Name: Khizar Ali

Roll No: 22P-9269

Subject: Programing Fundamentals LAB

Submitted to: Muhammad Usman

Problem 1:

```c
#include<stdio.h>
void secondMax(int *arr,int size){
    int max = *arr, secondMax = *arr;
    for(int i = 0; i < size; i++)
    {
        if(*arr > max){
            secondMax = max;
            max = *arr;
        }
        else if(*arr > secondMax){
            secondMax = *arr;
        }
        arr++;
    }
    printf("Second Max: %d\n", secondMax);
}
int main()
{
    int size = 10;
    int arr[10];
    printf("Enter 10  numbers: \n");
    for(int i = 0; i < size; i++)
    {
        scanf("%d", arr+i);
    }
    secondMax(arr, size);
    return 0;
}
```

Output:

```
PS C:\Users\p22-9269\Desktop\Khizar\Pf lab\EX 10> gcc 1.c
PS C:\Users\p22-9269\Desktop\Khizar\Pf lab\EX 10> ./a.exe
Enter 10  numbers:
1
2
3
4
5
6
7
8
9
10
Second Max: 9
```

Problem 2:

```c
#include <stdio.h>
int findMode(int *arr, int size)
{
    int max = 0,temp=0;
  int mode;

    for (int i = 0; i < size; i++)
    {
        int count = 0 ;

        for (int j = 0; j < size; j++)
        {
            if (*(arr+i) == *(arr+j))
            {
                count++;
            }
        }

        if (count > max)
        {   temp=count;
            max = count;
            mode = *(arr+i);
        }
    }
 if (temp>=max)
 {
    return mode;
 }


}
int main()
{
    int arr[10];
   printf("Enter 10 numbers \n");
    for (int i = 0; i < 10; i++)
    {
        scanf("%d", &arr[i]);
    }

    int mode = findMode(arr, 10);

    printf("The mode is: %d", mode);

    return 0;
}
```

Output:

```
PS C:\Users\p22-9269\Desktop\Khizar\Pf lab\EX 10> gcc 2.c
PS C:\Users\p22-9269\Desktop\Khizar\Pf lab\EX 10> ./a.exe
Enter 10 numbers
1
2
3
4
5
5
6
7
8
9
The mode is: 5
```

Problem 3:

```c
#include <stdio.h>
#include <stdlib.h>
#include <time.h>

int main()
{
    int a[10];
    int i, j;
    int num, count;

    srand(time(0));

    for (i = 0; i < 10; i++)
    {
        *(a+i) = rand() % 90 ;
        printf("%d \t ", *(a+i));

    }

    printf("\nEnter a number to search: ");
    scanf("%d", &num);

    count = 0;

    for (i = 0; i < 10; i++)
    {
        if (*(a+i) == num)
     {
            count++;
        }
    }
```

```
    if (count == 0)
     {
        printf("%d does not exist in array.\n", num);
    }
    else
     {
        printf("%d exists %d times in array.\n", num, count);
    }
    return 0;
}
```

Output:

```
PS C:\Users\p22-9269\Desktop\Khizar\Pf lab\EX 10> gcc 3.c
PS C:\Users\p22-9269\Desktop\Khizar\Pf lab\EX 10> ./a.exe
25      82      80      63      40      52      48      30      59      28
Enter a number to search: 63
63 exists 1 times in array.
```

Problem 4: without pointers

```
#include <stdio.h>
void findCommon(int array1[], int array2[], int size1, int size2)
{
    int i, j, k = 0;
    int array3[3]={0};

    for (i = 0; i < size1; i++)
    {
        for (j = 0; j < size2; j++)
        {
            if (array1[i] == array2[j])
            {
                array3[k] = array1[i];
                k++;
            }
        }
    }

    for (i = 0; i < k; i++)
    {
        for (j = 0; j < k - 1; j++)
        {
            if (array3[j] > array3[j+1])
            {
                int temp = array3[j];
                array3[j] = array3[j+1 ];
                array3[j +1 ] = temp;
```

```
            }
        }
    }

    for (i = 0; i < k; i++)
    {
        int flag = 0;
        for (j = 0; j < i; j++)
        {
            if (array3[i] == array3[j])
            {
                flag = 1;
                break;
            }
        }

        if (flag == 0)
        {
            printf("%d ", array3[i]);
        }
    }
}

int main()
{
 int array1[] = {1, 2, 3, 4, 5, 6, 3, 2};
int array2[] = {1, 3, 5, 7};
int size1 = 8;
int size2 = 4;
    findCommon(array1, array2, size1, size2);
    return 0;
}
```

Out put;

```
PS C:\Users\p22-9269\Desktop\Khizar\Pf lab\EX 10> gcc 4.c
PS C:\Users\p22-9269\Desktop\Khizar\Pf lab\EX 10> ./a.exe
1 3 5
PS C:\Users\p22-9269\Desktop\Khizar\Pf lab\EX 10>
```

With pointers

```
#include <stdio.h>
void findCommon(int array1[], int array2[], int size1, int size2)
{
    int i, j, k = 0;
    int array3[3]={0};
```

```
    for (i = 0; i < size1; i++)
    {
        for (j = 0; j < size2; j++)
        {
            if (*(array1+i) == *(array2+j))
            {
                *(array3+k) = *(array1+i);
                k++;
            }
        }
    }

    for (i = 0; i < k; i++)
    {
        for (j = 0; j < k - 1; j++)
        {
            if (*(array3+j) > *(array3+j+1))
            {
                int temp = *(array3+j);
                *(array3+j) = *(array3+j+1);
                *(array3+j +1) = temp;
            }
        }
    }

    for (i = 0; i < k; i++)
    {
        int flag = 0;
        for (j = 0; j < i; j++)
        {
            if (*(array3+i) == *(array3+j))
            {
                flag = 1;
                break;
            }
        }

        if (flag == 0)
        {
            printf("%d ", array3+i);
        }
    }
}

int main()
{
 int array1[] = {1, 2, 3, 4, 5, 6, 3, 2};
int array2[] = {1, 3, 5, 7};
int size1 = 8;
```

```
int size2 = 4;
    findCommon(array1, array2, size1, size2);
    return 0;
}
```

Output:

```
PS C:\Users\p22-9269\Desktop\Khizar\Pf lab\EX 10> gcc 4.c
PS C:\Users\p22-9269\Desktop\Khizar\Pf lab\EX 10> ./a.exe
6421904 6421908 6421912
```