

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.

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<'EOF'
4 foo='hello'
5 if [ $foo = "hello" ]; then
6     touch if
7 fi
8 EOF
9 $ sh quiz.sh
10 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<'EOF'
4 foo='hello'
5 if [ $foo != "hello" ]; then
6     touch if
7 fi
8 EOF
9 $ sh quiz.sh
10 $ ls
```

Fraction of LLMs with correct answer: $4 / 19 = 0.21$

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<EOF
4 foo='hello'
5 if [ $foo = "hello" ]; then
6     touch if
7 fi
8 EOF
9 $ sh quiz.sh
10 $ ls
```

Fraction of LLMs with correct answer: 0 / 19 = 0.00

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<'EOF'
4 foo='hello world'
5 if [ $foo = "hello" ]; then
6     touch if
7 fi
8 EOF
9 $ sh quiz.sh
10 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<'EOF'
4 foo='hello world'
5 if [ $foo = "hello" ]; then
6     touch if
7 else
8     touch else
9 fi
10 EOF
11 $ sh quiz.sh
12 $ ls
```

Fraction of LLMs with correct answer: 3 / 19 = 0.16

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<EOF
4 foo='hello'
5 if [ "$foo" = "hello" ]; then
6     touch if
7 elif [ "$foo" = "hola" ]; then
8     touch elif
9 else
10    touch else
11 fi
12 EOF
13 $ sh quiz.sh
14 $ ls
```

Fraction of LLMs with correct answer: $2 / 19 = 0.11$

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<EOF
4 foo='hello'
5 if [ "$foo" = "hello" ]; then
6     touch if
7 elif [ "$foo" = "hola" ]; then
8     touch elif
9 else
10    touch else
11 fi
12 EOF
13 $ sh quiz.sh
14 $ ls
```

Fraction of LLMs with correct answer: $2 / 19 = 0.11$

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<EOF
4 foo='hello'
5 if [ "$foo" = "hello" ] || [ "$foo" = "hola" ]; then
6     touch if
7 else
8     touch else
9 fi
10 EOF
11 $ sh quiz.sh
12 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<'EOF'
4 foo='hello'
5 bar='salve'
6 if [ "$foo" = "hello" ] && [ "$bar" = "salve" ]; then
7     touch if
8 else
9     touch else
10 fi
11 EOF
12 $ sh quiz.sh
13 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<'EOF'
4 foo='hello'
5 bar='salve'
6 if true && [ "$bar" = "salve" ]; then
7     touch if
8 else
9     touch else
10 fi
11 EOF
12 $ sh quiz.sh
13 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<'EOF'
4 foo='hello'
5 bar='salve'
6 if false || ([ "$bar" = "salve" ] && true); then
7     touch if
8 else
9     touch else
10 fi
11 EOF
12 $ sh quiz.sh
13 $ ls
```

Fraction of LLMs with correct answer: $3 / 19 = 0.16$

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<'EOF'
4 foo='hello'
5 if ! [ $foo = "hello" ]; then
6     touch if
7 fi
8 EOF
9 $ sh quiz.sh
10 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<'EOF'
4 foo='hello'
5 if ! [ $foo != "hello" ]; then
6     touch if
7 fi
8 EOF
9 $ sh quiz.sh
10 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ cat > quiz.sh <<'EOF'
4 foo='hello'
5 bar='salve'
6 if ! true || [ "$bar" != "salve" ]; then
7     touch if
8 else
9     touch else
10 fi
11 EOF
12 $ sh quiz.sh
13 $ ls
```

Fraction of LLMs with correct answer: 4 / 19 = 0.21

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.

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ false || echo $foo > false
4 $ true || echo $foo > true
5 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ false && echo $foo > false
4 $ true && echo $foo > true
5 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ (false && echo $foo) > false
4 $ (true && echo $foo) > true
5 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ [ "$foo" = 'hello' ] && echo $foo > false
4 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ [ "$foo" = 'hello' ] || echo $foo > false
4 $ ls
```

Fraction of LLMs with correct answer: 11 / 19 = 0.58

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ foo='hola'
3 $ ! [ "$foo" = 'hello' ] || echo $foo > false
4 $ ls
```

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ cat > logs <<EOF
3 INFO: blah
4 INFO: blah
5 ERROR: blah blah blah
6 INFO: blah
7 EOF
8 $ cat logs | grep 'ERROR' || echo 'hello world' > foo
9 $ ls
```

Fraction of LLMs with correct answer: 1 / 19 = 0.05

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ cat > logs <<EOF
3 INFO: blah
4 INFO: blah
5 WARNING: blah blah blah
6 INFO: blah
7 EOF
8 $ cat logs | grep 'ERROR' || echo 'hello world' > foo
9 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ cat > logs <<EOF
3 INFO: blah
4 INFO: blah
5 WARNING: blah blah blah
6 INFO: blah
7 EOF
8 $ cat logs | grep 'ERROR' && echo 'hello world' > foo
9 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ cat > logs <<EOF
3 INFO: blah
4 INFO: blah
5 ERROR: blah blah blah
6 INFO: blah
7 EOF
8 $ cat logs | grep 'ERROR' && echo 'hello world' > foo
9 $ ls
```

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

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ cat > logs <<EOF
3 INFO: blah
4 INFO: blah
5 ERROR: blah blah blah
6 INFO: blah
7 EOF
8 $ cat logs | grep 'ERROR' > /dev/null && echo 'hello world' > foo
9 $ ls
```

Fraction of LLMs with correct answer: 11 / 19 = 0.58

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ cat > logs <<EOF
3 INFO: blah
4 INFO: blah
5 ERROR: blah blah blah
6 INFO: blah
7 EOF
8 $ cat > quiz.sh <<'EOF'
9 if cat logs | grep ERROR > /dev/null; then
10     touch if
11 fi
12 EOF
13 $ sh quiz.sh
14 $ ls
```

Fraction of LLMs with correct answer: 11 / 19 = 0.58

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

```
1 $ cd; rm -rf quiz; mkdir quiz; cd quiz
2 $ cat > logs <<EOF
3 INFO: blah
4 INFO: blah
5 WARNING: blah blah blah
6 INFO: blah
7 EOF
8 $ cat > quiz.sh <<'EOF'
9 if cat logs | grep ERROR > /dev/null; then
10     touch error
11 elif cat logs | grep WARNING > /dev/null; then
12     touch warning
13 elif cat logs | grep INFO > /dev/null; then
14     touch info
15 fi
16 EOF
17 $ sh quiz.sh
18 $ ls
```

Fraction of LLMs with correct answer: $3 / 19 = 0.16$

LLM Model Performance

