Solidity Assignment

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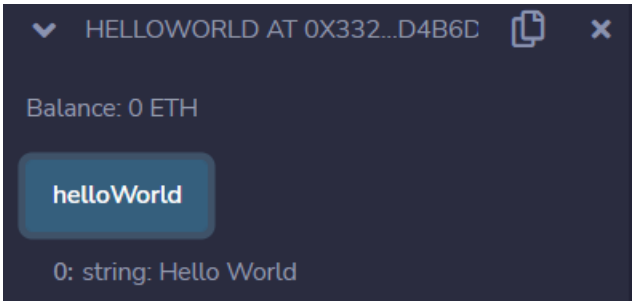
1)Hello World using solidity:

```
// SPDX-License-Identifier: MIT
pragma solidity 0.8.7;
contract HelloWorld {
   function helloWorld() public pure returns (string memory) {
      return "Hello World";
   }
}
```

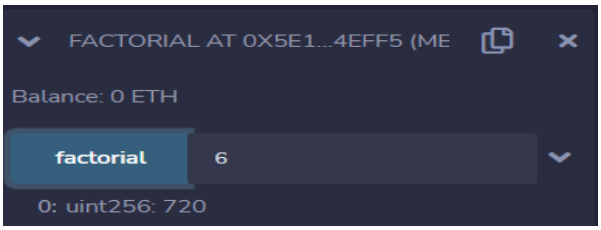
OUTPUT:



2)Program to find Factorial of number via pure functions:

```
// SPDX-License-Identifier: MIT
pragma solidity 0.8.7;
contract Factorial {

   function factorial(uint num) public pure returns (uint) {
       //num = number of which factorial is calculated
      uint fact=1;
      for(uint i=1; i<=num; i++)  //factorial logic: Ex: 5!=5*4*3*2*1 thus i = 1 will be
incremented upto 5
      {
      fact=fact*i;
      }
      return fact;
   }
}
```

OUTPUT:

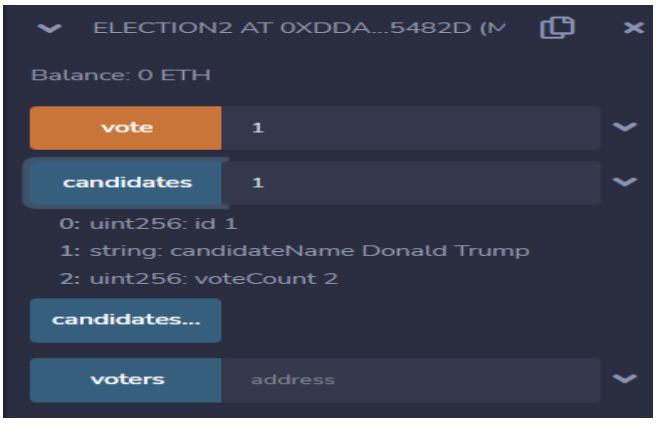


3)Implementing decentralised voting system for 3 candidates, each voter can vote twice

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.7;

contract Election2 {
//defining structure with mutliple candidate variables
struct Candidate{

   uint id;
   string candidateName;
   uint voteCount;

}
//Giving references using mapping
mapping (address=>uint) public voters;

//0 , 1 =
mapping (uint=> Candidate)public candidates;

uint public candidatesCount;

function addCandidate(string memory _name) private {

   candidatesCount++;

   candidates[candidatesCount]=Candidate(candidatesCount,_name,0);

}

constructor() {

   addCandidate("Donald Trump");   //adding 3 candidates
   addCandidate("Joe Baiden");
   addCandidate("Kamala Harris");

}
```

```
event consolePrint( string, address);

function vote(uint _candidateId) public{

  // Voter can vote twice :
   require(voters[msg.sender] <2); //msg.sender => person who has initiated smart contract

   require(_candidateId>0 && _candidateId<=candidatesCount); //correct set of candidates

   emit consolePrint("value of sender is ",msg.sender);

   voters[msg.sender] += 1;

   candidates[_candidateId].voteCount++;

}

}
```

OUTPUT:



4)Palindrome Program : to write a code to return palindrome of a string, if it is palindrome transfer 50 ETH from one account to manager account.

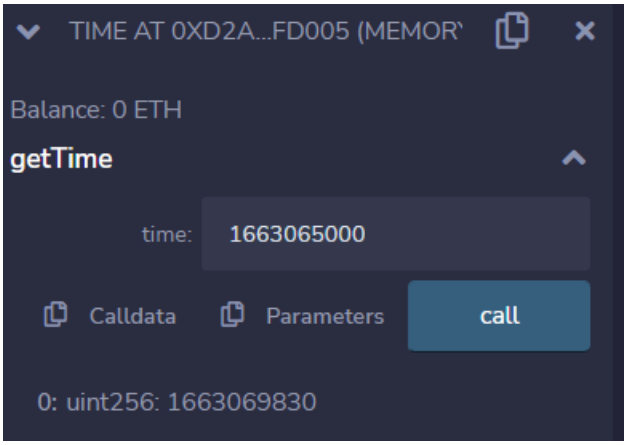
5)Write a contract 'Time' which implements a function named getTime:

For current Epoch & Unix timestamp used : https://www.epochconverter.com/

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.7;
```

```
contract Time{
   function getTime(uint time) public view returns(uint){
      //checking entered time exists after current time
      if(time>block.timestamp){
         return time+4830;  //1 hour, 20 minutes and 30 seconds = 3600 + 1200 + 20 seconds =
4830
      }
      else {
         return 0;
      }
   }
}
```

OUTPUT:



6)Problem Statement

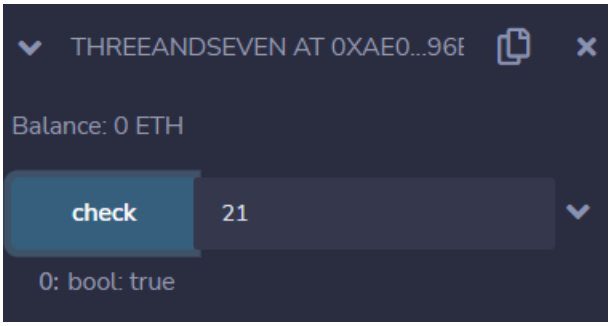
Write a contract 'ThreeAndSeven' which implements a function named check.

check() accepts a number and return true if number is fully divided by 3 or 7 and greater than 10 else false. This function should not consume any gas.

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.7;
contract ThreeAndSeven{
   function check(int num) public pure returns (bool){
  //checking i fnumber is divisible by 3 and 7
   if(num%3==0 && num%7==0)  //using '&&' and operator to fulfill both conditions
   {
      if(num>10){
         return true;
      }
      else {
```

```
        return false;
      }
    }

    }
}
```

OUTPUT:

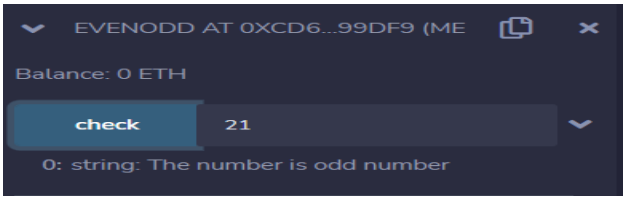


7)EvenOdd: Problem Statement

Write a contract 'EvenOdd' to which implements a function named check.check() accepts a number and return whether the passed number is odd or even without consuming gas. (Ignore various checks on passed parameters for now)

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.7;
contract EvenOdd{

    function check(int num) public pure returns(string memory) {

        if(num % 2==0){
            return "The number is even number";
        }
        else {
            return "The number is odd number";
        }
    }
}
```

OUTPUT:

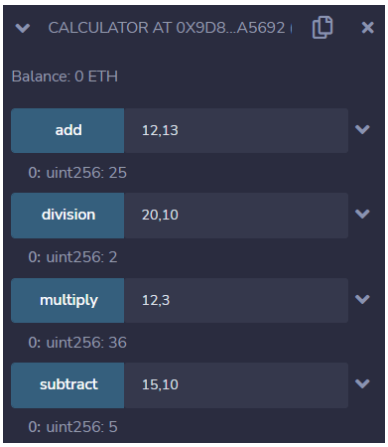


8)Problem Statement

Write a contract 'Calculator' to which returns addition, subtraction, multiplication and division of two passed integers without consuming gas. (Ignore various checks on passed parameters for now)

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.7;

contract Calculator{
 //addition
  function add(uint a, uint b) public pure returns (uint){
     return a+b;
  }
  //subtraction
  function subtract(uint a, uint b) public pure returns (uint){
     return a-b;
  }
   //multiplication
  function multiply(uint a, uint b) public pure returns (uint)
  {
     return a*b;
  }
   //division
  function division(uint a, uint b) public pure returns (uint){
     return a/b;

  }

}
```

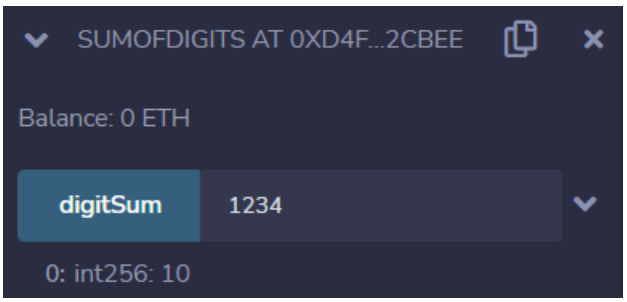
OUTPUT:



9)Program to find Sum of Digits:

```
// SPDX-License-Identifier: MIT
pragma solidity 0.8.7;
contract SumofDigits{
function digitSum(int n) public pure returns (int) {
      int a;
      int sum = 0;
      while (n > 0) {
         a = n % 10;    //ex: n = 135 135%10= 5, a=5 similar for all digits
         sum = sum + a;
         n = n / 10;
      }
      return sum;
   }

}
```

OUTPUT:

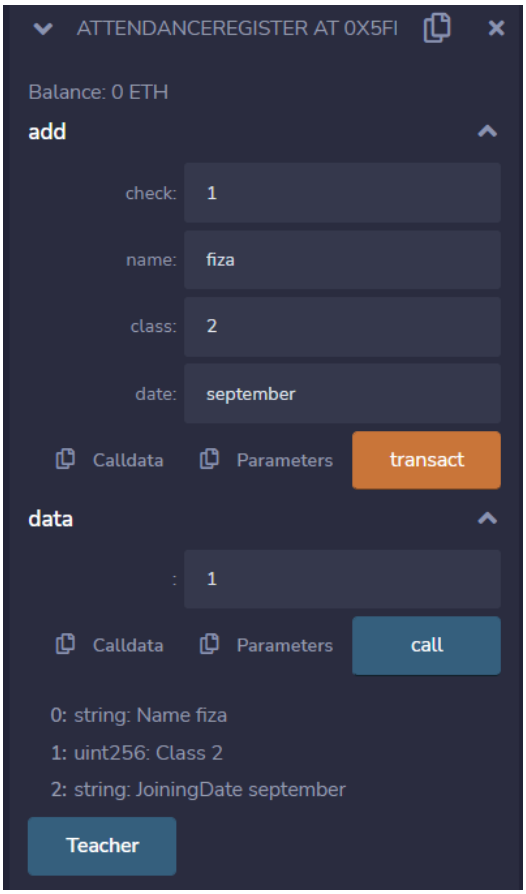


10)Problem Statement

Write a contract named "AttendanceRegister" which will be deployed by teacher. There will be a function add which will take student name, class & joiningDate and will store it where:

```
// SPDX-License-Identifier: MIT

pragma solidity ^0.8.7;

struct student{
      string Name;
      uint Class;
      string JoiningDate;
   }

contract AttendanceRegister{

   address public Teacher = msg.sender;
   mapping (uint => student) public data;
   event Register(address Teacher, student Data);

   modifier onlyTeacher() {
      require(Teacher == msg.sender, "You are not a teacher");
      _;
   }

   function add(uint check, string memory name, uint class, string memory date) public
onlyTeacher {

      data[check] = student(name,class,date);
      emit Register(msg.sender, data[check]);
   }
}
```

OUTPUT:


ATTENDANCEREGISTER AT 0X5FI
Balance: 0 ETH
add
check:
1
name:
fiza
class:
2
date:
september
Calldata
Parameters
transact
data
:
1
Calldata
Parameters
call
0: string: Name fiza
1: uint256: Class 2
2: string: JoiningDate september
Teacher