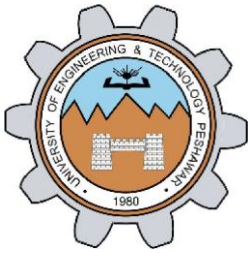
LAB #04
Introduction to C Programming



Spring 2023

CSE-204L Operating Systems Lab

Submitted by: MUHAMMAD SADEEQ

Registration No.: 21PWCSE2028

Section: C

"On my honor, as a student of the University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work"

Submitted to:

Engr. Madiha Sher

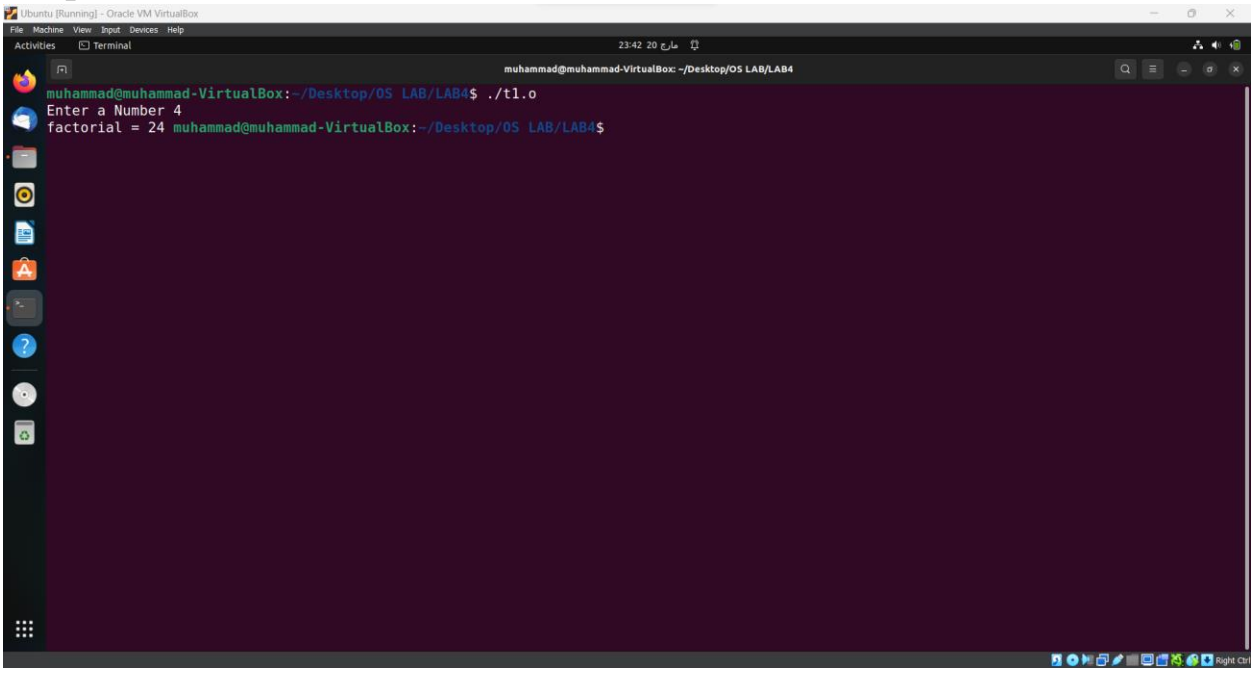
(20 Mar 2023)

Department of Computer systems engineering
University of Engineering and Technology,
Peshawar

TASK 1

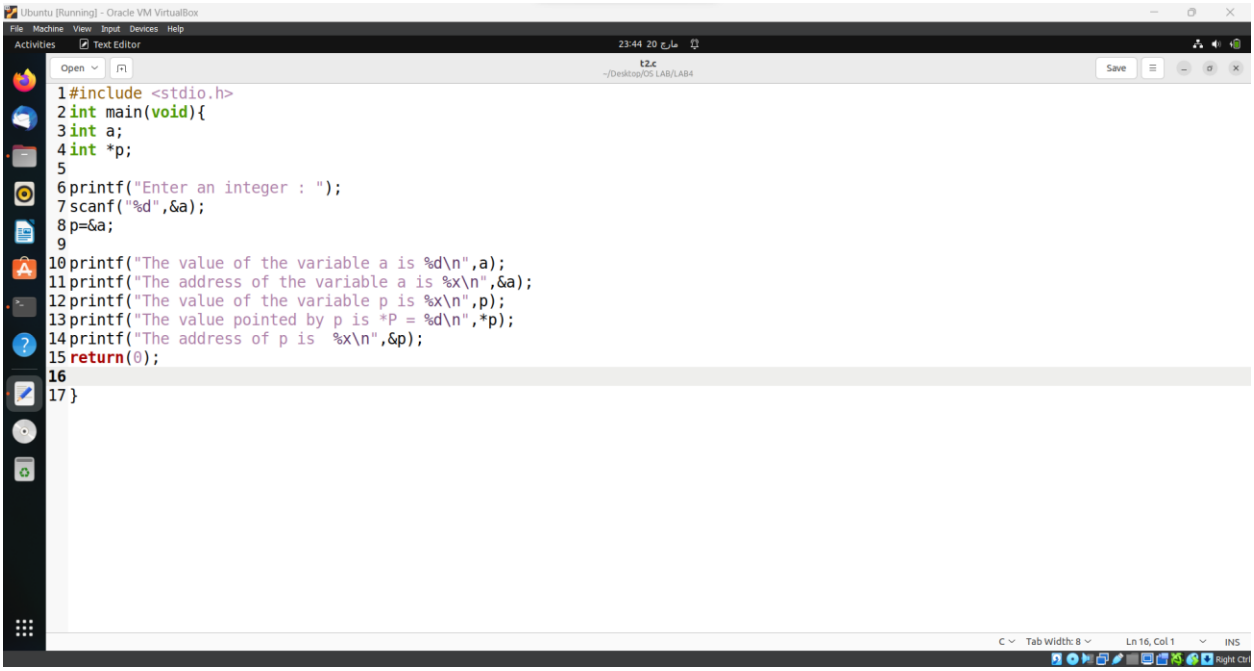
CODE:

Output:

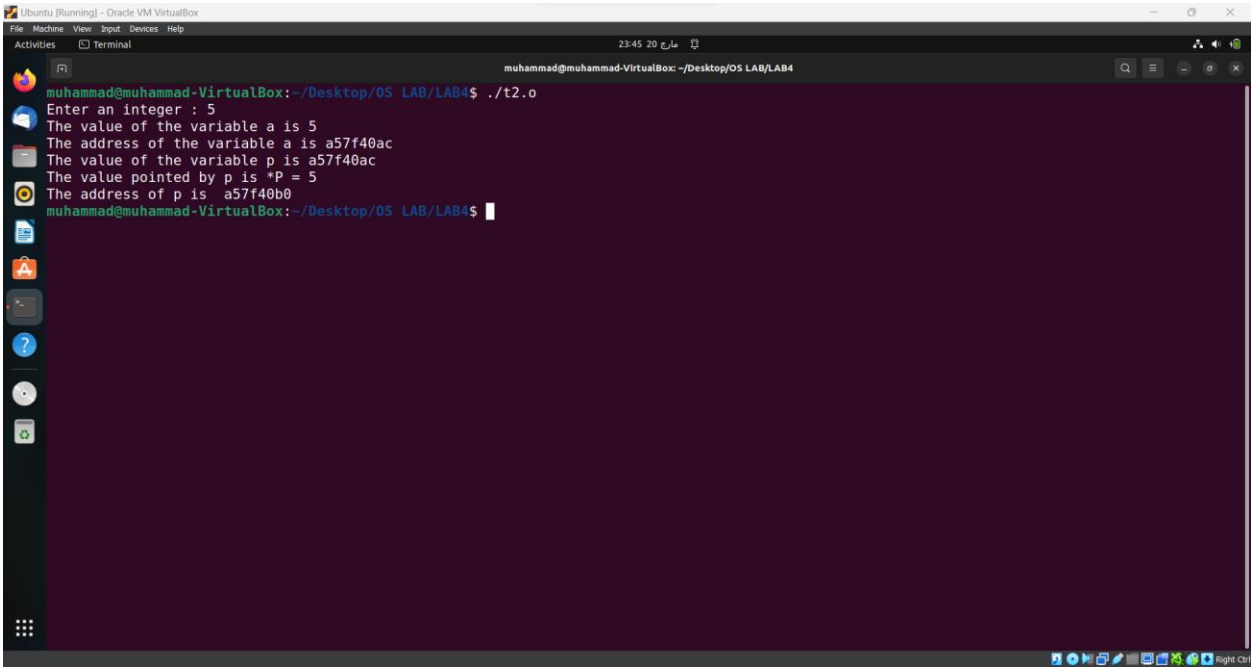


TASK 2

CODE:

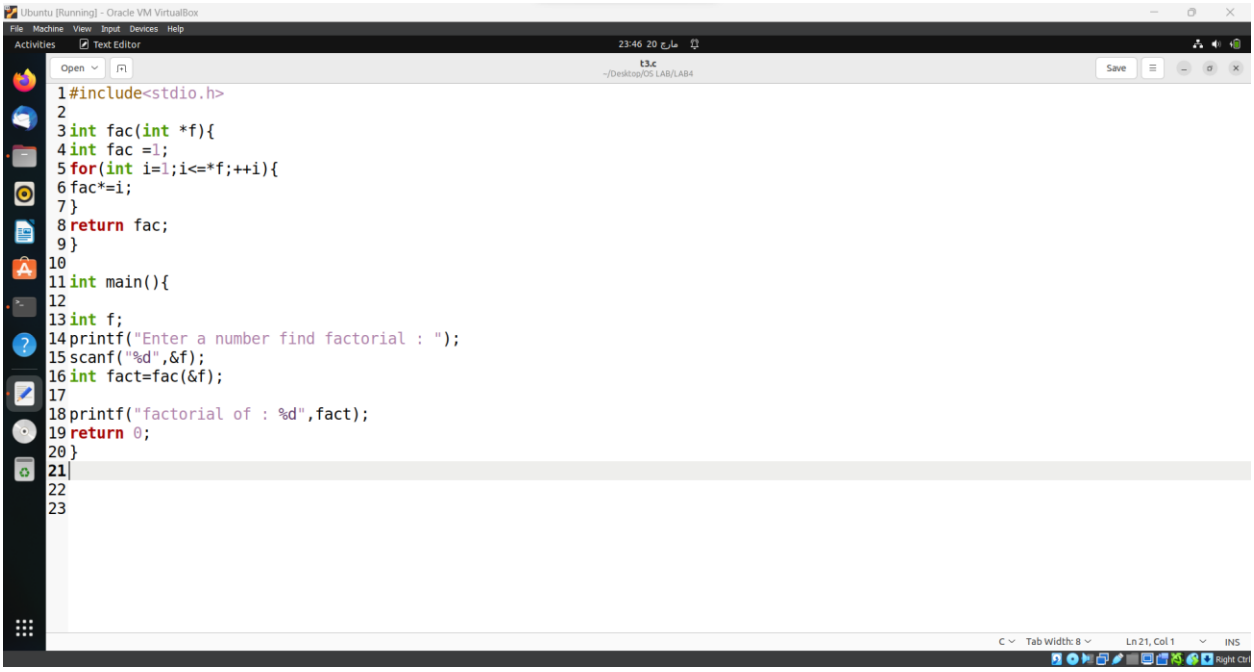


Output:



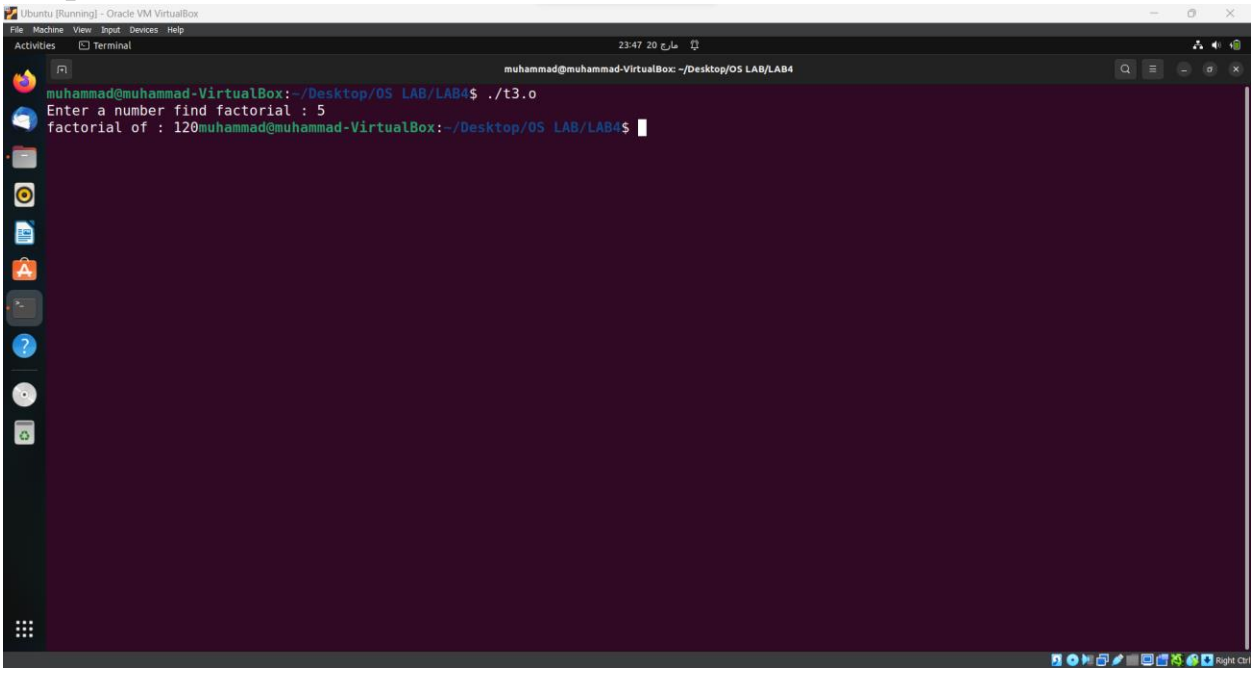
TASK 3

CODE:



```c
#include<stdio.h>

int fac(int *f){
int fac =1;
for(int i=1;i<=*f;++i){
fac*=i;
}
return fac;
}

int main(){

int f;
printf("Enter a number find factorial : ");
scanf("%d",&f);
int fact=fac(&f);

printf("factorial of : %d",fact);
return 0;
}
```

Output:



```
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB4$ ./t3.o
Enter a number find factorial : 5
factorial of : 120muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB4$
```

TASK 4

CODE:

```c
#include<stdio.h>

int dp(int r1,int c1,int a1[r1][c1],int r2,int c2,int a2[r2][c2]){

if(c1!=r2){
return 0;
}
int result = 0;
for(int i = 0;i<r1;i++){
for(int j=0;j<c2;j++){
int sum=0;
for(int k=0;k<c1;k++){
sum += a1[i][j]*a2[k][j];
result+=sum;}
}
}
return result;
}
int main(){
int r1,c1,r2,c2;
printf("Enter the dimention of first array : ");
scanf("%d %d",&r1,&c1);
printf("Enter the dimention of Second array : ");
scanf("%d %d",&r2,&c2);
if(c1!=r2){
printf("error");
return 0;
}

int a1[r1][c1],a2[r2][c2];
printf("enter the elements of the first array : \n");
for(int i=0;i<r1;i++){
for(int j=0;j<c1;j++){
scanf("%d",&a1[i][j]);
}
}
printf("enter the elements of the second array :\n");
for(int i=0;i<r2;i++){
for(int j=0;j<c2;j++){
scanf("%d",&a2[i][j]);
}
}
int result = dp(r1,c1,a1,r2,c2,a2);
printf("the dot product of two arrays is :%d\n",result);
return 0;}
```

Output:

```
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB4$ ^C
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB4$ ./t4.o
Enter the dimention of first array : 2
2
Enter the dimention of Second array :
2
2
enter the elements of the first array :
1 2
3 4
enter the elements of the second array :
4 5
6 7
the dot product of two arrays is :158
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB4$
```

TASK 5

CODE:

```c
#include<stdio.h>
main(){
struct student {
char name[20];
int id;
};

struct student s1,s2,s3;

printf("please enter the student name,and id\n");
scanf(" %s %d", &s1.name, &s1.id);
scanf(" %s %d", &s2.name, &s2.id);
scanf(" %s %d", &s3.name,  &s3.id);

printf("\nThe student details");
printf("\n %s \t\t %d ",s1.name,s1.id);
printf("\n %s \t\t %d ",s2.name,s2.id);
printf("\n %s \t\t %d ",s3.name,s3.id);
}
```

Output:

```
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB4$ ^C
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB4$ ./t5.o
please enter the student name,and id
maaz 41
sadeeq 28
waseem 12

The student details
 maaz            41
 sadeeq                  28
 waseem                  12 muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB4$
```

TASK 6

CODE:

Open · t6.c · ~/Desktop/OS LAB/LAB4 · Save

```c
#include <stdio.h>

struct Time {
   int hour;
   int minute;
   int second;
};
struct Time addTime(struct Time t1, struct Time t2) {
   struct Time result;

   result.second = t1.second + t2.second;
   result.minute = t1.minute + t2.minute + result.second/60;
   result.second = result.second % 60;
   result.hour = t1.hour + t2.hour + result.minute/60;
   result.minute = result.minute % 60;

   return result;}

int main() {
   struct Time time1, time2, result;

   printf("Enter time 1 (hh:mm:ss): ");
   scanf("%d:%d:%d", &time1.hour, &time1.minute, &time1.second);

   printf("Enter time 2 (hh:mm:ss): ");
   scanf("%d:%d:%d", &time2.hour, &time2.minute, &time2.second);

   result = addTime(time1, time2);

   printf("Result: %02d:%02d:%02d\n", result.hour, result.minute, result.second);

   return 0;}
```

Output:

TASK 7

CODE:

```c
#include <stdio.h>

int main() {
    int size, i, j, temp;

    printf("Enter the size of the array: ");
    scanf("%d", &size);

    int arr[size];

    printf("Enter the elements of the array: ");
    for (i = 0; i < size; i++) {
        scanf("%d", &arr[i]);
    }

    // Sort array in ascending order using Bubble Sort algorithm
    for (i = 0; i < size - 1; i++) {
        for (j = 0; j < size - i - 1; j++) {
            if (arr[j] > arr[j+1]) {
                // swap arr[j] and arr[j+1]
                temp = arr[j];
                arr[j] = arr[j+1];
                arr[j+1] = temp;
            }
        }
    }

    printf("Sorted array in ascending order:\n");
    for (i = 0; i < size; i++) {
```

```c
    for (i = 0; i < size; i++) {
        printf("%d ", arr[i]);
    }
    printf("\n");

    return 0;
}

```

Output:

TASK 8

CODE:

t8.c
~/Desktop/OS LAB/LAB4

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

typedef enum { false = 0, true } boolean;

typedef struct list {
    char name[50];
    struct list *next;
} list;

void add(list **head, char *newname);
boolean search(list *head, char *name);
void printList(list *head);

int main() {
    list *head = NULL;
    char choice, name[50];
    boolean found;

    while (1) {
        printf("\nMenu:\n");
        printf("1. Add a name\n");
        printf("2. Search for a name\n");
        printf("3. Print the list\n");
        printf("4. Exit\n");
        printf("Enter your choice (1-4): ");
        scanf(" %c", &choice);

        switch (choice) {
            case '1':
                printf("Enter a name to add: ");
                scanf("%s", name);
                add(&head, name);
                printf("Name added to the list.\n");
                break;
            case '2':
                printf("Enter a name to search: ");
                scanf("%s", name);
                found = search(head, name);
                if (found) {
                    printf("Name found in the list.\n");
                } else {
                    printf("Name not found in the list.\n");
                }
                break;
            case '3':
                printf("List of names:\n");
                printList(head);
                break;
            case '4':
                printf("Exiting the program.\n");
                exit(0);
            default:
                printf("Invalid choice. Please enter a number between 1 and 4.\n");
                break;
        }
    }
```

```
Open   t8.c
~/Desktop/OS LAB/LAB4   Save

59
60      return 0;
61  }
62
63  void add(list **head, char *newname) {
64      list *newnode, *current;
65
66      newnode = (list *)malloc(sizeof(list));
67      strcpy(newnode->name, newname);
68      newnode->next = NULL;
69
70      if (*head == NULL) {
71          *head = newnode;
72      } else {
73          current = *head;
74          while (current->next != NULL) {
75              current = current->next;
76          }
77          current->next = newnode;
78      }
79  }
80
81  boolean search(list *head, char *name) {
82      list *current;
83
84      current = head;
85      while (current != NULL) {
86          if (strcmp(current->name, name) == 0) {
87              return true;
```

```
88          }
89          current = current->next;
90      }
91      return false;
92  }
93
94  void printList(list *head) {
95      list *current;
96
97      if (head == NULL) {
98          printf("List is empty.\n");
99      } else {
100         current = head;
101         while (current != NULL) {
102             printf("%s\n", current->name);
103             current = current->next;
104         }
105     }
106 }
107
```

Output:

```
muhammad@muhammad-VirtualBox: ~/Desktop/OS LAB/LAB4

muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB4$ ^C
muhammad@muhammad-VirtualBox:~/Desktop/OS LAB/LAB4$ ./t8.o

Menu:
1. Add a name
2. Search for a name
3. Print the list
4. Exit
Enter your choice (1-4): 1
Enter a name to add: SADEEQ
Name added to the list.

Menu:
1. Add a name
2. Search for a name
3. Print the list
4. Exit
Enter your choice (1-4): 1
Enter a name to add: WASEEM
Name added to the list.

Menu:
1. Add a name
2. Search for a name
3. Print the list
4. Exit
Enter your choice (1-4): 2
Enter a name to search: SADEEQ
Name found in the list.

Menu:
1. Add a name
2. Search for a name
3. Print the list
4. Exit
Enter your choice (1-4): 3
List of names:
SADEEQ
```


WASEEM
Menu:
1. Add a name
2. Search for a name
3. Print the list
4. Exit
Enter your choice (1-4):