LAB EXAM

Concepts of Programming & Operating System

Total Marks: 10 Time: 1 hour

1. Write a program to read the elements into an array and print it. Remove the duplicate elements in the array and return the new length of the array and print the elements.

Array Class

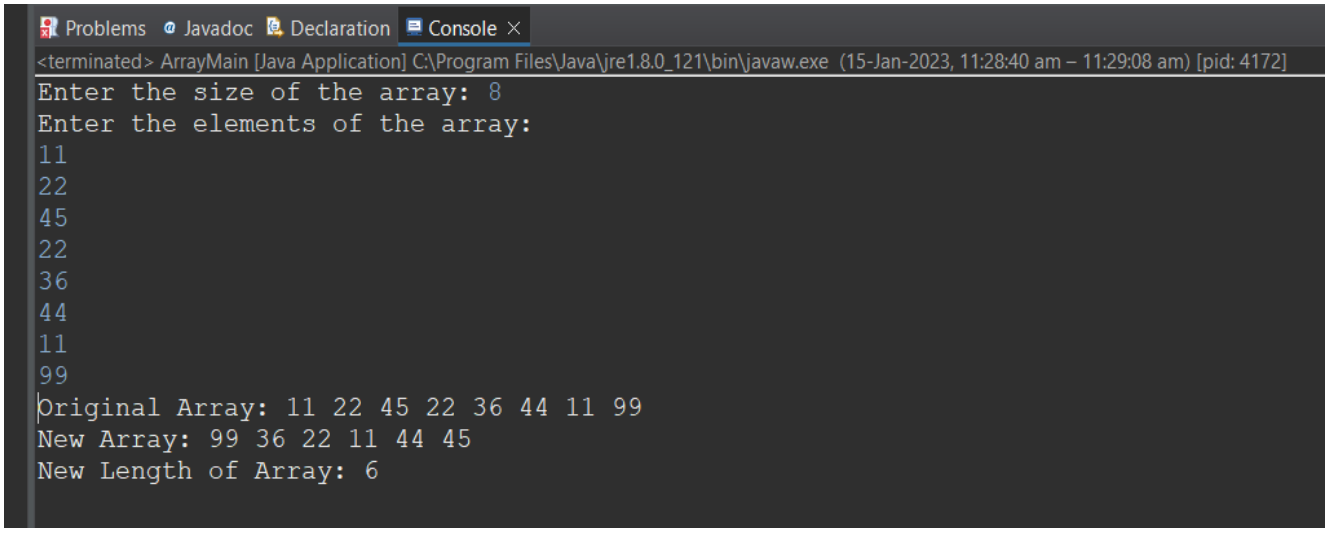
```
package com.arrayduplicate.entity;

import java.util.HashSet;
import java.util.Scanner;
import java.util.Set;

public class Array {
    private int[] arr;
    private int size;

    public Array(int size) {
        this.size = size;
        this.arr = new int[size];
    }

      public void readElements() {
            Scanner input = new Scanner(System.in);
            System.out.println("Enter the elements of the array: ");
            for (int i = 0; i < size; i++) {
                arr[i] = input.nextInt();
            }
        }
      public void printElements() {
            System.out.print("Original Array: ");
            for (int i = 0; i < size; i++) {
                System.out.print(arr[i] + " ");
            }
            System.out.println();
        }
      public int removeDuplicates() {
            Set<Integer> uniqueElements = new HashSet<Integer>();
```

```
            for (int i = 0; i < size; i++) {
                uniqueElements.add(arr[i]);
            }
            int index = 0;
            for (Integer element : uniqueElements) {
                arr[index++] = element;
            }

            System.out.print("New Array: ");
            for (int i = 0; i < index; i++) {
                System.out.print(arr[i] + " ");
            }
            System.out.println();
            return index;
        }
}
```

ArrayMain class

```
package com.arrayduplicate.main;

import java.util.Scanner;

import com.arrayduplicate.entity.Array;

public class ArrayMain {

    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter the size of the array: ");
        int size = input.nextInt();

        Array array = new Array(size);
        array.readElements();
        array.printElements();
        int newLength = array.removeDuplicates();
        System.out.println("New Length of Array: " + newLength);
    }
}
```

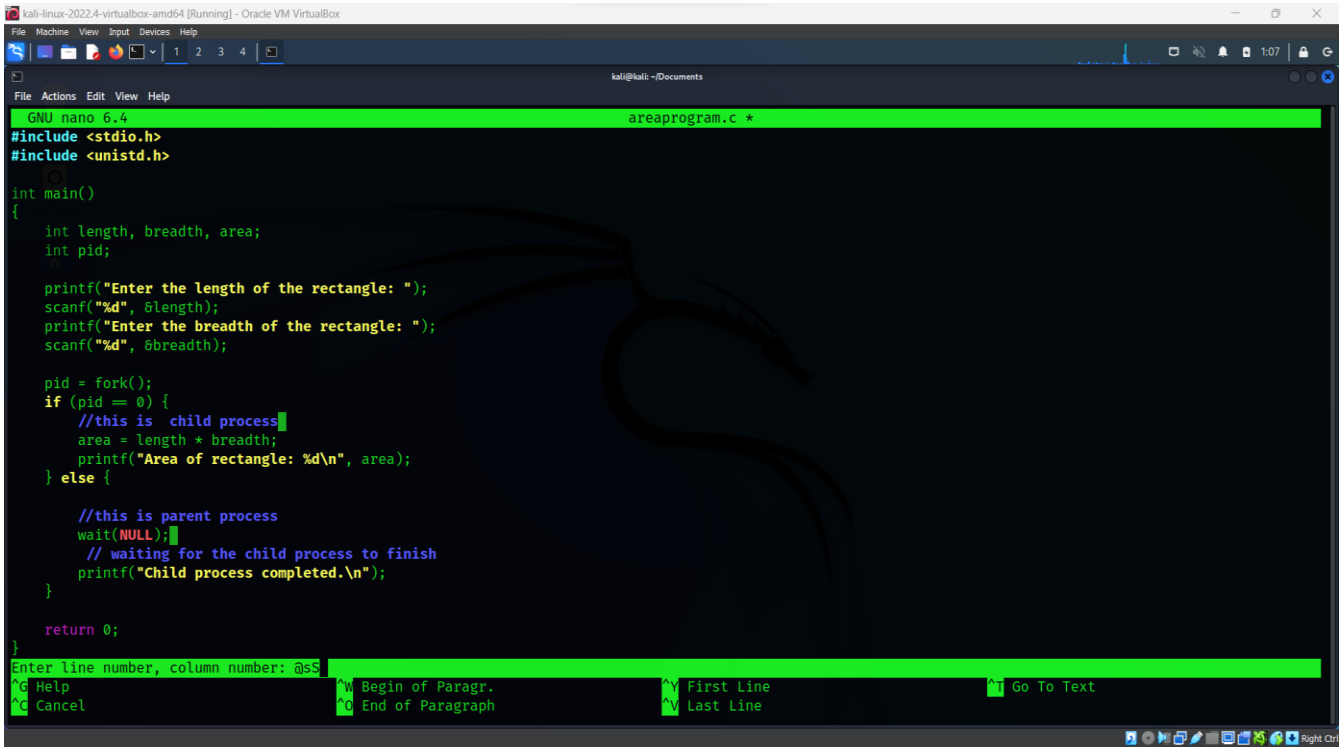
OUTPUT



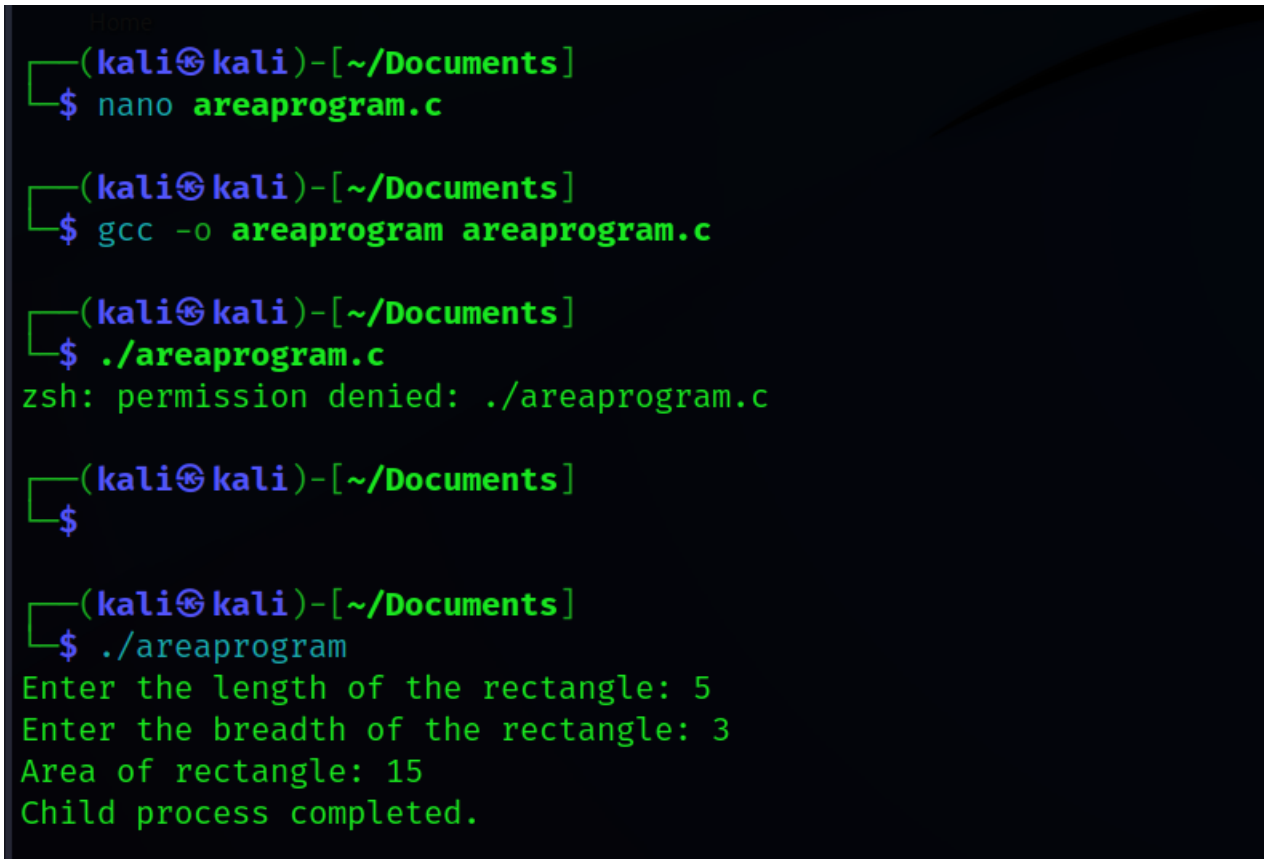
2. Write a C Program to create a child process which calculates the area of rectangle and parent process will prints the Area result after the child execution completed. Implement it using fork system call. Area = Length x Breadth.

```
#include <stdio.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>

int main()
{
    int length, breadth, area;
    int pid;

    printf("Enter the length of the rectangle: ");
    scanf("%d", &length);
    printf("Enter the breadth of the rectangle: ");
    scanf("%d", &breadth);

    pid = fork();
    if (pid == 0) {
        // Child process
```

```
        area = length * breadth;
        printf("Area of rectangle: %d\n", area);
    } else {
        // Parent process
        wait(NULL); // wait for the child process to finish
        printf("Child process completed.\n");
    }

    return 0;
}
```



OUTPUT


┌──(kali㉿kali)-[~/Documents]
└─$ nano areaprogram.c
┌──(kali㉿kali)-[~/Documents]
└─$ gcc -o areaprogram areaprogram.c
┌──(kali㉿kali)-[~/Documents]
└─$ ./areaprogram.c
zsh: permission denied: ./areaprogram.c
┌──(kali㉿kali)-[~/Documents]
└─$
┌──(kali㉿kali)-[~/Documents]
└─$ ./areaprogram
Enter the length of the rectangle: 5
Enter the breadth of the rectangle: 3
Area of rectangle: 15
Child process completed.

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