Shell Topic 00: Input/Output Redirection and Pipes

Note 1. There are three principles of the *Unix Philosophy*:

1. Write programs that do one thing and do it well.
2. Write programs to work together.
3. Write programs to handle text streams, because that is a universal interface.

Redirection and pipes are the glue that makes the Unix philosophy work.

Note 2. The *output redirection operator* > takes the output of a program and saves it to a file. If the file already exists, the contents are overwritten. The *append operator* >> is like > but it appends instead of overwriting. The *input redirection operator* < opens a file and passes the contents as the input to a command. The *pipe* | takes the output of the previous command and sends it to the input of the subsequent command.

Problem 3. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ echo 'hello world' >> README
$ echo 'hola mundo' >> README
$ echo 'salve munde' >> README
$ cat README | grep 'hello'
```

Fraction of LLMs with correct answer: 17 / 19 = 0.89

Problem 4. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ echo 'hello world' >> README
$ echo 'hola mundo' >> README
$ echo 'salve munde' >> README
$ grep 'hello' < README
```

Fraction of LLMs with correct answer: 19 / 19 = 1.00

Problem 5. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ echo 'hello world' > README
$ echo 'hola mundo' >> README
$ echo 'salve munde' > README
$ cat README | grep 'hello'
```

Fraction of LLMs with correct answer: 6 / 19 = 0.32

Problem 6. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ echo 'hello world' >> README
$ echo 'hola mundo' >> README
$ echo 'salve munde' >> README
$ cat README | grep 'h'
```

Fraction of LLMs with correct answer: 17 / 19 = 0.89

Problem 7. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ echo 'hello world' >> README
$ echo 'hola mundo' >> README
$ echo 'salve munde' >> README
$ cat README | grep 'h' | wc -l
```

Fraction of LLMs with correct answer: 12 / 19 = 0.63

Problem 8. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ echo 'hello world' >> README
$ echo 'hola mundo' >> README
$ echo 'salve munde' >> README
$ cat README | grep 'h.*a'
```

Fraction of LLMs with correct answer: 7 / 19 = 0.37

Problem 9. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ echo 'hello world' >> README
$ echo 'hola mundo' >> README
$ echo 'salve munde' >> README
$ cat README | grep -E 'h|a'
```

Fraction of LLMs with correct answer: 13 / 19 = 0.68

Problem 10. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ touch hello_world
$ touch hola_mundo
$ touch salve_munde
$ ls | wc -l
```

Fraction of LLMs with correct answer: 17 / 19 = 0.89

Problem 11. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ touch hello_world
$ touch hola_mundo
$ touch salve_munde
$ ls | grep 'h.*a' | wc -l
```

Fraction of LLMs with correct answer: 7 / 19 = 0.37

Problem 12. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ touch hello_world
$ touch hola_mundo
$ touch salve_munde
$ ls | grep -E 'h|a' | wc -l
```

Fraction of LLMs with correct answer: 12 / 19 = 0.63

Problem 13. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ touch hello world
$ touch hola mundo
$ touch salve munde
$ ls | grep 'h.*a' | wc -l
```

Fraction of LLMs with correct answer: 5 / 19 = 0.26

Problem 14. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ touch hello world
$ touch hola mundo
$ touch salve munde
$ ls | grep -E 'h|a' | wc -l
```

Fraction of LLMs with correct answer: 9 / 19 = 0.47

Problem 15. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ touch hello world
$ touch hola mundo
$ touch salve munde
$ ls | grep 'h' | grep 'a' | wc -l
```

Fraction of LLMs with correct answer: 7 / 19 = 0.37

Note 16. The << operator creates a *heredoc*. This operators allows you to define a document "right here" in the shell (i.e. without creating the document on disk) to be passed to the command as input. The << operator is immediately followed by a string, and the heredoc is terminated when the exact same string appears on a line by itself. EOF (end of file) is the traditional choice of string, but other strings are also valid.

Problem 17. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > README <<EOF
hello world
hola mundo
salve munde
EOF
$ cat README | grep 'a' | wc -l
```

Fraction of LLMs with correct answer: 14 / 19 = 0.74

Problem 18. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > README <<EOF
hello world
hola mundo
salve munde
EOF hello world
EOF
$ cat README | grep 'h' | wc -l
```

Fraction of LLMs with correct answer: 10 / 19 = 0.53

Problem 19. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > README <<EOF
hello world
hola mundo
salve munde
EOF
$ cat README | grep 'h' | grep 'a' | wc -l
```

Fraction of LLMs with correct answer: 8 / 19 = 0.42

LLM Model Performance