

Quiz Practice: POSIX Shell 1

Note 1. I will generate new problems by: (1) changing the type of quotation mark, (2) removing/adding quotation marks.

1 If Statement

Problem 1. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
11 $
```

Passing LLMs: gemini-1.5-flash-001, groq-llama3.1-70b, o1-mini, o1-preview
Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
gemini-1.5-flash-8b-001, gemini-2.0-flash-exp,
gemini-2.0-flash-thinking-exp-1219, gpt-4, gpt-4o, gpt-4o-mini,
groq-llama3.1-8b

Problem 2. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: gemini-2.0-flash-exp, gpt-4o, groq-llama3.1-70b, o1-mini,
o1-preview
Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
gemini-2.0-flash-thinking-exp-1219, gpt-4, gpt-4o-mini,
groq-llama3.1-8b

Problem 3. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs:

Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
 gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
 gemini-2.0-flash-exp, gemini-2.0-flash-thinking-exp-1219,
 gpt-4, gpt-4o, gpt-4o-mini, groq-llama3.1-70b, groq-llama3.1-8b,
 o1-mini, o1-preview

Problem 4. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: claude-3-5-sonnet-20241022, gemini-2.0-flash-exp, gpt-4o,
 groq-llama3.1-70b, o1-mini, o1-preview

Failing LLMs: claude-3-5-haiku-latest, gemini-1.5-flash-001,
 gemini-1.5-flash-8b-001, gemini-2.0-flash-thinking-exp-1219,
 gpt-4, gpt-4o-mini, groq-llama3.1-8b

1.1 The Else And Elif Keywords

Problem 5. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: groq-llama3.1-70b, o1-mini, o1-preview

Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
gemini-2.0-flash-exp, gemini-2.0-flash-thinking-exp-1219,
gpt-4, gpt-4o, gpt-4o-mini, groq-llama3.1-8b

Problem 6. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs:

Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
gemini-2.0-flash-exp, gemini-2.0-flash-thinking-exp-1219,
gpt-4, gpt-4o, gpt-4o-mini, groq-llama3.1-70b, groq-llama3.1-8b,
o1-mini, o1-preview

Problem 7. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs:

Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
 gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
 gemini-2.0-flash-exp, gemini-2.0-flash-thinking-exp-1219,
 gpt-4, gpt-4o, gpt-4o-mini, groq-llama3.1-70b, groq-llama3.1-8b,
 o1-mini, o1-preview

1.2 Boolean Operations

Problem 8. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: groq-llama3.1-70b, o1-preview

Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
 gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
 gemini-2.0-flash-exp, gemini-2.0-flash-thinking-exp-1219,
 gpt-4, gpt-4o, gpt-4o-mini, groq-llama3.1-8b, o1-mini

Problem 9. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: o1-preview
Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
gemini-2.0-flash-exp, gemini-2.0-flash-thinking-exp-1219,
gpt-4, gpt-4o, gpt-4o-mini, groq-llama3.1-70b, groq-llama3.1-8b,
o1-mini

Problem 10. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: groq-llama3.1-70b, o1-preview
Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
gemini-2.0-flash-exp, gemini-2.0-flash-thinking-exp-1219,
gpt-4, gpt-4o, gpt-4o-mini, groq-llama3.1-8b, o1-mini

Problem 11. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: o1-mini, o1-preview
Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
gemini-2.0-flash-exp, gemini-2.0-flash-thinking-exp-1219,
gpt-4, gpt-4o, gpt-4o-mini, groq-llama3.1-70b, groq-llama3.1-8b

1.3 Not Operator

Problem 12. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: gemini-2.0-flash-exp, gpt-4o, groq-llama3.1-70b, o1-preview
Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
gemini-2.0-flash-thinking-exp-1219, gpt-4, gpt-4o-mini,
groq-llama3.1-8b, o1-mini

Problem 13. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: gemini-1.5-flash-001, groq-llama3.1-70b, o1-mini, o1-preview
Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
 gemini-1.5-flash-8b-001, gemini-2.0-flash-exp,
 gemini-2.0-flash-thinking-exp-1219, gpt-4, gpt-4o, gpt-4o-mini,
 groq-llama3.1-8b

Problem 14. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: groq-llama3.1-70b, o1-mini, o1-preview
Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
 gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
 gemini-2.0-flash-exp, gemini-2.0-flash-thinking-exp-1219,
 gpt-4, gpt-4o, gpt-4o-mini, groq-llama3.1-8b

2 Inline Conditions

Problem 15. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

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

Passing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022, gpt-4o,
 o1-mini, o1-preview

Failing LLMs: gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
 gemini-2.0-flash-exp, gemini-2.0-flash-thinking-exp-1219,
 gpt-4, gpt-4o-mini, groq-llama3.1-70b, groq-llama3.1-8b

Problem 16. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

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

Passing LLMs: claude-3-5-haiku-latest, gemini-1.5-flash-001,
 gemini-1.5-flash-8b-001, gemini-2.0-flash-exp, gpt-4o,
 gpt-4o-mini, o1-preview

Failing LLMs: claude-3-5-sonnet-20241022,
 gemini-2.0-flash-thinking-exp-1219, gpt-4, groq-llama3.1-70b,
 groq-llama3.1-8b, o1-mini

Problem 17. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

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

Passing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
 gemini-1.5-flash-001, gpt-4, gpt-4o, groq-llama3.1-70b, o1-mini,
 o1-preview

Failing LLMs: gemini-1.5-flash-8b-001, gemini-2.0-flash-exp,
 gemini-2.0-flash-thinking-exp-1219, gpt-4o-mini,
 groq-llama3.1-8b

Problem 18. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

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

Passing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
 gemini-2.0-flash-exp
Failing LLMs: gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
 gemini-2.0-flash-thinking-exp-1219, gpt-4, gpt-4o, gpt-4o-mini,
 groq-llama3.1-70b, groq-llama3.1-8b, o1-mini, o1-preview

Problem 19. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

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

Passing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
 gemini-1.5-flash-001, gemini-2.0-flash-exp, gpt-4, gpt-4o,
 gpt-4o-mini, o1-preview
Failing LLMs: gemini-1.5-flash-8b-001, gemini-2.0-flash-thinking-exp-1219,
 groq-llama3.1-70b, groq-llama3.1-8b, o1-mini

Problem 20. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

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

Passing LLMs: claude-3-5-haiku-latest, gpt-4o, o1-mini
Failing LLMs: claude-3-5-sonnet-20241022, gemini-1.5-flash-001,
 gemini-1.5-flash-8b-001, gemini-2.0-flash-exp,
 gemini-2.0-flash-thinking-exp-1219, gpt-4, gpt-4o-mini,
 groq-llama3.1-70b, groq-llama3.1-8b, o1-preview

3 Exit Codes

Problem 21. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: o1-preview
Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
gemini-2.0-flash-exp, gemini-2.0-flash-thinking-exp-1219,
gpt-4, gpt-4o, gpt-4o-mini, groq-llama3.1-70b, groq-llama3.1-8b,
o1-mini

Problem 22. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
gemini-1.5-flash-001, gemini-2.0-flash-exp, gpt-4, gpt-4o,
gpt-4o-mini, groq-llama3.1-70b, o1-preview
Failing LLMs: gemini-1.5-flash-8b-001, gemini-2.0-flash-thinking-exp-1219,
groq-llama3.1-8b, o1-mini

Problem 23. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: gemini-2.0-flash-exp, gpt-4o, gpt-4o-mini, groq-llama3.1-70b,
 o1-preview
Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
 gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
 gemini-2.0-flash-thinking-exp-1219, gpt-4, groq-llama3.1-8b,
 o1-mini

Problem 24. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
 gemini-1.5-flash-001, gemini-2.0-flash-exp, gpt-4, gpt-4o,
 gpt-4o-mini, groq-llama3.1-70b, o1-preview
Failing LLMs: gemini-1.5-flash-8b-001, gemini-2.0-flash-thinking-exp-1219,
 groq-llama3.1-8b, o1-mini

Problem 25. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
 gemini-1.5-flash-001, gemini-2.0-flash-exp, gpt-4,
 groq-llama3.1-70b, o1-mini, o1-preview
Failing LLMs: gemini-1.5-flash-8b-001, gemini-2.0-flash-thinking-exp-1219,
 gpt-4o, gpt-4o-mini, groq-llama3.1-8b

Problem 26. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: gemini-1.5-flash-001, gpt-4, gpt-4o, groq-llama3.1-70b,
 o1-preview
Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
 gemini-1.5-flash-8b-001, gemini-2.0-flash-exp,
 gemini-2.0-flash-thinking-exp-1219, gpt-4o-mini,
 groq-llama3.1-8b, o1-mini

Problem 27. Write the output of the final command in the following terminal session. Do not provide any additional information, such as explanations. If the command has no output, then do not write anything.

```
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
```

Passing LLMs: gpt-4o, o1-preview

Failing LLMs: claude-3-5-haiku-latest, claude-3-5-sonnet-20241022,
gemini-1.5-flash-001, gemini-1.5-flash-8b-001,
gemini-2.0-flash-exp, gemini-2.0-flash-thinking-exp-1219,
gpt-4, gpt-4o-mini, groq-llama3.1-70b, groq-llama3.1-8b, o1-mini

LLM Model Performance

