Operating Systems

Lab – 07

Objectives:

- Process Management

Resources:

- Video Lecture 07 : Process Management

Linux Environment

Perform all the tasks on your machine and write in your notebook the particular one's.

1. Create a **lab07/** directory on your desktop and perform the following tasks in it.

C Compilation

Task 01:

Write a **C** program to print "Everything in UNIX is a File" on stdout.

a) Create a **preprocessed** code file of your source C program.
b) Create an **assembly** code file of your source C program.
c) Create an **object** file of your source C program.
d) Create an **executable** file of your source C program.

NOTE:

*You must have a clear understanding about each file **generated** during the compilation process.*

Task 02:

a) Display the **"disassembly"** of the executable in intel format. (Use **objdump** cmd with appropriate flags)
b) Display **"Section Headers"** of the executable and note down the **count** of section headers in the executable. (Use **readelf** cmd with appropriate flag)
c) Display the **"Program Headers"**. (Use **readelf** cmd with appropriate flag)
d) Display the **"ELF header"**. (Use **readelf** cmd with appropriate flag)

Task 03:

Create a file named **cat.c** and place the following code in it.The **program** mimics the general behavior of the "**cat**" command.

```
#include<stdio.h>
#include<unistd.h>
#include<stdlib.h>
#include<fcntl.h>
int main(int argc, char *argv[]) {
        write(1, "Hi, I am your own cat ;)\n", 31);
        int fd = 0;
        if(argc > 1)
        {
                fd = open(argv[1], O_RDONLY);
        }
        int rv = 0;
        char buff[1024];
        while(rv = read(fd, buff, 1024))
        {
                write(1, buff, rv);
        }
        return 0;
}
```

*Perform the following task on **cat.c***

a) Compile and Link the Given Program **Statically** and **Dynamically**. Give each binary a different names.
b) Use **readelf**, **od**, **size** commands to get different attributes of your executable program files.

Process Management

Task 04:

a) How can you get information about all the processes **running** on your linux OS?
b) Write a command to get **information** about how long the system has been running.
c) Display the **free** and used **memory** on your system.
d) Run the **sleep** command for 50 sec, suspend its execution and then run it in the background. Execute the program in the **background**, and then bring it to the **foreground**.Meanwhile in another terminal keep checking various statistics of your process using **ps** with **–u** and **–l** options.

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"The Linux philosophy is *'Laugh in the face of danger'.*

Oops. Wrong One. *'Do it yourself*'. Yes, that's it. - **Linus Torvalds**"