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 copexam.demo;

import java.util.Scanner;

public class DuplicateMain {

	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++) {
            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);
}
}
```

```
<terminated> DuplicateMain [Java Application] C:\Users\Admin\Desktop\eclipse\plugins\org.eclip
Enter the number of elements in the array: 10
Enter the elements of the array: 1 1 2 2 3 4 5 6 7 8
Original array: 1 1 2 2 3 4 5 6 7 8
Unique elements: 1 2 3 4 5 6 7 8
New length of the array: 8
```

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>


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;
```

```
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$
```

}