Shell Topic 02: Environment Variables

Note 1. Environment variables are a special type of variable whose value gets passed to all children of the shell. They are commonly used to store sensitive information like passwords or API keys. They can be created using the `export` keyword (which also creates a standard shell variable) or using *command prefix notation* (which does not create a standard shell variable).

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ message="hello world"
$ cat > quiz.sh <<EOF
echo $message
EOF
$ sh quiz.sh
```

Fraction of LLMs with correct answer: 18 / 19 = 0.95

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ message="hello world"
$ cat > quiz.sh <<'EOF'
echo $message
EOF
$ sh quiz.sh
```

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

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ message="hello world"
$ cat > quiz.sh <<EOF
echo '$message'
EOF
$ sh quiz.sh
```

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

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ export message="hello world"
$ cat > quiz.sh <<EOF
echo $message
EOF
$ sh quiz.sh
```

Fraction of LLMs with correct answer: 18 / 19 = 0.95

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ export message="hello world"
$ cat > quiz.sh <<'EOF'
echo $message
EOF
$ sh quiz.sh
```

Fraction of LLMs with correct answer: 16 / 19 = 0.84

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > quiz.sh <<EOF
echo $message
EOF
$ message="hello world" sh quiz.sh
```

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

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > quiz.sh <<'EOF'
echo $message
EOF
$ message="hello world" sh quiz.sh
```

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

Note 9. Variables never get passed from children to their parents. For a script to set a variable, the script must be *sourced*.

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ message="hello world"
$ cat > quiz.sh <<EOF
message="hola mundo"
EOF
$ sh quiz.sh
$ echo "$message"
```

Fraction of LLMs with correct answer: 16 / 19 = 0.84

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ message="hello world"
$ cat > quiz.sh <<EOF
message="hola mundo"
EOF
$ source quiz.sh
$ echo "$message"
```

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

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ message="hello world"
$ cat > quiz.sh <<EOF
export message="hola mundo"
EOF
$ sh quiz.sh
$ echo "$message"
```

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

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ message="hello world"
$ cat > quiz.sh <<EOF
export message="hola mundo"
EOF
$ . quiz.sh
$ echo "$message"
```

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

Note 14. In python, the function `os.getenv` is used to get the value of an environment variable. The first parameter is the name of the variable, and the second parameter is a default value to use if the environment variable has not been set.

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ cat > quiz.py <<'EOF'
import os
print(os.getenv('message', 'hola mundo'))
EOF
$ message="hello world" python3 quiz.py
```

Fraction of LLMs with correct answer: 15 / 19 = 0.79

Problem 16. Write the output of the final command in the following shell script.

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ message="hello world"
$ cat > quiz.py <<EOF
import os
print(os.getenv('message', 'hola mundo'))
EOF
$ python3 quiz.py
```

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

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ message="hello world"
$ cat > quiz.py <<'EOF'
import os
print(os.getenv('message', 'hola mundo'))
EOF
$ python3 quiz.py
```

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

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ export message="hello world"
$ cat > quiz.py <<EOF
import os
print(os.getenv('message', 'hola mundo'))
EOF
$ python3 quiz.py
```

Fraction of LLMs with correct answer: 18 / 19 = 0.95

Note 19. Forgetting quotation marks around a variable definition is a common syntax mistake that results in accidentally using the command prefix environment variable notation. The results are usually quite unexpected and difficult to debug.

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

```
$ cd; rm -rf quiz; mkdir quiz; cd quiz
$ var=echo echo echo
$ touch "$var"
$ ls | wc -l
```

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

LLM Model Performance