

OS ASSIGNMENT 05

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ROLL NO : 29

'F' SECTION

QUESTION: Write a C program to truncate the files in a directory created before a certain date to half its original size. Inputs to the program: directory and date as run time arguments.

CODE:

```
#include <stdio.h>
#include <stdlib.h>
#include <dirent.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <fcntl.h>
#include <unistd.h>
```

```
#include <time.h>
```

```
int isCreationTimeBefore(const char *filePath, const char  
*dateTime)
```

```
{
```

```
    struct stat st;
```

```
    // Get file status
```

```
    if (stat(filePath, &st) == 0)
```

```
    {
```

```
        // Extract the file creation time from the file status structure
```

```
        time_t creationTime = st.st_ctime;
```

```
        // Convert the creation time to a struct tm
```

```
        struct tm *tmCreationTime = gmtime(&creationTime);
```

```
        // Parse the input date time string manually
```

```
        int year, month, day, hour, minute, second;
```

```
        sscanf(dateTime, "%d-%d-%d %d:%d:%d", &year, &month,  
&day, &hour, &minute, &second);
```

```
        // Set the fields of the struct tm for the input date time
```

```
        struct tm tmDateTime;
```

```
        tmDateTime.tm_year = year - 1900;
```

```
tmDateTime.tm_mon = month - 1;
```

```
tmDateTime.tm_mday = day;
```

```
tmDateTime.tm_hour = hour;
```

```
tmDateTime.tm_min = minute;
```

```
tmDateTime.tm_sec = second;
```

```
// Convert the input date time to time_t
```

```
time_t timeDateTime = mktime(&tmDateTime);
```

```
// Compare the file creation time with the input date time
```

```
if (mktime(tmCreationTime) < timeDateTime)
```

```
{
```

```
    return 1;
```

```
}
```

```
else
```

```
{
```

```
    return 0;
```

```
}
```

```
}
```

```
else
```

```
{
```

```
    printf("Failed to get file status: %s\n", filePath);
```

```
    return -1;
```

```
}
```

```
}
```

```
void truncateFiles(const char *dirPath, const char *datetime)
```

```
{
```

```
    DIR *dir;
```

```
    struct dirent *entry;
```

```
    struct stat st;
```

```
    char filePath[1024];
```

```
    off_t fileSize;
```

```
    // Open the directory
```

```
    dir = opendir(dirPath);
```

```
    if (dir == NULL)
```

```
    {
```

```
        printf("Failed to open directory: %s\n", dirPath);
```

```
        return;
```

```
    }
```

```
    // Read entries from the directory
```

```
    while ((entry = readdir(dir)) != NULL)
```

```
    {
```

```
        if (entry->d_type == DT_REG)
```

```
        { // Regular file
```

```
snprintf(filePath, sizeof(filePath), "%s/%s", dirPath, entry->d_name);
```

```
// Get file status
```

```
if (stat(filePath, &st) == 0)
```

```
{
```

```
    fileSize = st.st_size;
```

```
    // Truncate file to half its size
```

```
    off_t newFileSize = fileSize / 2;
```

```
    int fd = open(filePath, O_WRONLY);
```

```
    if (fd == -1)
```

```
{
```

```
    printf("Failed to open file: %s\n", filePath);
```

```
    continue;
```

```
}
```

```
if (isCreationTimeBefore(filePath, datetime))
```

```
{
```

```
    if (ftruncate(fd, newFileSize) == -1)
```

```
{
```

```
    printf("Failed to truncate file: %s\n", filePath);
```

```
    close(fd);
```

```
    continue;
```

```
}
```

```
close(fd);
```

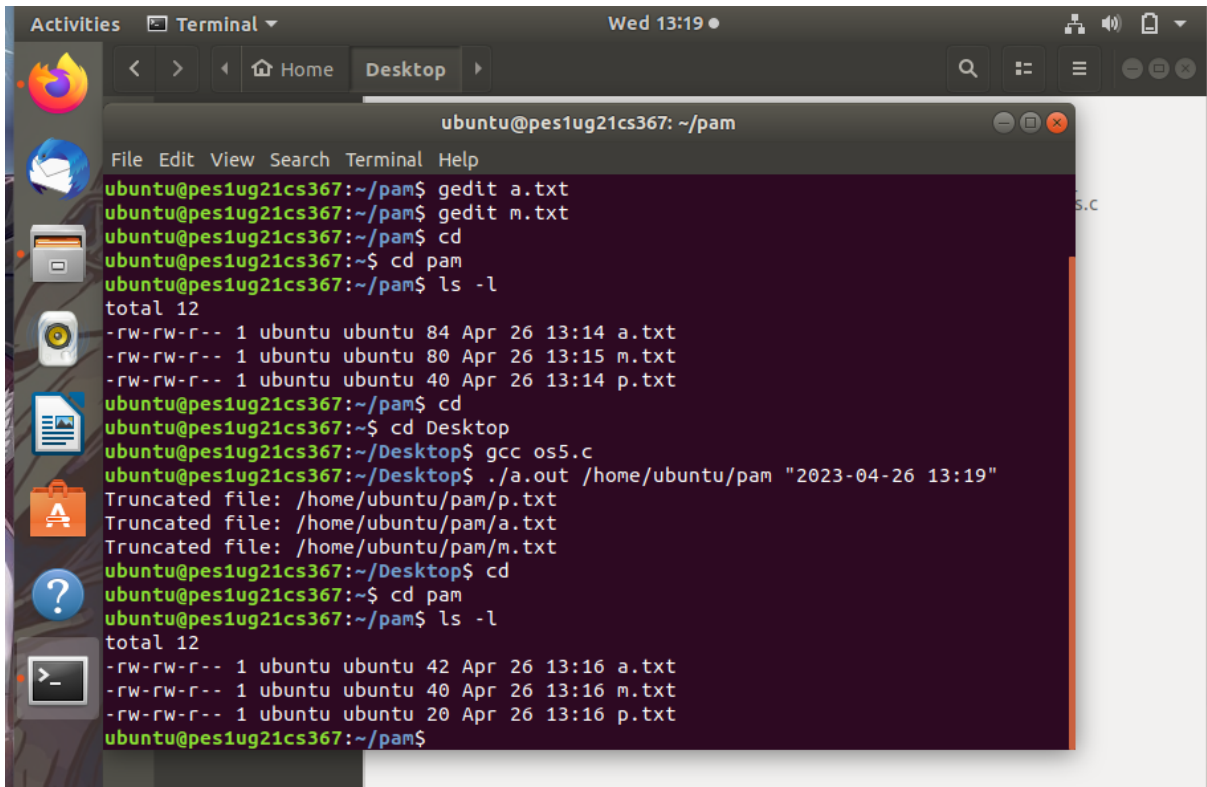
```
        printf("Truncated file: %s\n", filePath);
    }
}
else
{
    printf("Failed to get file status: %s\n", filePath);
}
}
}
```

```
// Close the directory
closedir(dir);
}
```

```
int main(int argc, char *argv[])
{
    // Check for correct number of arguments
    if (argc != 3)
    {
        printf("Usage: %s <directory> <date_time>\n", argv[0]);
        printf("Example: %s /path/to/directory \"2023-04-26  
12:20:56\"\n", argv[0]);
        return 1;
    }
}
```

```
const char *dirPath = argv[1];  
const char *dateTime = argv[2];  
  
// Call the truncateFiles function  
truncateFiles(dirPath, dateTime);  
  
return 0;  
}
```

SNAPS:



The screenshot shows a terminal window titled "Terminal" with a dark background. The user is logged in as "ubuntu" on a machine named "pes1ug21cs367". The terminal shows the following sequence of commands and output:

```
ubuntu@pes1ug21cs367: ~/pam  
File Edit View Search Terminal Help  
ubuntu@pes1ug21cs367:~/pam$ gedit a.txt  
ubuntu@pes1ug21cs367:~/pam$ gedit m.txt  
ubuntu@pes1ug21cs367:~/pam$ cd  
ubuntu@pes1ug21cs367:~$ cd pam  
ubuntu@pes1ug21cs367:~/pam$ ls -l  
total 12  
-rw-rw-r-- 1 ubuntu ubuntu 84 Apr 26 13:14 a.txt  
-rw-rw-r-- 1 ubuntu ubuntu 80 Apr 26 13:15 m.txt  
-rw-rw-r-- 1 ubuntu ubuntu 40 Apr 26 13:14 p.txt  
ubuntu@pes1ug21cs367:~/pam$ cd  
ubuntu@pes1ug21cs367:~$ cd Desktop  
ubuntu@pes1ug21cs367:~/Desktop$ gcc os5.c  
ubuntu@pes1ug21cs367:~/Desktop$ ./a.out /home/ubuntu/pam "2023-04-26 13:19"  
Truncated file: /home/ubuntu/pam/p.txt  
Truncated file: /home/ubuntu/pam/a.txt  
Truncated file: /home/ubuntu/pam/m.txt  
ubuntu@pes1ug21cs367:~/Desktop$ cd  
ubuntu@pes1ug21cs367:~$ cd pam  
ubuntu@pes1ug21cs367:~/pam$ ls -l  
total 12  
-rw-rw-r-- 1 ubuntu ubuntu 42 Apr 26 13:16 a.txt  
-rw-rw-r-- 1 ubuntu ubuntu 40 Apr 26 13:16 m.txt  
-rw-rw-r-- 1 ubuntu ubuntu 20 Apr 26 13:16 p.txt  
ubuntu@pes1ug21cs367:~/pam$
```

```
Activities Terminal Wed 13:17
ubuntu@pes1ug21cs367: ~/Desktop
File Edit View Search Terminal Help
ubuntu@pes1ug21cs367:~$ mkdir pam
ubuntu@pes1ug21cs367:~$ cd pam
ubuntu@pes1ug21cs367:~/pam$ gedit p.txt
ubuntu@pes1ug21cs367:~/pam$ gedit a.txt
ubuntu@pes1ug21cs367:~/pam$ gedit m.txt
ubuntu@pes1ug21cs367:~/pam$ cd
ubuntu@pes1ug21cs367:~$ cd pam
ubuntu@pes1ug21cs367:~/pam$ ls -l
total 12
-rw-rw-r-- 1 ubuntu ubuntu 84 Apr 26 13:14 a.txt
-rw-rw-r-- 1 ubuntu ubuntu 80 Apr 26 13:15 m.txt
-rw-rw-r-- 1 ubuntu ubuntu 40 Apr 26 13:14 p.txt
ubuntu@pes1ug21cs367:~/pam$ cd
ubuntu@pes1ug21cs367:~$ cd Desktop
ubuntu@pes1ug21cs367:~/Desktop$ gcc os5.c
ubuntu@pes1ug21cs367:~/Desktop$ ./a.out /home/ubuntu/pam "2023-04-26 13:19"
Truncated file: /home/ubuntu/pam/p.txt
Truncated file: /home/ubuntu/pam/a.txt
Truncated file: /home/ubuntu/pam/m.txt
ubuntu@pes1ug21cs367:~/Desktop$
```

```
Activities Terminal Wed 13:15
ubuntu@pes1ug21cs367: ~/pam
File Edit View Search Terminal Help
ubuntu@pes1ug21cs367:~$ mkdir pam
ubuntu@pes1ug21cs367:~$ cd pam
ubuntu@pes1ug21cs367:~/pam$ gedit p.txt
ubuntu@pes1ug21cs367:~/pam$ gedit a.txt
ubuntu@pes1ug21cs367:~/pam$ gedit m.txt
ubuntu@pes1ug21cs367:~/pam$ cd
ubuntu@pes1ug21cs367:~$ cd pam
ubuntu@pes1ug21cs367:~/pam$ ls -l
total 12
-rw-rw-r-- 1 ubuntu ubuntu 84 Apr 26 13:14 a.txt
-rw-rw-r-- 1 ubuntu ubuntu 80 Apr 26 13:15 m.txt
-rw-rw-r-- 1 ubuntu ubuntu 40 Apr 26 13:14 p.txt
ubuntu@pes1ug21cs367:~/pam$
```

---THANK YOU---