



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.

```

package com.oslab.entity;

import java.util.Scanner;

public class program {
    public static int removeDuplicates(int[] arr) {
        int newLength = arr.length;

        for (int i = 0; i < newLength; i++) {
            for (int j = i + 1; j < newLength; j++) {
                if (arr[i] == arr[j]) {
                    for (int k = j; k < newLength - 1; k++) {
                        arr[k] = arr[k + 1];
                    }
                    newLength--;
                    j--;
                }
            }
        }
        System.out.print("Unique elements: ");
        for (int i = 0; i < newLength; i++) {
            System.out.print(arr[i] + " ");
        }
        System.out.println();

        // Return the new length of the array
        return newLength;
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the number of elements in the array: ");
        int n = scanner.nextInt();
        int[] arr = new int[n];
        System.out.print("Enter the elements of the array: ");
        for (int i = 0; i < n; i++) {

```

PRN : 075

```
        arr[i] = scanner.nextInt();
    }

    System.out.print("Original array: ");
    for (int element : arr) {
        System.out.print(element + " ");
    }
    System.out.println();

    int newLength = removeDuplicates (arr);
    System.out.println("New length of the array: " +newLength);
}
}
```

Output:

```
Enter the number of elements in the array: 10
Enter the elements of the array: 1 1 2 3 3 4 5 6 6 7
Original array: 1 1 2 3 3 4 5 6 6 7
Unique elements: 1 2 3 4 5 6 7
New length of the array: 7
```

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 <sys/wait.h>
```

```
#include <sys/shm.h>
```

```
#include <unistd.h>
```

PRN : 075

```
int main() {  
  
    int l, b, area;  
  
    int shmid;  
  
    int *shmptr;  
  
    shmid = shmget(IPC_PRIVATE, sizeof(int), IPC_CREAT | 0666);  
  
    shmptr = shmat(shmid, NULL, 0);  
  
    int pid = fork();  
  
    if (pid == 0) {  
  
        printf("Enter the length of the rectangle: ");  
  
        scanf("%d", &l);  
  
        printf("Enter the breadth of the rectangle: ");  
  
        scanf("%d", &b);  
  
        area = l * b;  
  
        *shmptr = area;  
  
        shmdt(shmptr);  
  
    }  
  
    else {  
  
        wait(NULL);  
  
        printf("The area of the rectangle is: %d\n", *shmptr);  
  
        shmctl(shmid, IPC_RMID, NULL);  
  
    }  
  
    return 0;  
  
}
```

Output:

```
lab_exam$ gcc fork.c -o fork
lab_exam$ ./fork
Enter the length of the rectangle: 20
Enter the breadth of the rectangle: 30
The area of the rectangle is: 600
lab_exam$
```