Shell Topic 04: Conditional Expressions

Note 1. Like for loops, if statements have subtle interactions with the `$` operator and various types of quotation marks. In the shell, expressions are contained within square brackets `[ ]`, the operator `&&` is `and`, `||` is `or`, and `!` is `not`.

Problem 2. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<'EOF'
foo='hello'
if [ $foo = "hello" ]; then
    touch if
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 4 / 13 = 0.31

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<'EOF'
foo='hello'
if [ $foo != "hello" ]; then
    touch if
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 10 / 13 = 0.77

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<EOF
foo='hello'
if [ $foo = "hello" ]; then
    touch if
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 4 / 13 = 0.31

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<'EOF'
foo='hello world'
if [ $foo = "hello" ]; then
    touch if
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 10 / 13 = 0.77

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<'EOF'
foo='hello world'
if [ $foo = "hello" ]; then
    touch if
else
    touch else
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 5 / 13 = 0.38

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

Fraction of LLMs with correct answer: 13 / 13 = 1.00

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<EOF
foo='hello'
if [ "$foo" = "hello" ]; then
    touch if
elif [ "$foo" = "hola" ]; then
    touch elif
else
    touch else
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 1 / 13 = 0.08

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<EOF
foo='hello'
if [ "$foo" = "hello" ] || [ "$foo" = "hola" ]; then
    touch if
else
    touch else
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 7 / 13 = 0.54

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<'EOF'
foo='hello'
bar='salve'
if [ "$foo" = "hello" ] && [ "$bar" = "salve" ]; then
    touch if
else
    touch else
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 4 / 13 = 0.31

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<'EOF'
foo='hello'
bar='salve'
if true && [ "$bar" = "salve" ]; then
    touch if
else
    touch else
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 5 / 13 = 0.38

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<'EOF'
foo='hello'
bar='salve'
if false || ([ "$bar" = "salve" ] && true); then
    touch if
else
    touch else
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 5 / 13 = 0.38

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<'EOF'
foo='hello'
if ! [ $foo = "hello" ]; then
    touch if
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<'EOF'
foo='hello'
if ! [ $foo != "hello" ]; then
    touch if
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 4 / 13 = 0.31

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ cat > quiz.sh <<'EOF'
foo='hello'
bar='salve'
if ! true || [ "$bar" != "salve" ]; then
    touch if
else
    touch else
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 4 / 13 = 0.31

Note 16. Inline conditional statements are possible in most programming languages (including python), but they are particularly common in the shell. These statements take advantage of the *short circuiting* behavior of boolean operators. That is, the and operator `&&` only evaluates its second argument if the first argument is true, and the or operator `||` only evaluates its second argument if the first argument is false.

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ false || echo $foo > false
$ true || echo $foo > true
$ ls
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ false && echo $foo > false
$ true && echo $foo > true
$ ls
```

Fraction of LLMs with correct answer: 10 / 13 = 0.77

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ (false && echo $foo) > false
$ (true && echo $foo) > true
$ ls
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

Problem 20. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ [ "$foo" = 'hello' ] && echo $foo > false
$ ls
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Problem 21. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ [ "$foo" = 'hello' ] || echo $foo > false
$ ls
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Problem 22. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ foo='hola'
$ ! [ "$foo" = 'hello' ] || echo $foo > false
$ ls
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Note 23. All programs have an exit code associated with them that indicate whether the program succeeded (exit code 0) or failed (a non-zero value). Success is interpreted as true within boolean expressions, and failure is interpreted as false. The `grep` program succeeds whenever it finds a match for its regular expression in the input.
Many of the shell features we've observed above are special cases of the exit code behavior. The `true` and `false` commands are actually programs that always return 0 and 1 respectively. The `[` operator is just a normal executable program that interprets its command line arguments as a boolean expression and returns 0 if the expression is true and 1 otherwise.

Problem 24. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > logs <<EOF
INFO: blah
INFO: blah
ERROR: blah blah blah
INFO: blah
EOF
$ cat logs | grep 'ERROR' || echo 'hello world' > foo
$ ls
```

Fraction of LLMs with correct answer: 10 / 13 = 0.77

Problem 25. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > logs <<EOF
INFO: blah
INFO: blah
WARNING: blah blah blah
INFO: blah
EOF
$ cat logs | grep 'ERROR' || echo 'hello world' > foo
$ ls
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

Problem 26. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > logs <<EOF
INFO: blah
INFO: blah
WARNING: blah blah blah
INFO: blah
EOF
$ cat logs | grep 'ERROR' && echo 'hello world' > foo
$ ls
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Problem 27. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > logs <<EOF
INFO: blah
INFO: blah
ERROR: blah blah blah
INFO: blah
EOF
$ cat logs | grep 'ERROR' && echo 'hello world' > foo
$ ls
```

Fraction of LLMs with correct answer: 8 / 13 = 0.62

Problem 28. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > logs <<EOF
INFO: blah
INFO: blah
ERROR: blah blah blah
INFO: blah
EOF
$ cat logs | grep 'ERROR' > /dev/null && echo 'hello world' > foo
$ ls
```

Fraction of LLMs with correct answer: 10 / 13 = 0.77

Problem 29. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > logs <<EOF
INFO: blah
INFO: blah
ERROR: blah blah blah
INFO: blah
EOF
$ cat > quiz.sh <<'EOF'
if cat logs | grep ERROR > /dev/null; then
    touch if
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 9 / 13 = 0.69

Problem 30. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > logs <<EOF
INFO: blah
INFO: blah
WARNING: blah blah blah
INFO: blah
EOF
$ cat > quiz.sh <<'EOF'
if cat logs | grep ERROR > /dev/null; then
    touch error
elif cat logs | grep WARNING > /dev/null; then
    touch warning
elif cat logs | grep INFO > /dev/null; then
    touch info
fi
EOF
$ sh quiz.sh
$ ls
```

Fraction of LLMs with correct answer: 5 / 13 = 0.38

LLM Model Performance