Breaking the Imitation Game: Can LLMs Fool Humans and Machines Alike?

I. Example of Prompts

A. Basic Prompt

Table I shows an example of a basic prompt.

B. Moderate Prompt

Table II shows an example of a moderate prompt.

C. Fine-grained Prompt

Table III shows an example of a fine-grained prompt.

TABLE I
BASIC PROMPT

Task: You are an imitator designed to replicate the writing style of the human author. Your task is to generate {Number} tweets on {Topic}. Do not add any additional information, such as a Tweet#. This task is part of a study to evaluate your capabilities in mimicking human writing styles accurately using the given instructions. If possible, reflect the style instructions in the output to your own ability with full consideration.
Instructions:
1. **Number of Total Characters:** Include an average of 86.2 characters per text with a standard deviation (STD) of approximately 53.45.
2. **Number of Uppercase Characters:** Include about 10.6 uppercase characters on average with a STD of 7.45.
3. **Number of Lowercase Characters:** Ensure roughly 50 lowercase characters per text, with a STD of 33.89.
4. **Number of Special Characters:** Integrate about 11.2 special characters per text to enhance textual diversity with an STD of 5.23.
5. **Number of Numbers:** Feature approximately 2.6 numerical characters per text, with a STD of 1.2.
6. **Number of Blanks:** Maintain about 11.8 spaces in each text to facilitate readability, with a STD of 9.77.
7. **Number of Words:** Construct texts with around 12.2 words, with a STD of 9.35.
8. **Average Length of Words:** Target an average word length of 2.89 characters with an STD of 2.38.
9. **Number of Propositions:** Include roughly 1.2 propositions per text, with a STD of 0.4.
10. **Average Length of Propositions:** Use an average proposition length of 10.5 characters with a STD of 9.09.
11. **Number of Punctuation Characters:** Use about 5 punctuation marks per text, with a STD of 3.35.
12. **Number of Lowercase Words:** Include approximately 8.4 lowercase words per text, with a STD of 6.44.
13. **Number of Uppercase Words:** Include about 1.2 uppercase words per text, with a STD of 1.17.
14. **Vocabulary Richness:** Maintain a vocabulary richness mean of 0.948 with a STD of 0.074.
15. **Flesch-Kincaid Grade Level:** Aim for a mean grade level of 15.54 with a STD of 13.63.
16. **Flesch Reading Ease:** Use a mean score of -1.35 with a STD of 107.7.
17. **Dale-Chall Readability Score:** Aim for a mean score of 33.656, with a STD of 27.12.
18. **Automated Readability Index (ARI):** Target a mean of 39.74, with a STD of 35.22.
19. **Coleman-Liau Index:** Maintain a mean index of 27.326 with a STD of 21.25.
20. **Gunning Fog Index:** Aim for a mean score of about 11.76, with a STD of 14.65.
21. **SMOG Index:** Target a Simple Measure of Gobbledygook (SMOG) mean of 0, with a STD of 0.
22. **Linsear Write:** Aim for a mean score of about 4.65 with a STD of 4.76.
Output Indicator: Your output should be crafted to effectively engage readers. Ensure the content adheres to the stylistic and readability guidelines provided and reflects the distinct styles of the author's writing.

TABLE II
MODERATE PROMPT

Task: You are an imitator designed to replicate the writing style of the human author. Your task is to generate number tweets on Topic. Do not add any additional information, such as a Tweet#. This task is part of a study to evaluate your capabilities in mimicking human writing styles accurately using the given instructions. If possible, reflect the style instructions in the output to your own ability with full consideration.
Instructions:
1. **Number of Total Characters:** Aim for a standard deviation of 7.52 characters per text. This suggests that while the average length might vary, texts should stay within this range of variation to maintain consistency.
2. **Number of Uppercase Characters :** Include an average of 6 uppercase (capital) letters per text. The standard deviation for uppercase characters is 2.35, indicating variability in the number of uppercase letters used.
3. **Number of Lowercase Characters:** Aim for a standard deviation of 8.22 lowercase characters per text. This indicates moderate variability in the number of lowercase letters used in each text.
4. **Number of Special Characters:** The standard deviation for special characters is 0.83, suggesting minimal variability in the use of punctuation marks and symbols.
5. **Number of Numbers:** Include an average of 0 numerical (number) characters per text. Aim for a standard deviation of 0 numerical characters per text, indicating minimal variability in the use of numbers.
6. **Number of Blanks:** Include an average of 8.25 blank spaces (spaces) per text. Maintain a standard deviation of 0.83 spaces per text. Spaces between words help organize thoughts and improve readability by effectively separating ideas.
7. **Number of Words:** Aim for an average of 8.75 words per text. Aim for a standard deviation of 1.09 words per text. This ensures the text provides sufficient information without becoming overly lengthy, while allowing for some variability in word count.
8. **Average Length of Words:** Target an average word length of 5.95 characters. Using a mix of shorter and longer words helps maintain reader interest and clarity.
9. **Number of Propositions:** Include an average of 1.25 propositions per text. Aim for an average proposition length of 7.75 characters. This ensures each proposition is clear and contributes meaningfully to the text's structure and flow. Aim for a standard deviation of 1.92 characters, indicating variability in the length of propositions used.
10. **Number of Punctuation Characters:** Include an average of 2 punctuation characters (special characters) per text. Aim for a standard deviation of 0.71 punctuation characters per text, indicating variability in the use of punctuation marks.
11. **Number of Lowercase Words:** Include an average of 5.75 lowercase words per text. Aim for a standard deviation of 1.79 lowercase words per text, indicating variability in the number of lowercase words used.
12. **Number of Uppercase Words:** Include an average of 1.25 uppercase word per text. Aim for a standard deviation of 0.43 uppercase words per text, indicating minimal variability in the use of uppercase words.
13. **Flesch-Kincaid Grade Level:** Aim for an average grade level of 2.88, indicating readability suitable for a general audience. This metric assesses text complexity based on sentence length and word difficulty.
14. **Flesch Reading Ease:** Strive for a score around 90.09, indicating very easy readability. Higher scores suggest simpler text that is more accessible and enjoyable to read.
15. **Dale-Chall Readability Score:** Aim for a standard deviation of 1.29. This score evaluates text difficulty based on common words, with higher scores indicating more complex vocabulary.
16. **Automated Readability Index (ARI):** Aim for an average ARI score of 5.9, indicating readability suitable for general readers. Aim for a standard deviation of 1.67, indicating variability in readability suitable for general readers.
17. **Coleman-Liau Index:** Aim for an average Coleman-Liau Index score of 7.42, indicating readability suitable for a general audience. Aim for a standard deviation of 1.59, indicating variability in text difficulty based on characters and sentences per word.
18. **Gunning Fog Index:** Aim for a mean score of about 4.61, indicating simpler text suitable for a broad audience. This index estimates the educational level needed to understand the text.
19. **Linsear Write:** Aim for a standard deviation of 0.74, indicating variability in readability suitable for intermediate readers. This formula evaluates text complexity based on sentence structure and word difficulty.
Output Indicator: Your output should be crafted to effectively engage readers. Ensure the content adheres to the stylistic and readability guidelines provided and reflects the distinct styles of the author's writing.

TABLE III
FINE-GRAINED PROMPT

Task: You are an imitator designed to replicate the writing style of the human author. Your task is to generate {Number} tweets on {Topic}. Do not add any additional information, such as a Tweet#. This task is part of a study to evaluate your capabilities in mimicking human writing styles accurately using the given instructions. If possible, reflect the style instructions in the output to your own ability with full consideration.

Instructions:

1. **Number of Total Characters:** Each post should include a total of 84 characters to maintain a post's text length. This count includes all uppercase letters, lowercase letters, special characters, numbers, and blank spaces.

2. **Number of Uppercase Characters:** Each post should include 10 uppercase characters. Uppercase characters are the capital letters from A to Z. For example: "HELLO WORLD" is a sample text with uppercase letters.

3. **Number of Lowercase Characters:** Each post must include 51 lowercase characters. Lowercase characters are the small letters from a to z. For example: "hello world" is a sample text with lowercase letters.

4. **Number of Special Characters:** Each post should include 9 special characters to denote various symbols. Special characters include symbols such as !, @, #, $, %, ^, &, *, (,), −, _, +, =, {, }, [,], :, ;, ", ′, <, >, ., ?, /, ,, |, and ¯.

5. **Number of Numbers:** Each post should include 3 numerical characters. Numerical characters are digits from 0 to 9.

6. **Number of Blanks:** Each post should include 13 spaces. Blank spaces represent the spaces between words. For example, there are eight blank spaces in the following text: "This is an example sentence that has blank spaces."

7. **Number of Words:** Each post should contain 14 words. Word represent a unit of writing text language and convey some meaning. For example: "This is a sample text." This sentence has five words.

8. **Average Length of Words:** Target a word length of about 8 characters. For example, "compulsory" is a word with ten characters, while "sample" is a word with six characters, averaging them provide us the target average length of words.

9. **Number of Propositions:** Include 1 proposition per post. A proposition is a statement that expresses an opinion, or idea. It can be part of a sentence or a complete sentence itself. For example, "Learning is essential for personal growth." is a proposition.

10. **Average Length of Propositions:** Include 14 average propositions per post. To calculate the average length of propositions, we need to identify propositions, count and sum the words or characters, and compute the average length by dividing the total by the number of propositions.

11. **Number of Punctuation Characters:** Each post should include 5 punctuation marks. Punctuation characters include symbols such as ., ,, !, ?, :, ;, ', ", -, used to separate sentences or parts of sentences and to clarify meaning.

12. **Number of Lowercase Words:** Include 6 lowercase words per post. Lowercase words are composed entirely of lowercase letters such as "this", "is", "they" are the example of lowercase words in a sentence.

13. **Number of Uppercase Words:** Include 2 uppercase words per post. Uppercase words are composed entirely of uppercase letters such as "THIS", "IT", "THEY" are the example of uppercase words.

14. **Number of Bigrams:** Each post should include 17 bigrams. Bigrams are pairs of consecutive words such as "This is", "is an", "an example", "example of", represent examples of bigrams.

15. **Number of Trigrams:** Each post should include 16 trigrams. Trigrams are groups of three consecutive words such as "This is an", "is an example", "an example of", represents an example of trigrams.

16. **Hapax Token Ratio (HTR):** Aim for a score of 1 to measure vocabulary diversity. HTR is the ratio of words that appear exactly once in a text. The following formula calculates the HTR. Calculation of HTR: In "hello world hello," "world" is a hapax, giving an HTR of 0.33.

17. **Vocabulary Richness:** Maintain a richness score of 1. Vocabulary richness measures the diversity of words used in the text. The following formula calculates the vocabulary richness. Calculation formula: The number of unique words divided by the total number of words in a text.

18. **Flesch-Kincaid Grade Level:** Aim for a grade level of 4. This score indicates the U.S. school grade level required to understand the text. Calculation formula: $0.39 \times (E) + 11.8 \times (G) - 15.59$, where G is the average number of syllables per word, while E is the average number of words per proposition.

19. **Flesch Reading Ease:** Use a score of 77. This score measures how easy a text is to read, with higher scores indicating easier readability. The calculation formula is: 206.835 - 84.6G - 1.015E, where G is the average number of syllables per word, and E is the average number of words per proposition.

20. **Dale-Chall Readability Score:** Aim for a score of 13. This score uses a list of familiar words to gauge text difficulty. The calculation formula is: 0.1579 * PDW + 0.0496 * ASL

21. **Automated Readability Index (ARI):** Target a mean of 7. This index estimates the U.S. grade level required to understand the text. Calculation formula: $4.71 \times$ (total characters / number of words) $+ 0.5 \times$ (number of words/ Number of Propositions) $- 21.43$.

22. **Coleman-Liau Index:** Maintain an index of 7. This index uses characters instead of syllables to assess readability. The calculation formula is:

$$0.0588 \times L - 0.296 \times S - 15.8$$

where L represents the average number of letters per 100 words, and S represents the average number of sentences per 100 words.

23. **Gunning Fog Index:** Aim for a score of about 9. The calculation formula is:

$$0.4 \times \left(\frac{W}{P} + 100 \times \frac{DW}{W} \right)$$

where W is the total number of words, P is the total number of sentences, and DW is the total number of difficult words.

24. **SMOG Index:** Target a Simple Measure of Gobbledygook (SMOG) of 5. This index measures the readability of a text based on the number of complex words. Polysyllabic words are defined as those containing three or more syllables. The calculation formula is:

$$1.0430 \times \sqrt{\text{number of polysyllabic words} \times \left(\frac{30}{\text{number of propositions}} \right)} + 3.1291$$

25. **Linsear Write:** Aim for a mean score of about 4. This formula estimates the U.S. grade level required to understand the text. It uses the number of syllables in words to determine their difficulty and computes a readability score based on these values. Here is a step-by-step breakdown of how to compute the value for this formula. 1). For each short word (two or fewer syllables), add 1 to the index. While for each long word (more than two syllables), add 3 to the index. 2). Sum the index values for all words in the text. 3). Divide the total index by the number of propositions in the text. 4). If the resulting value is more than 20, divide it by 2, otherwise, if the resulting value is 20 or less, divide it by 2 and then subtract 1. 5). Finally, we get the Linsear write score.

Output Indicator: Your output should be crafted to effectively engage readers. Ensure the content adheres to the stylistic and readability guidelines provided and reflects the distinct styles of the author's writing.