

### Question 6 (2024eb03003):

Please find screenshot of shell script below and attaching **metrics.sh** script to GitHub repository:

The screenshot shows a terminal window titled "som@linux-vm:~/Desktop". Inside the terminal, the "metrics.sh" script is displayed in the nano editor. The script performs several steps to calculate word metrics from an input file ("input.txt"). It checks if the file exists, normalizes the text (lowercase, remove punctuation), finds the longest word, shortest word, average word length, and unique word count. Finally, it prints the results. The terminal also shows the nano editor's status bar at the bottom.

```
GNU nano 7.2 metrics.sh
#!/bin/bash

# Check if input file exists
INPUT_FILE="input.txt"

if [ ! -f "$INPUT_FILE" ]; then
    echo "Error: File '$INPUT_FILE' does not exist."
    exit 1
fi

# Normalize text: lowercase, remove punctuation, one word per line
WORDS=$(tr '[:upper:]' '[:lower:]' < "$INPUT_FILE" \
    | tr -cd '[:alnum:][:space:]'\n' \
    | tr '\n' '\n')

# Longest word
LONGEST=$(echo "$WORDS" | awk '{ print length, $0 }' | sort -nr | head -1 | awk '{print $2}')

# Shortest word
SHORTEST=$(echo "$WORDS" | awk '{ print length, $0 }' | sort -n | head -1 | awk '{print $2}')

# Average word length
AVG_LENGTH=$(echo "$WORDS" | awk '{ sum+=length; count++ } END { if(count>0) print sum/count; else print 0 }')

# Total number of unique words
UNIQUE_COUNT=$(echo "$WORDS" | sort | uniq | wc -l)

# Display metrics
echo "Text Metrics for '$INPUT_FILE'"
echo "-----"
echo "Longest word      : $LONGEST"
echo "Shortest word     : $SHORTEST"
echo "Average word length: $AVG_LENGTH"
echo "Unique words count : $UNIQUE_COUNT"
```

^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo  
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo

### Testing the metrics.sh Script

#### Test Case:

Create **input.txt** with mixed word lengths/duplicates, ran ./metrics.sh to verify tr|sort|uniq|wc pipelines correctly computed all 4 metrics using only required pipe commands, confirming requirements without loops/arrays.

```
echo "Linux is fast, secure, and powerful. Linux powers servers, desktops, and devices! Secure
systems rely on Linux." > input.txt
```

```
som@linux-vm:~/Desktop$ echo "Linux is fast, secure, and powerful. Linux powers servers, desktops, and devices! Secure systems rely on Linux." > input.txt
```

The **metrics.sh** accurately analyzes **input.txt** using only required pipe commands (tr, sort, uniq, wc), correctly handling duplicates, case-insensitivity, and word length extremes. All 4 metrics proven correct for the Linux text input, meeting requirements without loops/arrays.

```
som@linux-vm:~/Desktop$ ./metrics.sh
Text Metrics for 'input.txt'
-----
Longest word      : powerful
Shortest word     : is
Average word length: 5.17647
Unique words count : 13
som@linux-vm:~/Desktop$
```

- Longest / shortest word: exact letters only → matches
- Average word length: counts only letters, no punctuation → slight difference from manual eyeball calculation
- Unique words: works perfectly