Unix 2: The McGumption Files Exercise

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Instructions

This is the fourth and final handout for the Unix 2 course. It presents a longer and more complex practical exercise than those you have covered already, in the form of a puzzle.

You may not have time to complete every step during today's training hours. However the practical has been designed so that you can take it away and complete it in your own time if you wish.

Some parts of the puzzle can be solved by long, tiresome repetition. However at each point you can make progress with one or two carefully chosen UNIX commands.

As you work through the practical you will be reviewing material covered earlier today and you may find it helpful to refer back to the first three books of the course. If you get stuck there are hints at the back of the book.

First you must obtain a copy of the files used in the practical by anonymous ftp.

They are kept on `ftp.ed.ac.uk` in the file `pub/Unix2/mcgfiles.tar` - download that. Remember to use binary mode. You can then unpack the file - you should know how.

You will end up with a directory called `mcgfiles`. Change into this directory. All the tasks in this practical concern the files you have just obtained.

The story so far

On the night of 25th August 1996, Daphne Postlethwaite murdered Major Duncan McGumption at the McGumption mansion just outside Penicuik. She stole into his bedroom with a heavy brass candlestick and struck him repeatedly on the back of the head.

The case was solved by a resourceful detective who used the UNIX operating system to assist the investigation. Daphne was duly tried and given twenty years in prison.

At the time it seemed obvious that Daphne's crime had been an act of simple revenge. The major had been partly responsible for her bankruptcy some years before. The motive was clear and the case was closed.

It now appears Daphne's motives may have been entirely different...

The discovery

A few months after the Major's death, his wife Maria and son Martin sold the estate and moved on. The new owners moved in and have had no problems with the house.

However last week someone leant against a panel in the Major's former study and a cleverly concealed compartment swung open. Inside was a small digital cassette for storing computer files. The new owners passed this to the police, who were baffled by its contents. They passed it on to the only person they knew of who understood this stuff - the detective who solved the McGumption murder case.

That's you.

The McGumption Files

Examining the tape you find five files in the directory `mcgfiles` named `file1` to `file5`.
Each has been encrypted with the Unix program `crypt`.

Once you have the correct keyword to unlock each file, you can read them in this way:

```
bash$ crypt keyword < file1
```

Solving the case

You must decode the deceased Major's files and act on their contents. Begin by trying to work out the keywords for files 1-5.

The practical has been designed to offer you a choice of problems to work on at each stage. You can work through the files in whatever order you choose. Remember there are hints at the back of this workbook.

You will find it useful to keep notes of where you find new files and what their keywords are. Space is provided for this later in the workbook.

Finding out keywords

File 1

The tape has the word `burma` written on it in black marker pen. Could this be a clue?

File 2

The keyword for this file is the 47th word in the file `major/key2`. This file is only one line long.

File 3

The largest file under the `mcgfiles` directory contains the keyword. It may be several subdirectories down.

File 4

Run the script `major/getkey4`. Compare its output with the contents of the file `library/drac.txt`. The output of the script includes one additional word - that is the keyword.

File 5

Use the file `library/drac.txt` again. This time find the only line which begins with the letter e and ends with the letter d. The fifth word on that line is the keyword.

Keywords for other files

Should you discover other McGumption files, they will also be encrypted. You will have to find clues to their keywords along the way.

Notes

Hints

File 1

You need to use the crypt program to unlock this file, as explained earlier in this workbook. Perhaps that word `burma` is the keyword you will need?

File 2

You need to extract the 47th field from that one line of text...perhaps the `awk` program might help.

File 3

The largest file will be the one which takes up the most disk space. You need a command which shows you disk usage and one to sort the results into order.

File 4

The simplest way to tackle this would probably be to write the output of the script to a file, then compare that file with `library/drac.txt`.

File 5

`egrep` lets you select lines from a file. What you are looking for is a line starting with the letter e, then containing a number of random characters and finishing with the letter d.

Hints

File A

You will have to obtain a list of words which are spelt incorrectly by UK spelling and a list of those which are spelt incorrectly by USA spelling, then compare these lists. It is likely that quite a few words will be correct for the UK but not the USA - you want the one which is the other way round.

File B

This is a two part problem. First you must extract only lines which contain the string `the` and then you must print one line in particular. You could achieve this in one go by using a pipe.

File C

You need to use the `find` command to search the filesystem in some way which will examine the contents of files.

File X

You will need to read files A, B and C before you will be able to read this file.

File Z

You need to use the `find` command in a different way here.

Final task

There is an argument to ls which lists the octal values of non-alphanumeric characters. And Unix supplies a command line calculator.