PRACTICAL 6

[CS601] – Cryptography and Blockchain

Date – 06/02/2023 | *By* Aishwarya Suryakant Waghmare, PRN – 2001106059

Title/Aim of the practical :

To write a program to create following contracts in solidity:

Looping Practice

// Create a contract myLoopingPracticeContract and place all the following code within:

// Create a list that ranges from 1 to 20 called longList

// Create a list called numbersList of the following numbers: 1, 4, 34, 56

// Create a function that loops through numbersList and returns a true value if the number that the user inputs exist in the list otherwise it should return false.

// Create a function that loops through and returns how many even numbers there are in the long list

Enum

// Create an enum for the color of shirts called shirtColor and set it to the options of either RED or WHITE or BLUE

// Create a data of shirtColor called defaultChoice which is a constant set to the color BLUE

// Create a data of shirtColor called choice and don't initiate the value

// Create a function called setWhite which changes the shirt color of shirtColor to white

// Create a function getChoice which returns the current choice of shirtColor

// Create a function getDefaultChoice which returns the default choice of shirtColor

Structs

// Create a new movie and set it up so that it updates to the movie in the setMovie function

// Return the id of the new movie

// Create a new var called comedy and set up comedy to the datatype Movie

// Update the setMovie function with a comedy movie that contain name, director, and an id

// Return the movie id of the comedy.

Exercises with Strings

// Create a string called favoriteColor

// Set the favorite color of the string favoriteColor to blue

// Create a function which returns the string literal of favoriteColor

// Create a function which changes the favoriteColor string literal from blue to your favorite color.

// Create a function which can return how many characters there are in the string favorite color

Apparatus/Tools/ Resources used :

- Lecture Notes
- E-Resources
- E-Book
- Laptop

Procedure of the practical :

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Exercises with Strings

// Create a string called favoriteColor

// Set the favorite color of the string favoriteColor to blue

// Create a function which returns the string literal of favoriteColor

// Create a function which changes the favoriteColor string literal from blue to your favourite color.

// Create a function which can return how many characters there are in the string favourite color

Program Code :

Looping Practice

```
pragma solidity ^0.5.0;

contract myLoopingContract {
   uint [] longlist = [1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20];
   uint [] numbersList = [1,4,34,56];

   function checkMultiples1(uint number) public view returns (uint){
      uint count=0;

      for(uint i=1; i< numbersList.length; i++){
         if(checkMultipleValidity1(numbersList[i], number)) {
            count++;
         }
      }
      return count;
   }

   function checkMultipleValidity1(uint num, uint nums) public view returns (bool){
      if(num % nums == 0){
         return true;
      } else{
         return false;
      }
   }

   function checkEven(uint number) public view returns (uint){
      uint count=0;

      for(uint i=1; i< longlist.length; i++){
         if(checkMultipleValidity1(longlist[i], 2)) {
            count++;
         }}
      return count;
   }
}
```

Enum

```
pragma solidity ^0.5.0;

contract learnenum {
  enum shirtcolor{ RED, WHITE, BLUE }
  shirtcolor choice;
  shirtcolor constant defaultChoice = shirtcolor.BLUE;

  function setWHITE() public {
    choice = shirtcolor.WHITE;
  }
  function getChoice() public view returns (shirtcolor) {
    return choice;
  }
  function getDefaultChoice() public pure returns (uint) {
    return uint(defaultChoice);
  }
}
```

Structs

```
pragma solidity ^0.5.0;
contract learnstructs {
   struct Movie {
      string title;
      string director;
      uint movie_id;
   }
   Movie Comedy;

   function setMovie() public {
      Comedy = Movie('Cirkus', 'Robert', 1);
   }
   function getMovie() public view returns(uint){
      return Comedy.movie_id;
   }
}
```

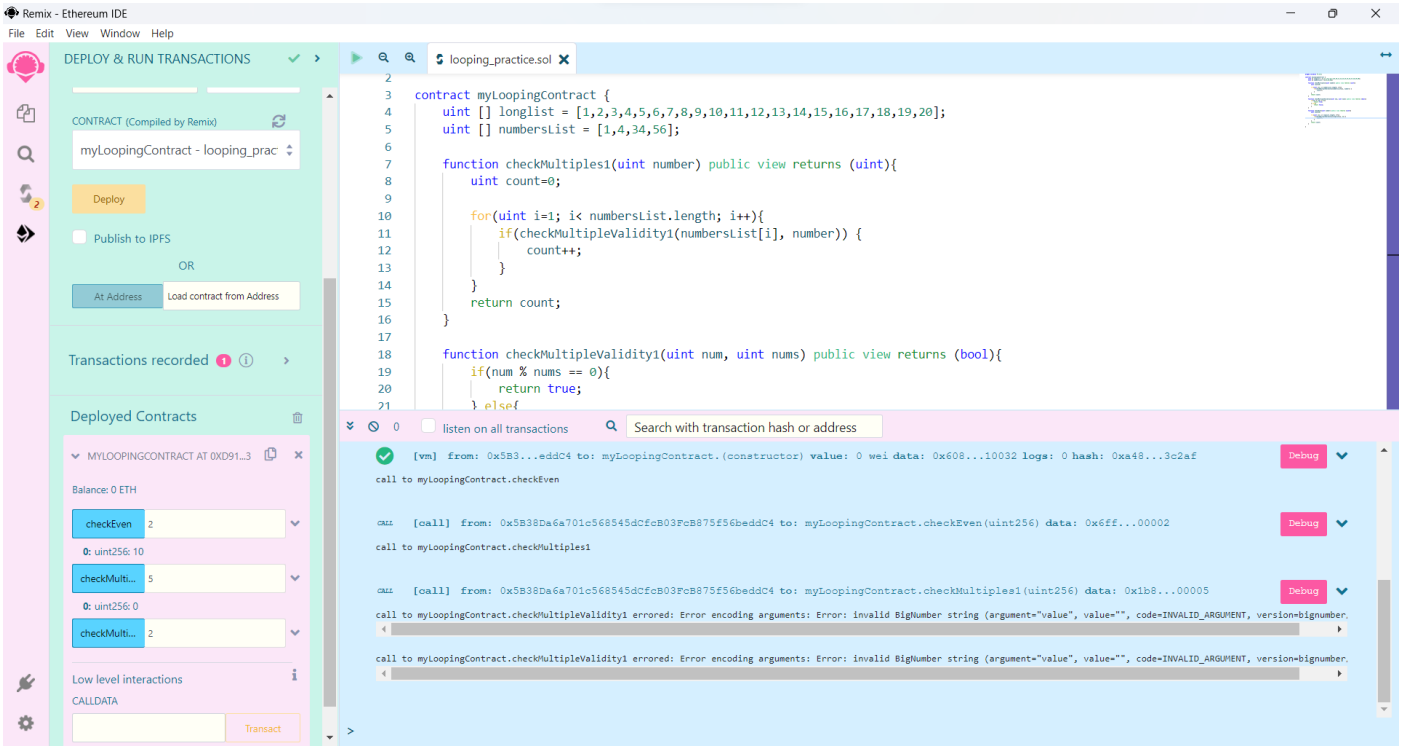
String Exercises

```
pragma solidity ^0.5.0;

contract learnstrings {

   // Hello is a string literal
   string greetings = 'hello!';

   function sayHello() public view returns (string memory){
      return greetings;
   }

   function changeGreetings(string memory change) public {
      greetings = change;
   }

   function getStringLength() public view returns(uint){
      bytes memory stringToBytes = bytes(greetings);
      return stringToBytes.length;
   }

   string favoriteColor = 'blue';

   function getColor() public view returns (string memory) {
      return favoriteColor;
   }

   function changeColor(string memory _color) public {
      favoriteColor = _color;
   }

   function getColorLength() public view returns(uint) {
      bytes memory colorToBytes = bytes(favoriteColor);
      return colorToBytes.length;
   }
```

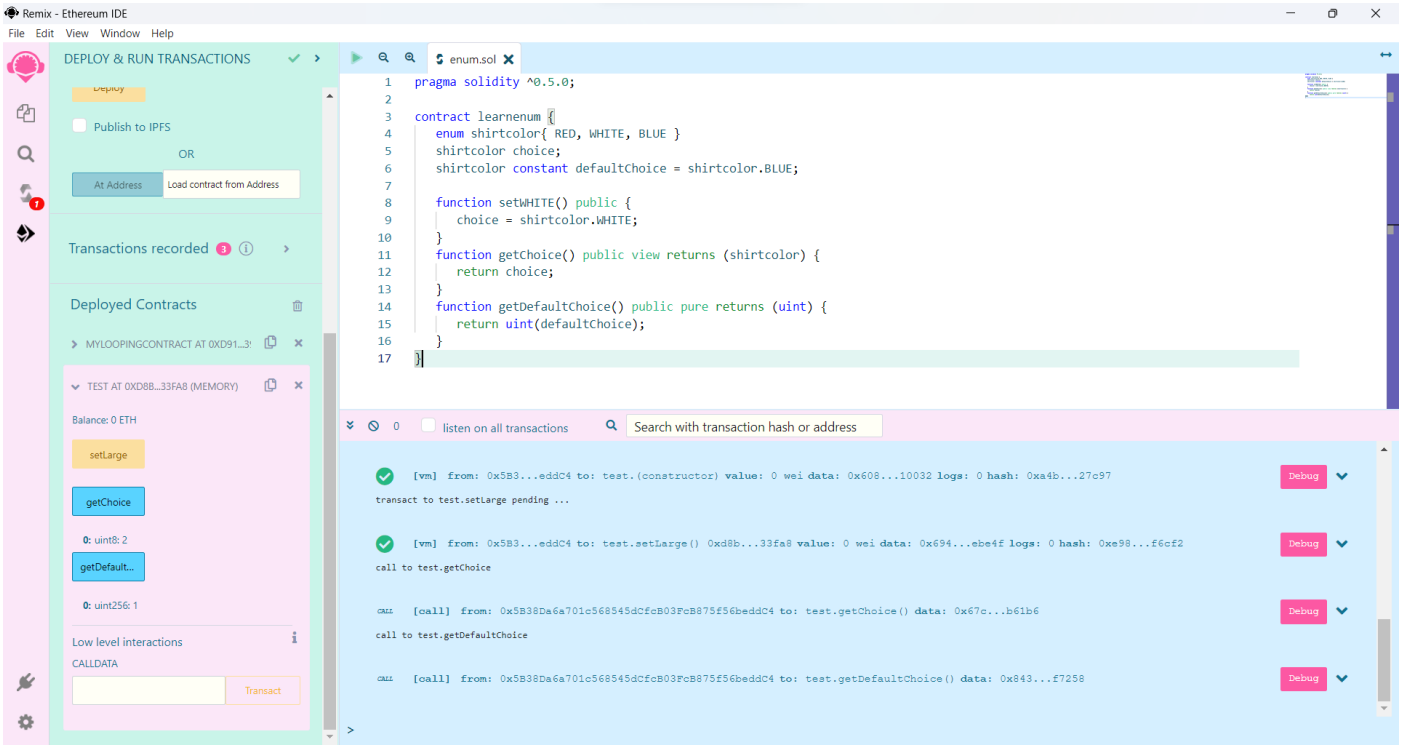
```
// A list of number ranging from 1 to 10
uint [] public numbersList = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10];

function checkMultiples(uint _number) public view returns (uint) {
    uint count = 0;
    for(uint i = 1; i < numbersList.length; i++){
        if(checkMultipleValidity(numbersList[i], _number)) {
            count++;
        }
    }
    return count;
}
function checkMultipleValidity(uint _num, uint _nums) public view returns (bool) {
    if(_num % _nums == 0){
        return true;
    } else {
        return false;
    }
}}
```

Result/ Output/ Screenshots of the Practical :

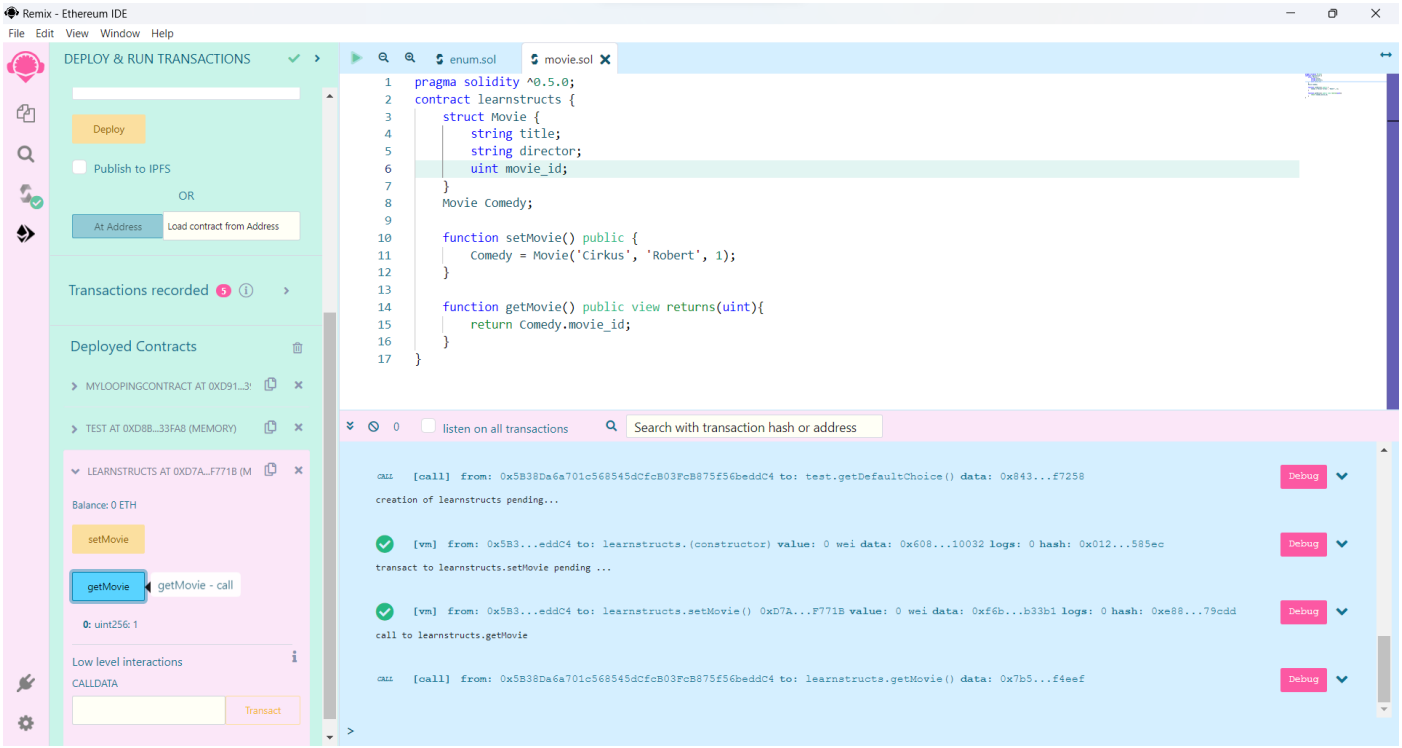
Looping Practice



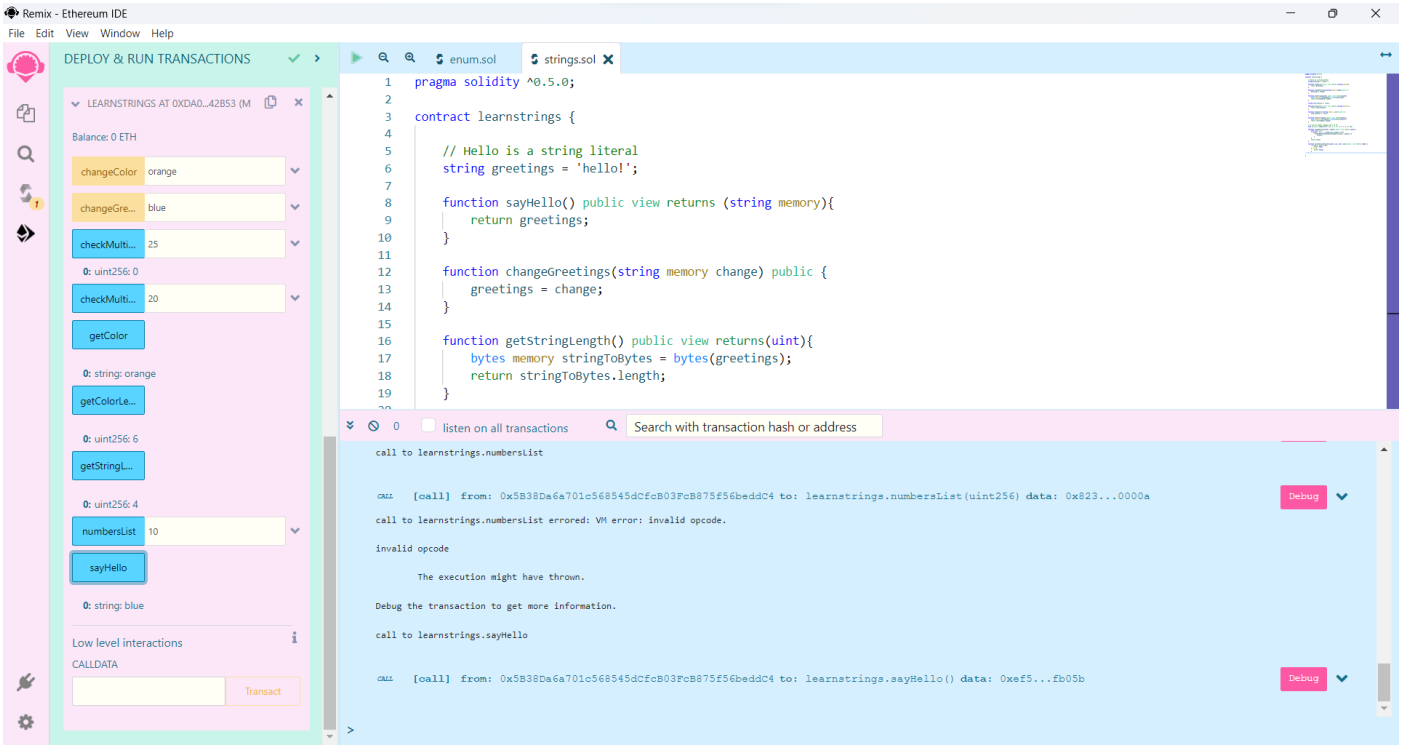
Enum



Structs



String Exercises



Parameters achieved/ Conclusion :

Therefore, understood and wrote program in the solidity as well as created the smart contracts for the looping practice, enum, strings and structs.