



**Ganpat  
University**

॥ विद्यया समाजोत्कर्षः ॥

**Institute of  
Computer  
Technology**

**Name: Tushar Panchal**

**En.No: 21162101014**

**Sub: OS(Operating Systems)**

**Branch: CBA**

**Batch:41**

## -----PRACTICAL 03-----

### ❖ **Experiment-3 :**

### **Demonstration of various system calls for File operations.**

#### ▪ **Question-1 :**

1. Find Out how many file descriptors are being Used by your Linux system as of now?  
Demonstrate step by step command and O/P. Also design program to check and report file descriptors of all the opened files.

#### **Command 1:-**

```
tushar@tushar-VirtualBox:~/Documents/OS/3$ lsof -u tushar | awk '{print $1,$4}'>tk.txt
tushar@tushar-VirtualBox:~/Documents/OS/3$
```

lsof command stands for a list of the open file and it is used to list all open files with FD (File Descriptor) and other values. The fd value is present in column 4. So I have extracted columns 1 and 4 using awk '{print \$1,\$4}' and stored them in fd.txt and -u for the user, and d3vil is my user.

#### **Command 2:-**

```
tushar@tushar-VirtualBox:~/Documents/new 3$ cat tk.txt | cut -d " " -f 2 | sort -u > new.txt
tushar@tushar-VirtualBox:~/Documents/new 3$
```

Then I listed all data in fd.txt and selected values of column 2 and selected all unique values and stored them in next.txt. cut command is used to extract selected fields from the input and this option -d " " specifies the delimiter as space and -f 2 specifies to extract of the second field. And sort -u will remove all duplicate value data.

### Command 3:-

```
tushar@tushar-VirtualBox:~/Documents/new 3$ cat new.txt | awk '{print}' ORS=' '
0r 0u 100u 101u 102u 103r 103u 104u 104w 105u 106u 107u 108u 108w 109r 109u 10r 10u 10ur 10w 110r 110w 111u 111w 112u 113r 114u
114w 115u 116u 116w 117u 118u 119r 119u 11r 11rr 11u 11w 120u 121u 122u 122w 123r 123u 124u 125u 126u 127u 128r 128u 129w 129w
12r 12u 12ur 12w 130u 131u 132u 133u 134u 134w 135u 136u 137u 138u 139u 13r 13u 13uW 13w 140u 141u 142u 143u 144u 145r 145u 14
6u 147u 148u 149u 14r 14rW 14u 14ur 14w 150u 151u 152u 153u 154u 155u 156u 157u 158u 159u 15r 15u 15ur 15w 160u 161u 162u 163u
164u 165u 166u 167u 168u 169u 16r 16u 16w 170u 171u 172u 173u 174u 175u 176u 177u 178u 179u 17r 17u 17ur 17w 180u 181u 182u 183
u 184u 185u 186u 187u 188u 189u 18r 18u 18ur 18w 190r 191u 192u 193u 194w 195u 196u 197u 198u 199u 19r 19u 19w 1r 1u 1w 200u 20
tushar@tushar-VirtualBox:~/Documents/new 3$
```

The above command listed all File descriptors of the linux system in my case currently running 524, we can check using `wc -l new.txt`.

### ▪ Question-2 :

2. For your online order of any item from amazon, look at the invoice generated by Amazon. Store purchase order details like `order_id`, `order_date`, `item_name`, `item_price`, `delivery_date` in system using file handling system call in a file and print all details related to invoice.

### ✓ Source Code :

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <fcntl.h>

int main()
{
    int fd;
    char *data = (char *)malloc(100 * sizeof(char));
    char *ord_id = (char *)malloc(100 * sizeof(char));
    char *ord_date = (char *)malloc(100 * sizeof(char));
    char *item = (char *)malloc(100 * sizeof(char));
    char *price = (char *)malloc(100 * sizeof(char));
    char *dlv = (char *)malloc(100 * sizeof(char));

    fd = open("order.txt", O_CREAT | O_RDWR);
    printf("File created successfully with file descriptor: %d\n", fd);
    if (fd != -1)
    {
        printf("-----\n");
        printf("Enter order id: ");
        scanf("%s", ord_id);
        write(fd, ord_id, sizeof(ord_id));
        printf("Enter order date: ");
        scanf("%s", ord_date);
        write(fd, ord_date, sizeof(ord_date));
        printf("Enter item name: ");
        scanf("%s", item);
        write(fd, item, sizeof(item));
        printf("Enter item price: ");
        scanf("%s", price);
        write(fd, price, sizeof(price));
    }
}
```

```

printf("Enter item delivery date: ");
scanf("%s", dlv);
write(fd, dlv, sizeof(dlv));
lseek(fd, 0, SEEK_SET);
printf("-----\n");
printf("\n-----***** Invoice *****\n");
read(fd, data, sizeof(ord_id));
printf("Order ID: %s\n", data);
read(fd, data, sizeof(ord_date));
printf("Order Date: %s\n", data);
read(fd, data, sizeof(item));
printf("Item Name: %s\n", data);
read(fd, data, sizeof(price));
printf("Item Price: %s\n", data);
read(fd, data, sizeof(dlv));
printf("Order will be delivered by %s\n", data);
}
close(fd);
}

```

### ✓ Output :

```

tushar@tushar-VirtualBox:~/Documents/new 3$ ./2
File created successfully with file descriptor: 3
-----
Enter order id: 007
Enter order date: 01-02-2023
Enter item name: cigar
Enter item price: 2500
Enter item delivery date: 01-02-2023
-----
-----***** Invoice *****-----
Order ID: 007
Order Date: 01-02-20
Item Name: cigar
Item Price: 2500
Order will be delivered by 01-02-20
tushar@tushar-VirtualBox:~/Documents/new 3$ █

```

### ▪ **Question-3 :**

3. Implement program that can open the file "ICTGUNI.txt" in the current directory, and prints out the return value of the open() system call. If " ICTGUNI.txt " exists, open() will return a non-negative integer (three). If " ICTGUNI.txt " does not exist, then it will return -1.

### ✓ **Source Code :**

```
#include <stdio.h>
#include <unistd.h>
#include <fcntl.h>
int main()
{
    int fd, fd1;
    fd = open("ICTGUNI.txt", O_RDWR);
    printf("File Descriptor;%d\n", fd);
    if (fd == -1)
    {
        printf("File Does not Exist. Creating the file.\n");
        fd1 = creat("ICTGUNI.txt", O_RDWR);
        printf("File descriptor: %d\nFile Created Successfully.\n", fd1);
    }
    return 0;
}
```

### ✓ **Output :**

```
tushar@tushar-VirtualBox:~/Documents/new 3$ ./3
File Descriptor;-1
File Does not Exist. Creating the file.
File descriptor: 3
File Created Successfully.
```