

Large Language Models

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CIA-1_Q2: Poem Generator using prompts.

Enrollment Number: 2448531

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Objective: To create a poem generator using 3 different models and compare their outputs.

Models Used: llama3-70b-8192, qwen/qwen3-32b, mistral-saba-24b

Architecture:

(i) llama3-70b-8192:-

Type: Transformer-based decoder-only architecture

Model Size: 70 billion parameters

Context Length: 8192 tokens

Layers: 24 decoder layers

Attention Heads: 16 attention heads per layer

Embeddings: 8192-dimensional token embeddings

Activation Functions: SwiGLU (Switchable Gated Linear Unit) activation functions

Optimization: Adam optimizer with learning rate schedule

(ii) qwen/qwen3-32b:-

Type: Transformer-based encoder-decoder architecture

Model Size: 32 billion parameters

Context Length: 2048 tokens

Layers: 24 encoder layers and 24 decoder layers

Attention Heads: 8 attention heads per layer

Embeddings: 2048-dimensional token embeddings

Activation Functions: Gated Linear Unit (GLU) activation functions

Optimization: Adam optimizer with learning rate schedule

(iii) mistral-saba-24b:-

Type: Transformer-based decoder-only architecture

Model Size: 24 billion parameters

Context Length: 2048 tokens

Layers: 24 decoder layers

Attention Heads: 8 attention heads per layer

Embeddings: 2048-dimensional token embeddings

Activation Functions: SwiGLU (Switchable Gated Linear Unit) activation functions

Optimization: AdamW optimizer with learning rate schedule

Implementation:
(i)llama3-70b-8192:-

Poem Generator using LLMs

Choose a model:
llama3-70b-8192

Enter your poem prompt...
Write a poem about nature

Temperature (0.1 - 1.5):
0.10 0.80 1.50

Top P (0.1 - 1.0):
0.10 0.90 1.00

Max Length (50-2000 tokens):
50 700 2000

Presence Penalty (0.0 - 2.0):
0.00 0.20 2.00

Generate Poem

Generated Poem:

Whispers of the Wildwood's Heart

In twilight's hush, where shadows play, The forest awakens, come what may. The trees, like sentinels of old, Stand guard, their whispers stories to be told.

The wind, a wanderer, whispers low, Secrets of the ages, as the leaves do grow. The rustle of their gentle sway, A lullaby to end each day.

The river's voice, a melodic flow, Echoes through the valleys, long ago. Its waters dance, a shimmering veil, Reflecting sunbeams, in a misty gale.

The mountains rise, a majestic throne, Where eagles soar, and wisdom is sown. Their ancient stones, a testament of time, A chronicle of secrets, sublime.

In nature's heart, a rhythm beats, A symphony of life, that wild and sweet. A harmony of earth and sky, A

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In nature's heart, a rhythm beats, A symphony of life, that wild and sweet. A harmony of earth and sky, A celestial music, passing by.

As sunset's embers, fade to gray, The stars appear, in a twinkling array. The night's dark veil, a mystery to keep, A promise of tomorrow, in its gentle sleep.

In this wild tapestry, I find my place, A thread of wonder, in nature's sacred space. A sense of awe, that whispers low, "I am a part of this, and it is a part of me, you know."

BLEU Score: 9.02 (compared to reference poem)

Poem Generator using LLMs

Choose a model:
qwen/qwen3-32b

Enter your poem prompt...
Write a poem about nature

Temperature (0.1 – 1.5):
0.10 0.80 1.50

Top P (0.1 – 1.0):
0.10 0.90 1.00

Max Length (50–2000 tokens):
50 700 2000

Presence Penalty (0.0 – 2.0):
0.00 0.20 2.00

Generate Poem

Generated Poem:

<think> Okay, the user wants a poem about nature. Let me start by thinking about the key elements of nature that are poetic. Maybe seasons, landscapes, elements like trees, rivers, mountains. I should use vivid imagery to evoke emotions. First, maybe start with a morning scene. Dawn is a good time because it's full of imagery like mist, sunrise. Personifying nature could add depth. Words like "whispers" or "songs" might work.

Next, think about different aspects of nature. Forests, oceans, mountains. Each has its own characteristics. Forests could be described as ancient or wise. Oceans as restless or deep. Mountains as timeless sentinels.

Incorporate elements that show the cycle of life. Maybe seasons changing, growth and decay. Use metaphors like leaves as letters or roots as memories. That adds a layer of meaning.

Whispers of the Earth

At dawn, the mist ascends like prayer,
a silver veil on morning's breath,
while rivers hum in tones of blue,
their liquid psalms of life and death.

The pines, with needles stitched in time,
keep ancient secrets in their knots,
and every breeze that stirs the boughs
carries the scent of roots and moss.

Mountains rise, unyielding, old—
their granite bones, a cradle's arm—
to cradle storms, to watch the world
spin wild in dusk's untempered calm.

The meadow pulses, heart untamed,
with fireflies scribbling fleeting trails,
while shadows waltz on moonlit lakes,
and crickets spin their lullabies.

Yet in the hush between the beats—
the rustle of a fern, the owl's soft cry—
the earth exhales a quiet truth:
we are its guests, not its demise.

So let us walk with lighter steps,
our hands unclenched, our souls unbound,
for every leaf, in its fall or climb,
is a verse in nature's boundless song.

BLEU Score: 0.56 (compared to reference poem)

Human Evaluation

Coherence (1–5)
1 3 5

Creativity (1–5)
1 4 5

Fluency (1–5)
1 3 5

Poem Generator using LLMs

Choose a model:

mistral-saba-24b

Enter your poem prompt...

Write a poem about nature

Temperature (0.1 - 1.5):

0.100.801.50

Top P (0.1 - 1.0):

0.100.901.00

Max Length (50-2000 tokens):

507002000

Presence Penalty (0.0 - 2.0):

0.000.202.00

Generate Poem

Generated Poem:

In the quiet of the dawn's first light, Nature whispers secrets in the night. The trees stand tall, in silence deep, Their roots entwined, in earth they weep.

The river's song, a lullaby, Beneath the sky, so vast and high. It weaves a tale of life and death, In every wave, a story's breath.

The mountains, giants of the earth, Their peaks kiss clouds that softly burst. They bear the scars of ancient times, In silent strength, they stand sublime.

The forests, vast and green, they stretch, A canvas painted green, no two leaves match. Each creature finds a home within, A secret world, where life begins.

The flowers bloom in colors bright, A beacon for the day's pure light. They dance with bees and butterflies, In nature's dance, they intertwine.

The animals, both great and small, Each plays its part, one and all. From tiny ants to elephants vast, They move through life, at nature's cast.

The river's song, a lullaby, Beneath the sky, so vast and high. It weaves a tale of life and death, In every wave, a story's breath.

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The animals, both great and small, Each plays its part, one and all. From tiny ants to elephants vast, They move through life, at nature's cast.

The sun sets low, a fiery ball, As day surrenders to the night's call. The stars above, in patterns new, Illuminating skies anew.

And so the cycle turns anew, In nature's womb, life's song is true. A symphony of life unfurls, In every leaf, in every pearl.

So let us stand in awe and wonder, At nature's beauty, pure and tender. For in its heart, we find our own, In every sunrise, every dawn.

BLEU Score: 4.9 (compared to reference poem)

Human Evaluation

Coherence (1-5)

135

Creativity (1-5)

145

Fluency (1-5)

135

Evaluation Summary

- Coherence: 3/5
- Creativity: 4/5
- Fluency: 3/5
- BLEU Score: 4.9

Different Prompt for all 3 models:
(i)llama3-70b-8192:-

Poem Generator using LLMs

Choose a model:

llama3-70b-8192



Enter your poem prompt...

Write a poem about friendship.

Temperature (0.1 – 1.5):



Top P (0.1 – 1.0):



Max Length (50–2000 tokens):



Presence Penalty (0.0 – 2.0):



Generate Poem

Generated Poem:

A bond of hearts, a tie so strong, A friendship formed, where love does belong. Through laughter and tears, through every test, Together you stand, and forever rest.

Like threads of gold, your hearts entwine, A tapestry rich, with memories divine. Shared secrets, whispers in the night, A trust so deep, a beacon shining bright.

In times of need, a helping hand, A listening ear, a understanding stand. Through life's joys and sorrows, you'll find, A friend by your side, a heart and mind.

Like branches swaying, in the breeze of life, Your bond will flex, but never strife. For in the roots of friendship, deep and true, A love will grow, forever shining through.

So cherish this gift, this treasure rare, A friendship pure, a love beyond compare. For in the garden of life, it's a bloom so bright, A flower of friendship, that will forever take flight.

BLEU Score: 3.38 (compared to reference poem)

Generated Poem:

A bond of hearts, a tie so strong, A friendship formed, where love does belong. Through laughter and tears, through every test, Together you stand, and forever rest.

Like threads of gold, your hearts entwine, A tapestry rich, with memories divine. Shared secrets, whispers in the night, A trust so deep, a beacon shining bright.

In times of need, a helping hand, A listening ear, a understanding stand. Through life's joys and sorrows, you'll find, A friend by your side, a heart and mind.

Like branches swaying, in the breeze of life, Your bond will flex, but never strife. For in the roots of friendship, deep and true, A love will grow, forever shining through.

So cherish this gift, this treasure rare, A friendship pure, a love beyond compare. For in the garden of life, it's a bloom so bright, A flower of friendship, that will forever take flight.

BLEU Score: 3.38 (compared to reference poem)

Human Evaluation



Evaluation Summary

- Coherence: 3/5
- Creativity: 4/5
- Fluency: 3/5
- BLEU Score: 3.38

(iii)mistral-saba-24b:-

Poem Generator using LLMs

Choose a model:

mistral-saba-24b

Enter your poem prompt...

Write a poem about friendship.

Temperature (0.1 – 1.5):



Top P (0.1 – 1.0):



Max Length (50–2000 tokens):



Presence Penalty (0.0 – 2.0):



Generate Poem

Generated Poem:

In the garden of life, where the sunbeams play, There grows a bond, both strong and fair, A friendship true, in every way, A treasure rare, beyond compare.

Two hearts entwined, like vines that climb, In joy and strife, in sun and rain, Through every season, side by side, A bond that's true, beyond restraint.

In laughter's echo, in tears' soft sigh, In secrets shared, in dreams held high, A friendship pure, a beacon bright, Guiding through the darkest night.

Through trials hard and days of cheer, A friend is there, year after year, With words of wisdom, hand outstretched, A friendship strong, a bond well-fetched.

So here's to friends, both old and new, To those who stand, to those who knew, The power of a bond so true, A friendship everlasting, me and you.

BLEU Score: 2.49 (compared to reference poem)

Components:

- **Temperature:** A hyperparameter that controls the randomness or uncertainty of the generated text. It is a value between 0 and 1 that determines the probability distribution over the possible next tokens.
- **Top_p (Nucleus Sampling):** It is a text generation technique that modifies the probability distribution over the possible next tokens in the sequence. Instead of sampling from the entire vocabulary, top-p sampling only considers the top p-percentile of tokens with the highest probabilities.
- **max_tokens:** Maximum number of tokens or words the model can generate.
- **presence_penalty:** The model will reduce the probability of generating a token that has already been generated in the sequence.