Assignment 1

Upload your solutions to Einstein to verify that they are correct.

Links:

Einstein is [here](#).

Termcast is [here](#).

Getting Started

1. Create a file named hello.sh with the following content:

```
#!/bin/sh
echo hello
```

- Upload this file to Einstein.
- No marks for this task.

Finding Files Using Shell Scripts

Assume that the current working directory contains multiple files, directories, and sub-directories of unknown depth.

1. Find All Files: Write a shell script named `wk1-find-all-files.sh` that outputs the names of all regular files (not directories).
2. Find All Directories: Write a shell script named `wk1-find-all-directories.sh` that outputs the names of all directories (including the current directory).
3. Find All Empty Files: Write a shell script named `wk1-find-all-empty-files.sh` that outputs the names of all empty files (not directories).
4. Find All Empty Directories: Write a shell script named `wk1-find-all-empty-directories.sh` that outputs the names of all empty directories (not files).

5. Find All Shell Scripts: Write a shell script named wk1-find-all-shell-scripts.sh that outputs the names of all regular files with the suffix .sh.
6. Find All Non-Shell Scripts: Write a shell script named wk1-find-all-non-shell-scripts.sh that outputs the names of all regular files that do not have the .sh suffix.

Handling Archives

Here is a sample zip archive:
https://einstein.computing.dcu.ie/res/files.zip.

You can download this file like this:

```
$ wget https://einstein.computing.dcu.ie/res/files.zip
```

Assume that the current working directory contains archive files.

7. Unpack a ZIP Archive: Write a shell script named wk1-unzip.sh to unpack the ZIP file files.zip.

   Tips: The `-q` option makes `unzip` silent.

8. Unpack a Tarball:
   A tarball is similar to a zip archive, except that tarballs are created and extracted using the tar utility.
   Here is a sample tarball:
   https://einstein.computing.dcu.ie/res/files.tgz .

   You can download this file like this:

   ```
   $ wget https://einstein.computing.dcu.ie/res/files.tgz
   ```

   Write a shell script named wk1-untar.sh to unpack the tarball files.tgz.

9. Unpack a Tarball Again:
   Again assume that the current working directory contains a compressed tarball named files.tgz.

   Write a shell script named wk1-untar-again.sh to unpack the tarball into a new directory named files.

10. Unpack a ZIP Archive Again:
    And again assume that the current working directory contains a ZIP file named files.zip.
    Also assume an existing environment variable named DIR.

    Write a shell script named wk1-unzip-again.sh to unpack the ZIP file files.zip into a new directory defined by the environment variable $DIR.

Searching for Lines with grep

Use grep (and its friends) for these tasks.

There is a test file here: https://einstein.computing.dcu.ie/res/mary.txt.

11. Find 'Mary' in Text: Write a shell script named wk1-marys.sh that copies each line containing 'Mary' in mary.txt to standard output.

12. Find the Word 'a': Write a shell script named wk1-mary-as.sh to copy each line containing the word 'a' from mary.txt. (Note: we're not looking for the character a here, but the whole word a.)

13. Find 'Mary' and 'Lamb': Write a shell script named wk1-mary-lambs.sh to copy each line containing both the words 'Mary' and 'lamb'.
    - Tip: Make the search case-insensitive.
    - Tip: One solution involves using a pipe.

Working with Numbers

14. Find Lines Containing '9': Write a shell script named wk1-nines.sh that copies lines containing '9' to standard output.
15. Find Lines Containing '9' from data.txt: Write a shell script named wk1-nines-again.sh that copies lines containing '9' from data.txt.
16. Find Lines Starting with '9': Write a shell script named wk1-starting-nines.sh to copy lines that start with '9'.
17. Find Lines Ending with '9': Write a shell script named wk1-ending-nines.sh to copy lines ending with '9'.

Word Processing

One Word Per Line: Write a shell script named wk1-one-word-per-line.sh that writes each word of the input to standard output on a separate line.

Example standard output

```
Mary
had
a
little
lamb,
.
.
.
```

- Tip: Consider using the tr utility.

Bonus Task

Solve the task named "secret-1.sh" on Einstein.

- Note: This task is not part of your CA for this week

If you solve this task, then great! But please do not circulate the solution; that would spoil it for your classmates.