6b60588abca"] → my MetaMask wallet addresses
 - **_amountArray:** [2000000000000000000, 1000000000000000000] → (20 and 10 tokens)

Then I clicked "Transact".



The screenshot shows a dark-themed interface for the **AIRDROPWITHTRANSFERFROM** function. It contains three input fields: **_token:** 0x994154Fe1eC16EEc36875Dcb0c5AF06b8BCCa031, **_addressArray:** ["0x6ff7e77811c3cf29035ace935fd03601d790bcde", "0xd5312cff9030428cc67cdeee9301b6b60588abca"], and **_amountArray:** [2000000000000000000, 1000000000000000000]. At the bottom right, there are buttons for "Calldata", "Parameters", and a prominent orange "transact" button.



The screenshot shows the MetaMask transaction confirmation screen. At the top, it says "MetaMask" and "Account 2". The main heading is "Запрос транзакции". Below it, the details are: "Сеть" (Network) is BNB Smart Chain Testnet, "Запрос от" (Request from) is remix.ethereum.org, "Взаимодействие с" (Interaction with) is 0xaAAFE...C6024, and "Подписание с помощью" (Signing with) is Account 2. The "Комиссия сети" (Network fee) is < 0,01 \$ in tBNB. The "Скорость" (Speed) is Рынок ~1 сек. At the bottom, there are two buttons: "Отмена" (Cancel) and "Подтвердить" (Confirm).

Dec 11, 2025



Взаимодействие по контракту

Подтверждено

-0 TBNB

-0 TBNB

<https://testnet.bscscan.com/tx/0x91dba155f2c3a104fea414369132c3c45a3b7ee88fe9b4a862d20899f93e1a0e>

My token (ADN) balance went down from 100 ADN to 90 ADN (-10 token)



ADN

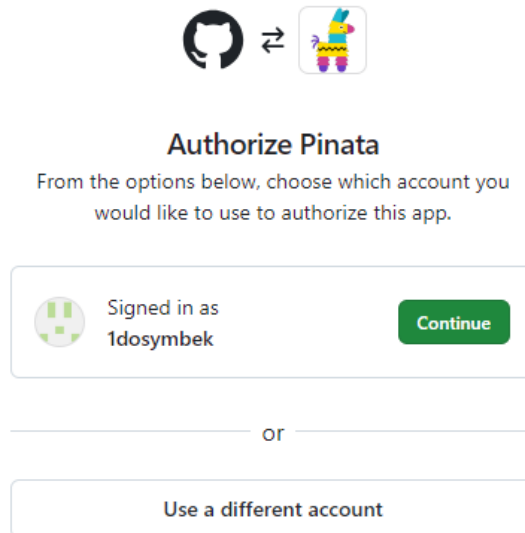
Нет доступного обменного курса

90 ADN

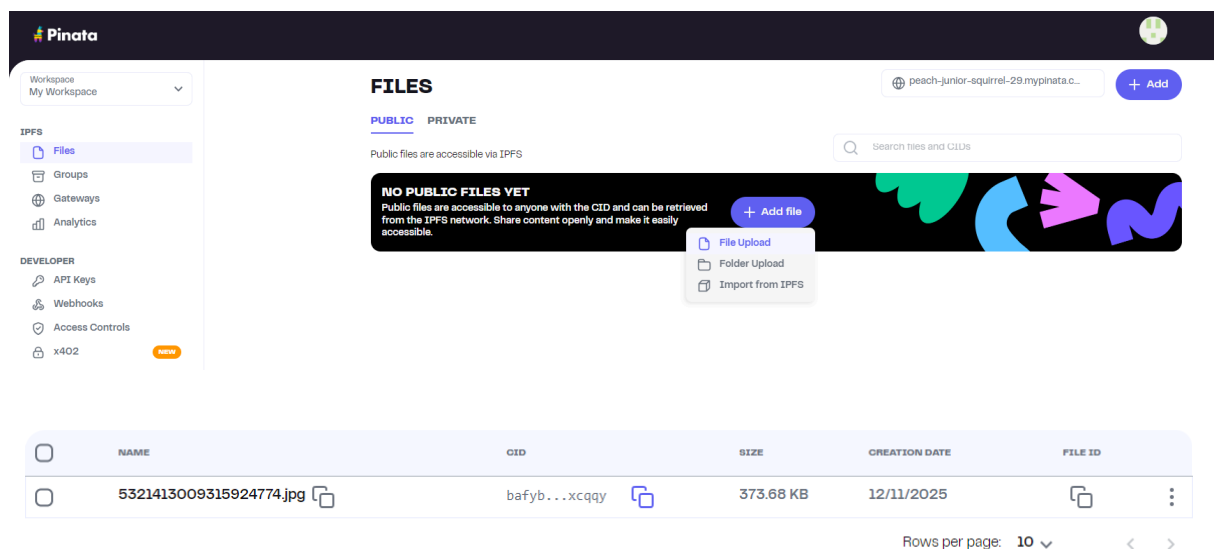
Part 3: NFT Collection with Metadata (ERC721 + IPFS)

Step A: Preparing IPFS Metadata (Crucial Step)

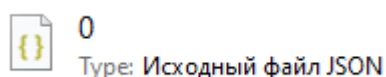
1. Pinata registration via GitHub.



2. I clicked "Add file", picked a JPEG image, and uploaded it.




3. CID: **bafybeic3nscabf566bmhku7vllnnxrhxgdc3pd6xfykvfddl2bc7xcqqy**
4. I created a file called "0.json" and pasted the code into it and added the image CID I copied from Pinata.





```
assignment 11 > metadata > 0.json > ...
1 {
2   "name": "Aidana NFT #0",
3   "description": "My first practical NFT work",
4   "image": "ipfs://bafybeic3nscabf566bmhku7vllnnxrhxgdc3pd6xfykvfdd12bc7xcqqy"
5 }
```


5. I put "0.json" into a folder named "metadata".

 metadata

hain labs > assignment 11 > metadata

Name	Date modified	Type	Size
 0	12/11/2025 5:49 AM	Исходный файл J...	1 KB

6. Next, I uploaded "metadata" to Pinata and copied its CID.

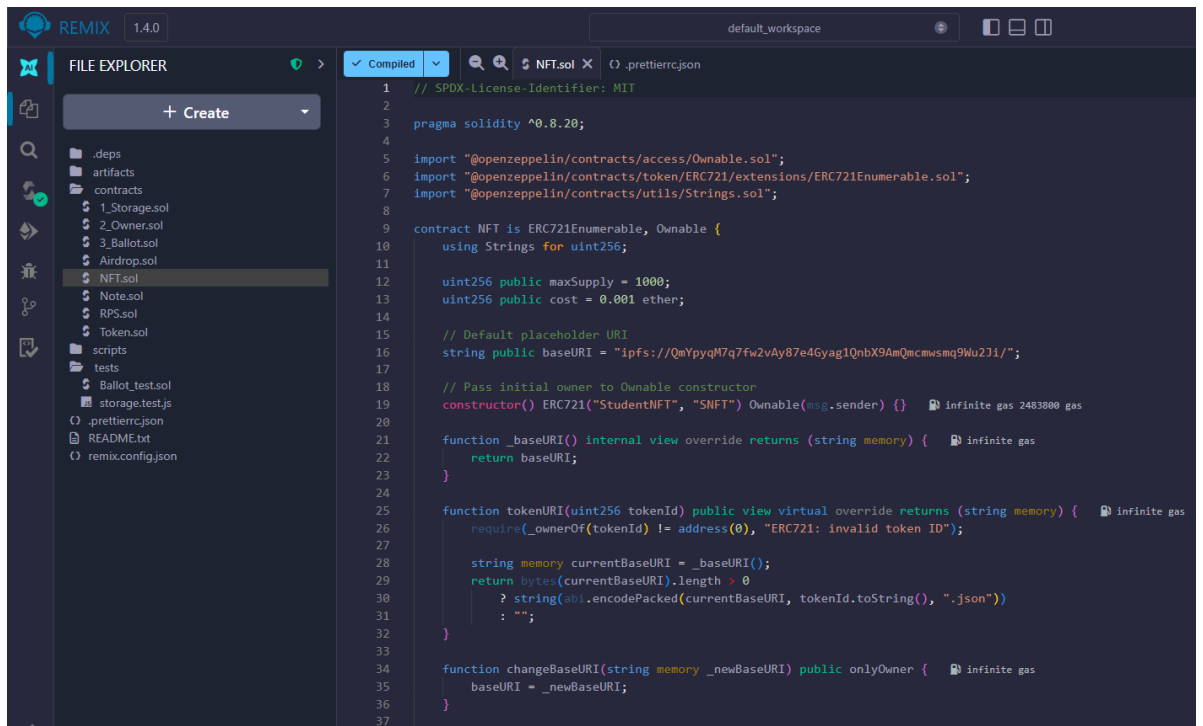
<input type="checkbox"/>	NAME	CID	SIZE	CREATION DATE	FILE ID
<input type="checkbox"/>	 metadata 	bafyb...fsura 	223 B	12/11/2025	 ⋮
<input type="checkbox"/>	 5321413009315924774.jpg 	bafyb...xcqqy 	373.68 KB	12/11/2025	 ⋮

Rows per page: 10 < >

CID: **bafybeigffjj3t5fpq6unnb55f4f3n7zmslpfocmob3jeesebbqyanfsura**

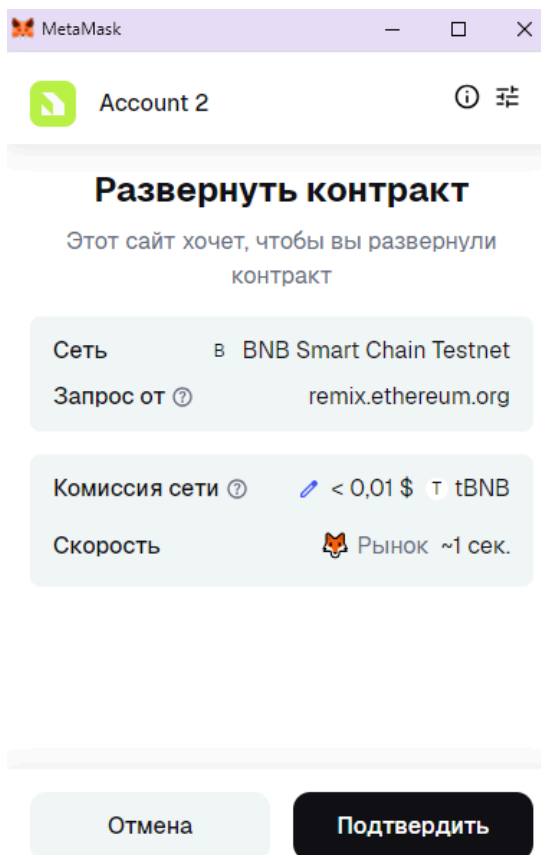
Step B: Smart Contract Deployment

1. I created "NFT.sol", pasted the provided code into it, compiled and deployed it, and also confirmed it in MetaMask.



The screenshot shows the Remix IDE interface. On the left is the File Explorer with a project structure including folders like .deps, artifacts, contracts, and scripts, and files like 1.Storage.sol, 2.Owner.sol, 3.Ballot.sol, Airdrop.sol, NFT.sol, Note.sol, RPS.sol, Token.sol, scripts, tests, Ballot_test.sol, storage.test.js, .prettierrc.json, README.txt, and remix.config.json. The main editor displays the code for NFT.sol, which is a Solidity smart contract. The code includes imports for OpenZeppelin contracts, a constructor, and functions for tokenURI, _baseURI, and changeBaseURI. The contract is named NFT and inherits from ERC721Enumerable and Ownable.

```
1 // SPDX-License-Identifier: MIT
2
3 pragma solidity ^0.8.20;
4
5 import "@openzeppelin/contracts/access/Ownable.sol";
6 import "@openzeppelin/contracts/token/ERC721/extensions/ERC721Enumerable.sol";
7 import "@openzeppelin/contracts/utils/Strings.sol";
8
9 contract NFT is ERC721Enumerable, Ownable {
10     using Strings for uint256;
11
12     uint256 public maxSupply = 1000;
13     uint256 public cost = 0.001 ether;
14
15     // Default placeholder URI
16     string public baseURI = "ipfs://QmYpyqM7q7fw2vAy87e4Gyag1QnbX9AmQmcmsmq9Wu2Ji/";
17
18     // Pass initial owner to Ownable constructor
19     constructor() ERC721("StudentNFT", "SNFT") Ownable(msg.sender) {} // infinite gas 2483800 gas
20
21     function _baseURI() internal view override returns (string memory) { // infinite gas
22         return baseURI;
23     }
24
25     function tokenURI(uint256 tokenId) public view virtual override returns (string memory) { // infinite gas
26         require(_ownerOf(tokenId) != address(0), "ERC721: invalid token ID");
27
28         string memory currentBaseURI = _baseURI();
29         return bytes(currentBaseURI).length > 0
30             ? string(abi.encodePacked(currentBaseURI, tokenId.toString(), ".json"))
31             : "";
32     }
33
34     function changeBaseURI(string memory _newBaseURI) public onlyOwner { // infinite gas
35         baseURI = _newBaseURI;
36     }
37 }
```



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Развертывание контракта
Подтверждено

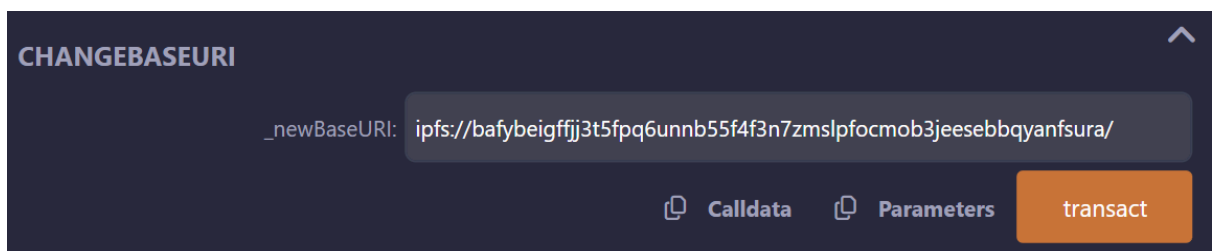
-0 TBNB
-0 TBNB

<https://testnet.bscscan.com/tx/0x6e6569aa7bbe236f4ff135714e76d802cc03f9b466c6a8f87b025ca624669cd4>

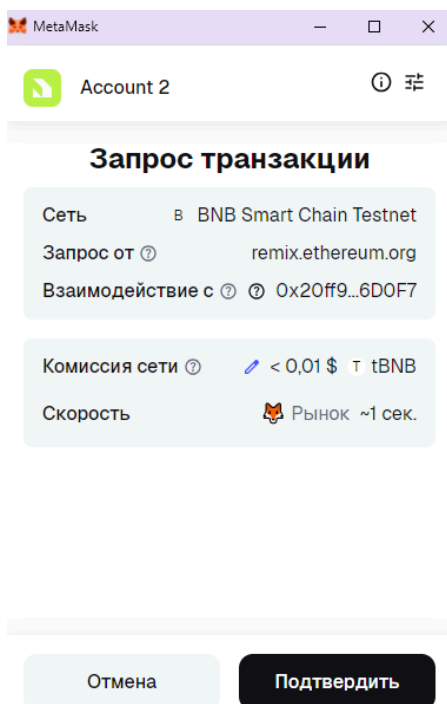
NFT Contact Address: 0x20ff997ce78ab748588EFbC51255C9525496D0F7

Step C: Linking and Minting

1. **changeBaseURI** function →
ipfs://bafybeigffjj3t5fpq6unnb55f4f3n7zmslpfocmob3jeesebbqyanfsura/



Then, I clicked "Transact" and confirmed it in MetaMask.



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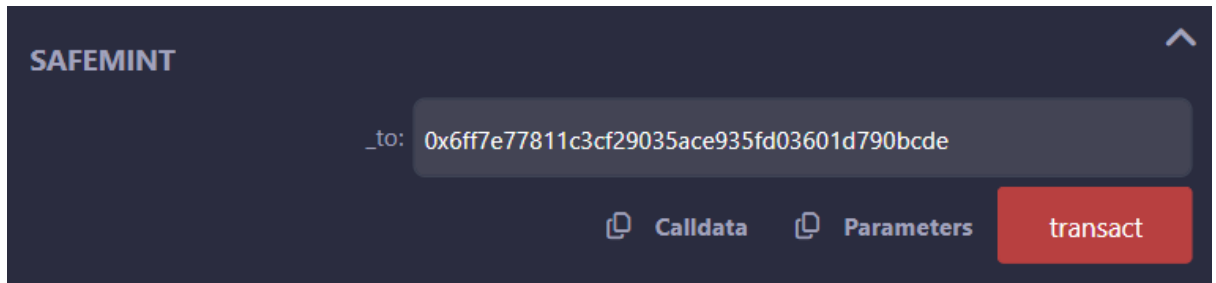


Взаимодействие по контракту
Подтверждено

-0 TBNB
-0 TBNB

<https://testnet.bscscan.com/tx/0xe688b79c859409517c5896aa5db7526d9af66fa0c7bdbefd831cd1f8ea946cc1>

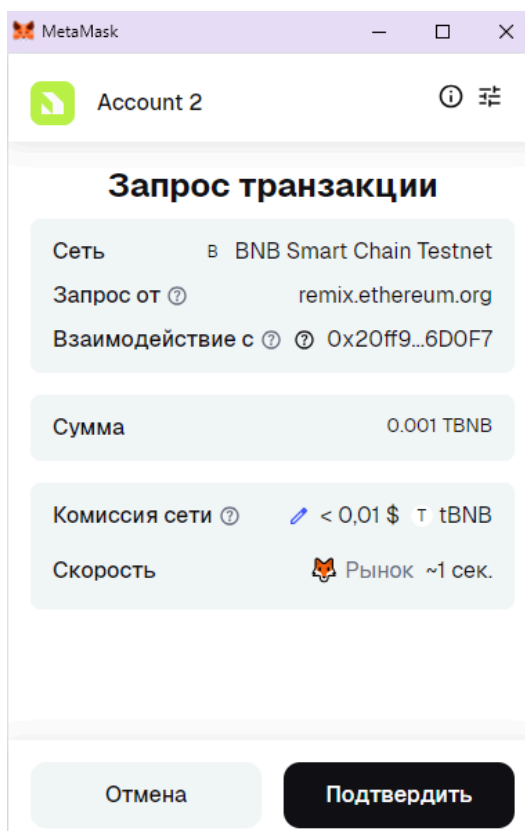
2. **safeMint** function → 0x6ff7e77811c3cf29035ace935fd03601d790bcde
(MetaMask Account Address)



the "value" field → 1000000 Gwei = 0.001 Ether → "Transact".



I confirmed the transaction request in MetaMask.



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Взаимодействие по контракту
Подтверждено

-0.001 TBNB

-0.001 TBNB

<https://testnet.bscscan.com/tx/0x97b0991775502db8b2acf579f30be44024b169c5a46769c186fe863066a81342>

3. **tokenURI** function with "ID 0" returned:

TOKENURI

tokenId: "0"

Calldata Parameters call

string:

ipfs://bafybeigffjj3t5fpq6unnb55f4f3n7zmslpfocmob3jeesebbqyanfsura/0.json

TOKENURI

tokenId: "0"

Calldata Parameters call

0: string: ipfs://bafybeigffjj3t5fpq6unnb55f4f3n7zmslpfocmob3jeesebbqyanfsura/0.json

<https://gateway.pinata.cloud/ipfs/bafybeigffjj3t5fpq6unnb55f4f3n7zmslpfocmob3jeesebbqyanfsura/0.json>

NFT displaying in MetaMask:

Account 2 ▾



0,00 \$

+0,00 \$ (+0,00 %)



Купить



Обмен...



Отправ...



Получи...

Токены DeFi **NFT** Деятельность

BNB Smart Chain Testnet ▾



Aidana NFT #0



Aidana NFT #0



Aidana NFT #0

My first practical NFT work

Адрес контракта

0x20ff9...6D0F7 

ID токена

0

Стандарт токена

ERC721

Отказ от ответственности: MetaMask извлекает медиафайл из исходного URL. Этот URL иногда изменяется торговой площадкой, на которой был выполнен минтинг NFT.