ELP718 Telecom Software Laboratory

1st Semester, 2016-18

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Assignment-9

Contents

0.1 Introduction

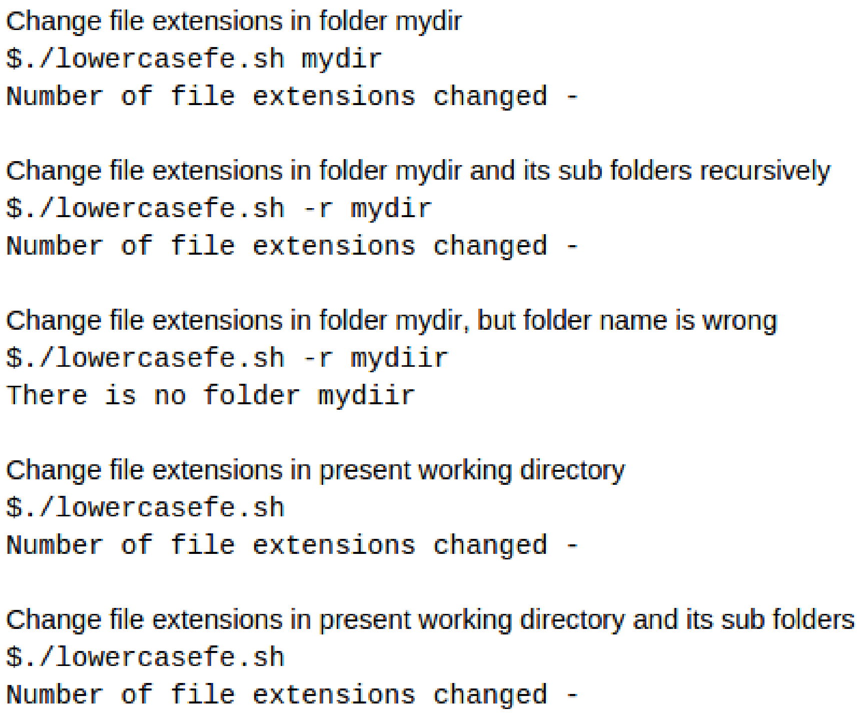
This assignment aims to provide a better understanding of the following topics:

1. **Python**
Python is a widely used high-level, general-purpose, interpreted, dynamic programming language.[24][25] Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code than possible in languages such as C++ or Java.[26][27] The language provides constructs intended to enable writing clear programs on both a small and large scale.[28] Python supports multiple programming paradigms, including object-oriented, imperative and functional programming or procedural styles. It features a dynamic type system and automatic memory management and has a large and comprehensive standard library.[29]
Python interpreters are available for many operating systems, allowing Python code to run on a wide variety of systems. Using third-party tools, such as Py2exe or Pyinstaller,[30] Python code can be packaged into stand-alone executable programs for some of the most popular operating systems, so Python-based software can be distributed to, and used on, those environments with no need to install a Python interpreter.
CPython, the reference implementation of Python, is free and open-source software and has a community-based development model, as do nearly all of its variant implementations. CPython is managed by the non-profit Python Software Foundation.

2. **SQL**
MySQL is an open-source relational database management system (RDBMS). Its name is a combination of "My", the name of co-founder Michael Widenius' daughter,and , the abbreviation for Structured Query Language. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation. For proprietary use, several paid editions are available, and offer additional functionality. MySQL is a central component of the LAMP open-source web application software stack (and other "AMP" stacks). LAMP is an acronym for "Linux, Apache, MySQL, Perl/PHP/Python". Applications that use the MySQL database include: TYPO3, MODx, Joomla, WordPress, phpBB, MyBB, and Drupal. MySQL is also used in many high-profile, large-scale websites, including Google (though not for searches), Facebook, Twitter, Flickr, and YouTube.

0.2 Problem Statement 1

This problem requires us to take input through command line argument from the user and then process it similar to following outputs:



Change file extensions in folder mydir

```
$./lowercasefe.sh mydir
Number of file extensions changed -
```

Change file extensions in folder mydir and its sub folders recursively

```
$./lowercasefe.sh -r mydir
Number of file extensions changed -
```

Change file extensions in folder mydir, but folder name is wrong

```
$./lowercasefe.sh -r mydiir
There is no folder mydiir
```

Change file extensions in present working directory

```
$./lowercasefe.sh
Number of file extensions changed -
```

Change file extensions in present working directory and its sub folders

```
$./lowercasefe.sh
Number of file extensions changed -
```

0.2.1 Assumptions

The user shall input either no name to a directory or he will enter an existing directory.

0.2.2 Structure Chart and Implementation

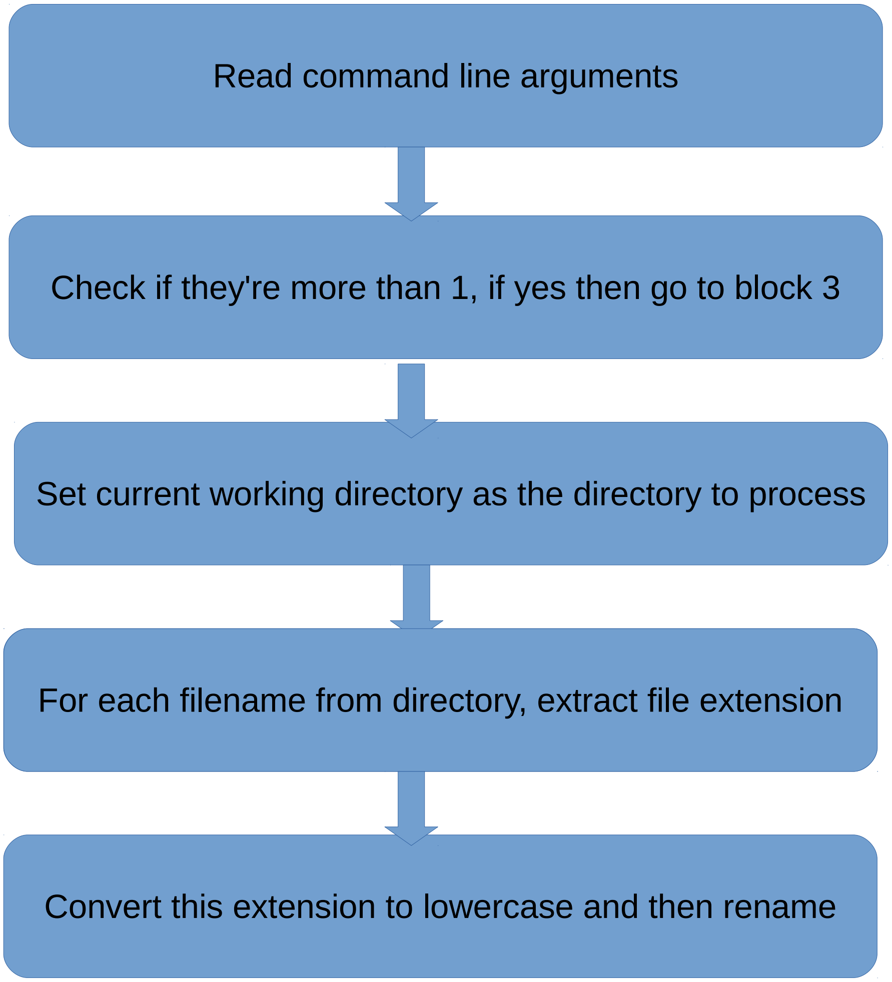
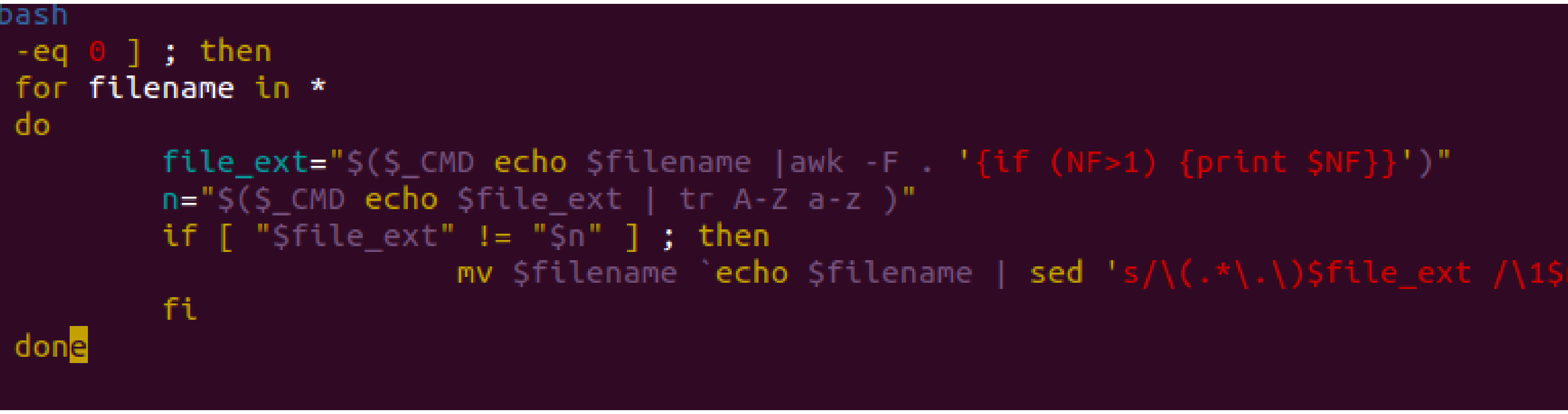

Read command line arguments
Check if they're more than 1, if yes then go to block 3
Set current working directory as the directory to process
For each filename from directory, extract file extension
Convert this extension to lowercase and then rename

Figure 1: Structure chart for problem 1

0.2.3 Screenshots

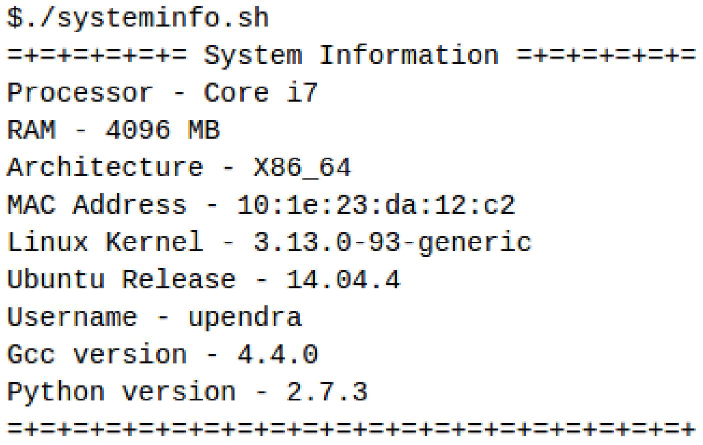


```
bash
 -eq 0 ] ; then
 for filename in *
 do
        file_ext="$($_CMD echo $filename |awk -F . '{if (NF>1) {print $NF}}')"
        n="$($_CMD echo $file_ext | tr A-Z a-z )"
        if [ "$file_ext" != "$n" ] ; then
                        mv $filename `echo $filename | sed 's/\(.*\.\)$file_ext /\1$
        fi
 done
```

Figure 2: Screenshot for problem statement 1

0.3 Problem Statement 2

The problem requires you to display system information in the following manner.

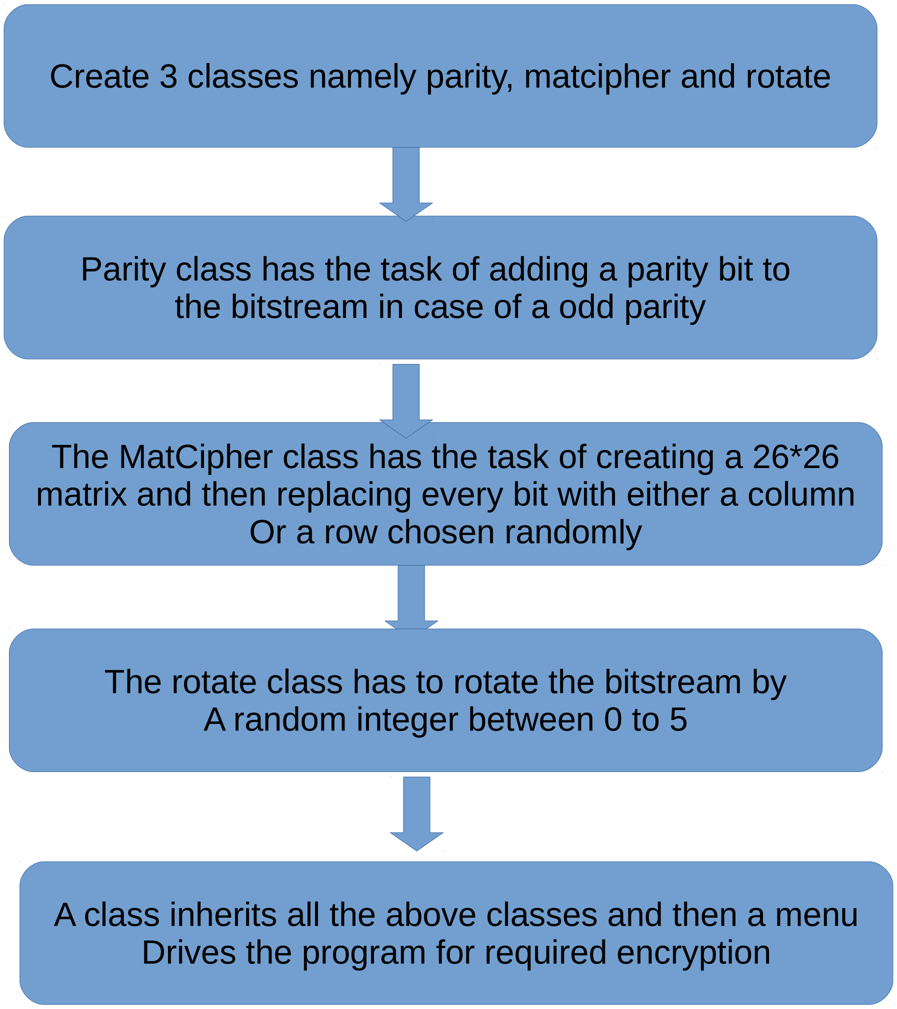


```
$./systeminfo.sh
=+=+=+=+=+= System Information =+=+=+=+=+=
Processor - Core i7
RAM - 4096 MB
Architecture - X86_64
MAC Address - 10:1e:23:da:12:c2
Linux Kernel - 3.13.0-93-generic
Ubuntu Release - 14.04.4
Username - upendra
Gcc version - 4.4.0
Python version - 2.7.3
=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+
```

0.3.1 Assumptions

The output is to be processed in the exact manner as shown in the image

0.3.2 Structure Chart



Create 3 classes namely parity, matcipher and rotate

Parity class has the task of adding a parity bit to the bitstream in case of a odd parity

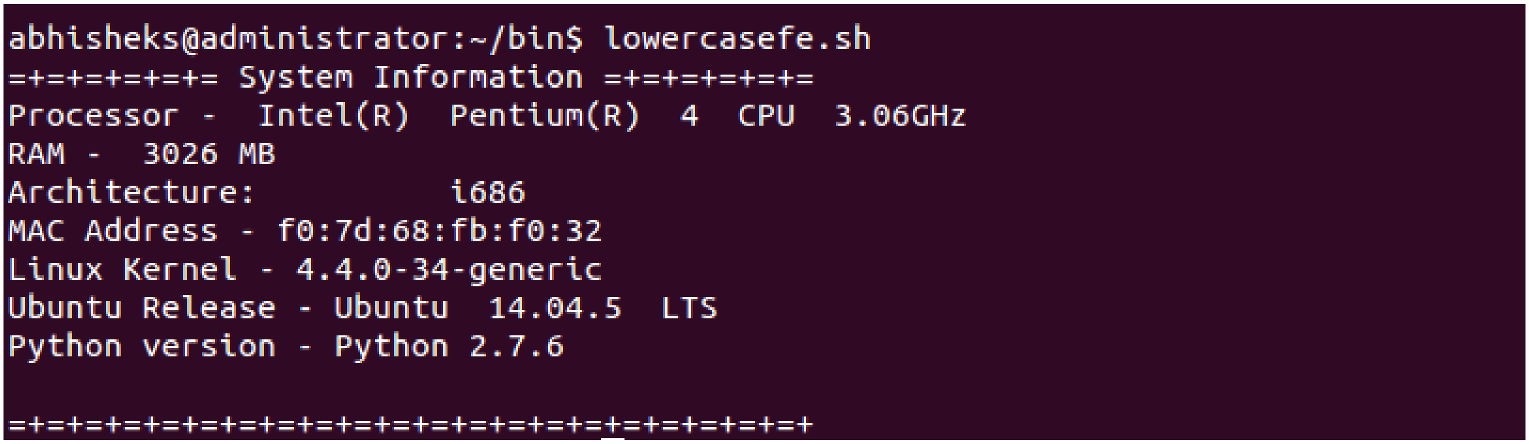
The MatCipher class has the task of creating a 26*26 matrix and then replacing every bit with either a column Or a row chosen randomly

The rotate class has to rotate the bitstream by A random integer between 0 to 5

A class inherits all the above classes and then a menu Drives the program for required encryption

Figure 3: Structure chart for problem 2

0.3.3 Screenshots



```
abhisheks@administrator:~/bin$ lowercasefe.sh
=+=+=+=+=+= System Information =+=+=+=+=+=
Processor -  Intel(R)  Pentium(R)  4  CPU  3.06GHz
RAM -  3026 MB
Architecture:          i686
MAC Address - f0:7d:68:fb:f0:32
Linux Kernel - 4.4.0-34-generic
Ubuntu Release - Ubuntu  14.04.5  LTS
Python version - Python 2.7.6

=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+
```

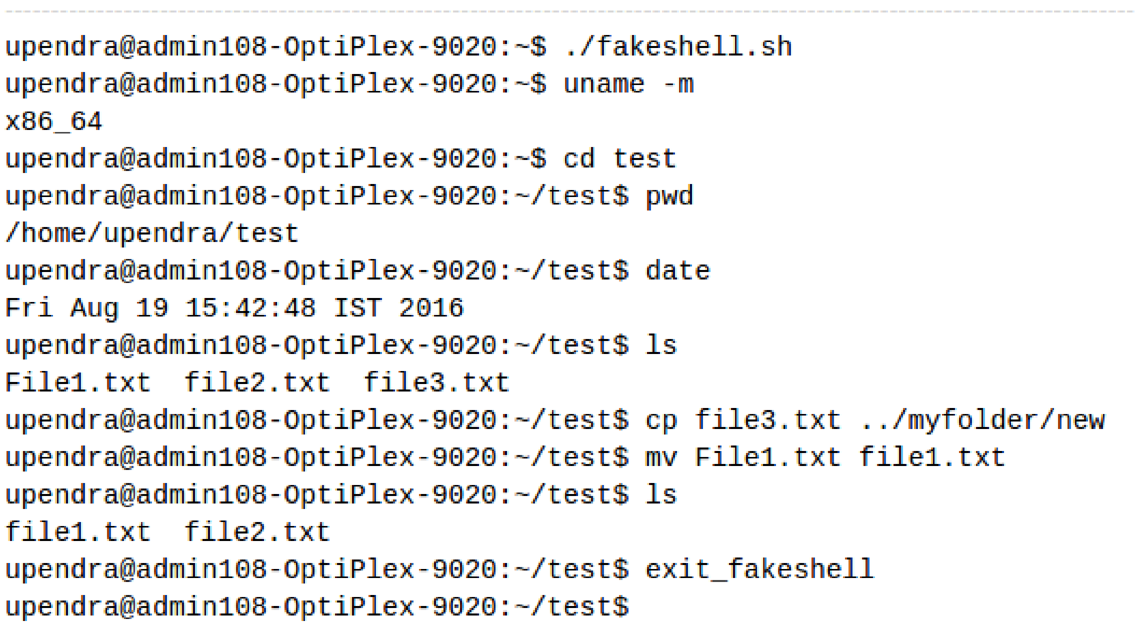
Figure 4: Screenshot for problem statement 2

0.4 Problem Statement 3

Part - 1 -
Write shell script to emulate behaviour of bash, but also record every command put up on terminal on a logger.txt file along with time stamp. Your command prompt should look like normal bash command prompt.

0.4.1 Assumptions

The output is to be processed in the exact manner as shown in the image



```
upendra@admin108-OptiPlex-9020:~$ ./fakeshell.sh
upendra@admin108-OptiPlex-9020:~$ uname -m
x86_64
upendra@admin108-OptiPlex-9020:~$ cd test
upendra@admin108-OptiPlex-9020:~/test$ pwd
/home/upendra/test
upendra@admin108-OptiPlex-9020:~/test$ date
Fri Aug 19 15:42:48 IST 2016
upendra@admin108-OptiPlex-9020:~/test$ ls
File1.txt  file2.txt  file3.txt
upendra@admin108-OptiPlex-9020:~/test$ cp file3.txt ../myfolder/new
upendra@admin108-OptiPlex-9020:~/test$ mv File1.txt file1.txt
upendra@admin108-OptiPlex-9020:~/test$ ls
file1.txt  file2.txt
upendra@admin108-OptiPlex-9020:~/test$ exit_fakeshell
upendra@admin108-OptiPlex-9020:~/test$
```

0.4.2 Structure Chart

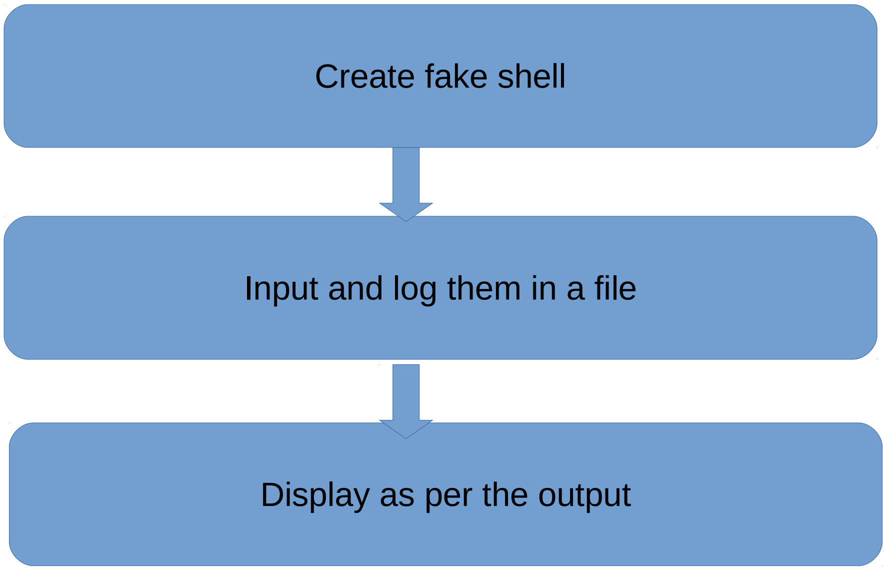


Figure 5: Structure chart for problem 3

0.5 Epilogue

The execution of the first problem involved me to break it down and then try to figure out solution to each and every part of it. To some extent I feel I have been successful in justifying the problem.
Whereas for problem statement 2, it was a different but not so difficult problem statement compared to problem 1.
Then i found the problem 3 to be the toughest of all problems.
This week's assignment too has taught me a lot of things on which I shall further improve upon in the next assignment.

Bibliography

[1] “tutorialspoint.com.” `http://www.tutorialspoint.com/python`.

[2] “tutorialspoint.com.” `http://www.tutorialspoint.com/mysql`.