

# “Hello World” smart contract

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## solidity code

```
// SPDX-License-Identifier: GPL-3.0
pragma solidity >=0.7.0 <0.9.0;

contract HelloWorld {
    uint256 private 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;
    }
}
```

## screenshot

The screenshot displays the Remix IDE interface. On the left, the 'DEPLOY & RUN TRANSACTIONS' sidebar is visible, showing the environment set to 'JavaScript VM (London)', the account '0x5B3...eddC4 (99.99999999)', and the gas limit '3000000'. The contract 'HelloWorld - contracts/1\_Storage.sol' is selected. The 'Deploy' button is highlighted. Below, the 'Deployed Contracts' section shows the 'store' function with a value of '1000000000000' and the 'retrieve' function. The 'Low level interactions' section shows a 'Transact' button.

The main editor shows the Solidity code for the 'HelloWorld' contract:

```

1 // SPDX-License-Identifier: GPL-3.0
2 pragma solidity >=0.7.0 <0.9.0;
3
4 contract HelloWorld {
5     uint256 private number;
6
7     /**
8      * @dev Store value in variable
9      * @param num value to store
10     */
11     function store(uint256 num) public {
12         number = num;
13     }
14
15     /**
16      * @dev Return value
17      * @return value of 'number'
18     */
19     function retrieve() public view returns (uint256) {
20         return number;
21     }
22 }
23

```

The bottom panel shows the transaction details for the 'creation of HelloWorld pending...' transaction. The transaction is successful, with a status of 'true Transaction mined and execution succeed'. The transaction hash is '0x8f1a3a05aa840b358371e7466aedc9fc43a52e3245a64849c828349cec3d7110'. The transaction cost is '125677 gas'.

# Ballot

## solidity code

write a batch function(giveRightToVoters) for reducing the number of transactions in the "giveRightToVote" function.The code is as follows:

```

/**
 * @dev Give 'voters' the right to vote on this ballot. May only be called by
 * 'chairperson'.
 * @param _voters addresses of voters
 */
function giveRightToVoters(address[] memory _voters) external {
    require(
        msg.sender == chairperson,
        "Only chairperson can give right to vote."
    );
    for (uint256 i = 0; i < _voters.length; i++) {
        address voter = _voters[i];
        if (!voters[voter].voted && (voters[voter].weight == 0)) {
            voters[voter].weight = 1;
        }
    }
}

```

The full code is [here](#)

## gas cost

giveRightToVote:

The screenshot shows the Remix IDE interface. On the left, the contract 'Ballot - contracts/3\_Ballot.sol' is loaded. The 'Deploy' button is highlighted. The main editor shows the function definition for 'giveRightToVote'. The execution results on the right show the transaction details:

Field	Value
status	true Transaction mined and execution succeed
transaction hash	0xc2451b30be62e068229fe7e210c8dbf38dca767639eeebf9884a81fb5c1652d5
from	0x58380da701c568545dcfc803fc8875f56beddC4
to	Ballot.giveRightToVote(address) 0x907f74d0c41e726ec95884e0e97fa6129e3b5E99
gas	80000000 gas
transaction cost	48657 gas
execution cost	48657 gas
hash	0xc2451b30be62e068229fe7e210c8dbf38dca767639eeebf9884a81fb5c1652d5
input	0x9e7...8a8b4
decoded input	{ "address_voter": "0x10379EC68C32563Ee2321Ed23a96e4FDC8a8B4" }
decoded output	{}
logs	[]
val	0 wei

the gas cost of giving 1 voter the right to vote is 48657. So the gas cost of giving 10 voters the right to vote is 486570.

giveRightToVoters:

The screenshot shows the Remix IDE interface. On the left, the contract 'Ballot - contracts/3\_Ballot.sol' is loaded. The 'Deploy' button is highlighted. The main editor shows the function definition for 'giveRightToVoters'. The execution results on the right show the transaction details:

Field	Value
status	true Transaction mined and execution succeed
transaction hash	0x4f1abe2c6ad262665d2ad76c635ce353ae0efc538c4da60a4cf24f606a69e9c
from	0x58380da701c568545dcfc803fc8875f56beddC4
to	Ballot.giveRightToVoters(address[]) 0xc06a2782d23807c13A74ddec5d140e554990f9
gas	80000000 gas
transaction cost	279412 gas
execution cost	279412 gas
hash	0x4f1abe2c6ad262665d2ad76c635ce353ae0efc538c4da60a4cf24f606a69e9c
Input	0xa1c...05c03
decoded input	{ "address[] _voters": [ "0xcF664887a5b00237a8BA6d742852ec6c8d69A27a", "0x59f8c108fCf3C801d8e29457A13561765C41", "0x1c0423AdbfCf089567C38P7D9488973342", "0x0ceae6Cc94A868008a8Ac1c8886faC4d598", "0x8058c54657cd753Ee336f7e07c857567784C048", "0x72c18C5bFA524207E680827E366b6990848", "0xf81556A7277a0b0122a0854F0a0b703911E1cB", "0xe2110f9856330A8c50e8a2E409C728590451b", "0x725553bc9A0939362671407fDEb1620D37D168", "0x995a035a351FF3679A9baA56cded78970285C83" ] }

the gas cost of giving 10 voters the right to vote is 279412.