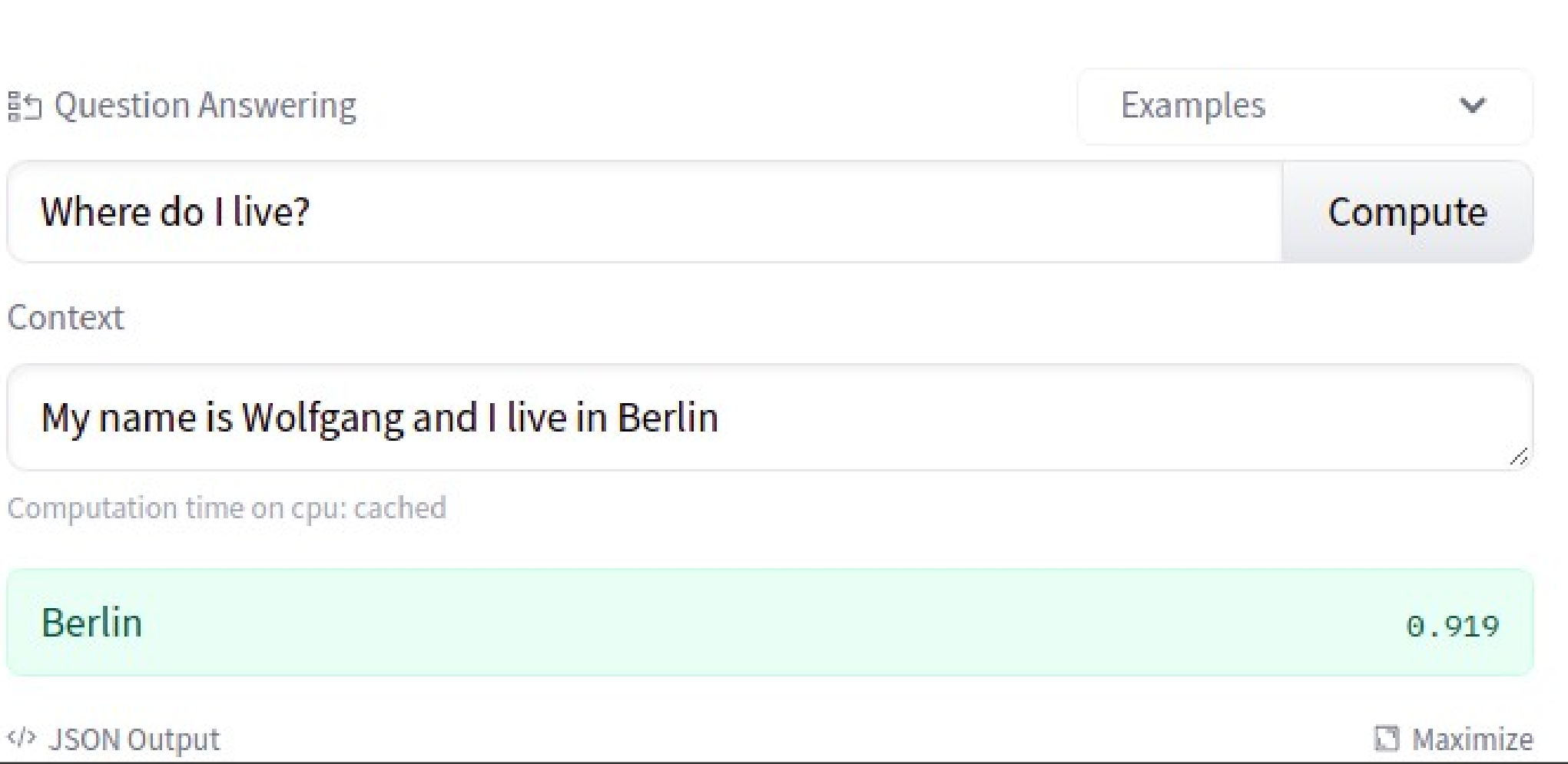
CMPE 353 AI

Last words...

AI
TASKS


Question Answering
Examples
Where do I live?
Compute
Context
My name is Wolfgang and I live in Berlin
Computation time on cpu: cached
Berlin
0.919
JSON Output
Maximize

Q/A

Summarization

Examples

The tower is 324 metres (1,063 ft) tall, about the same height as an 81-storey building, and the tallest structure in Paris. Its base is square, measuring 125 metres (410 ft) on each side. During its construction, the Eiffel Tower surpassed the Washington Monument to become the tallest man-made structure in the world, a title it held for 41 years until the Chrysler Building in New York City was finished in 1930. It was the first structure to reach a height of 300 metres. Due to the addition of a broadcasting aerial at the top of the tower in 1957, it is now taller than the Chrysler Building by 5.2 metres (17 ft). Excluding transmitters, the Eiffel Tower is the second tallest free-standing structure in France after the Millau Viaduct.

Compute

Computation time on cpu: cached

The tower is 324 metres (1,063 ft) tall, about the same height as an 81-storey building. Its base is square, measuring 125 metres (410 ft) on each side. During its construction, the Eiffel Tower surpassed the Washington Monument to become the tallest man-made structure in the world.

JSON Output

Maximize

Summarization

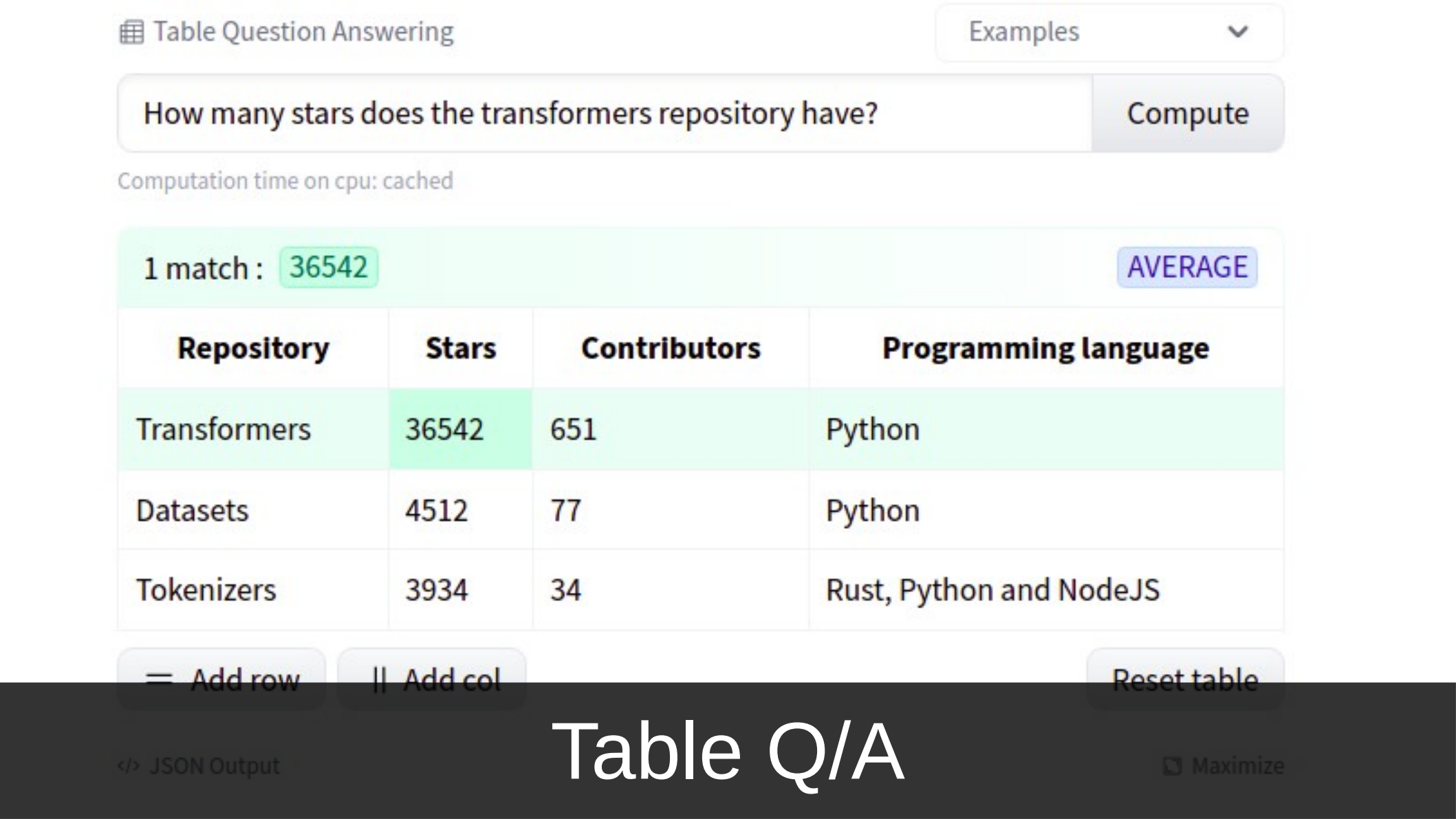
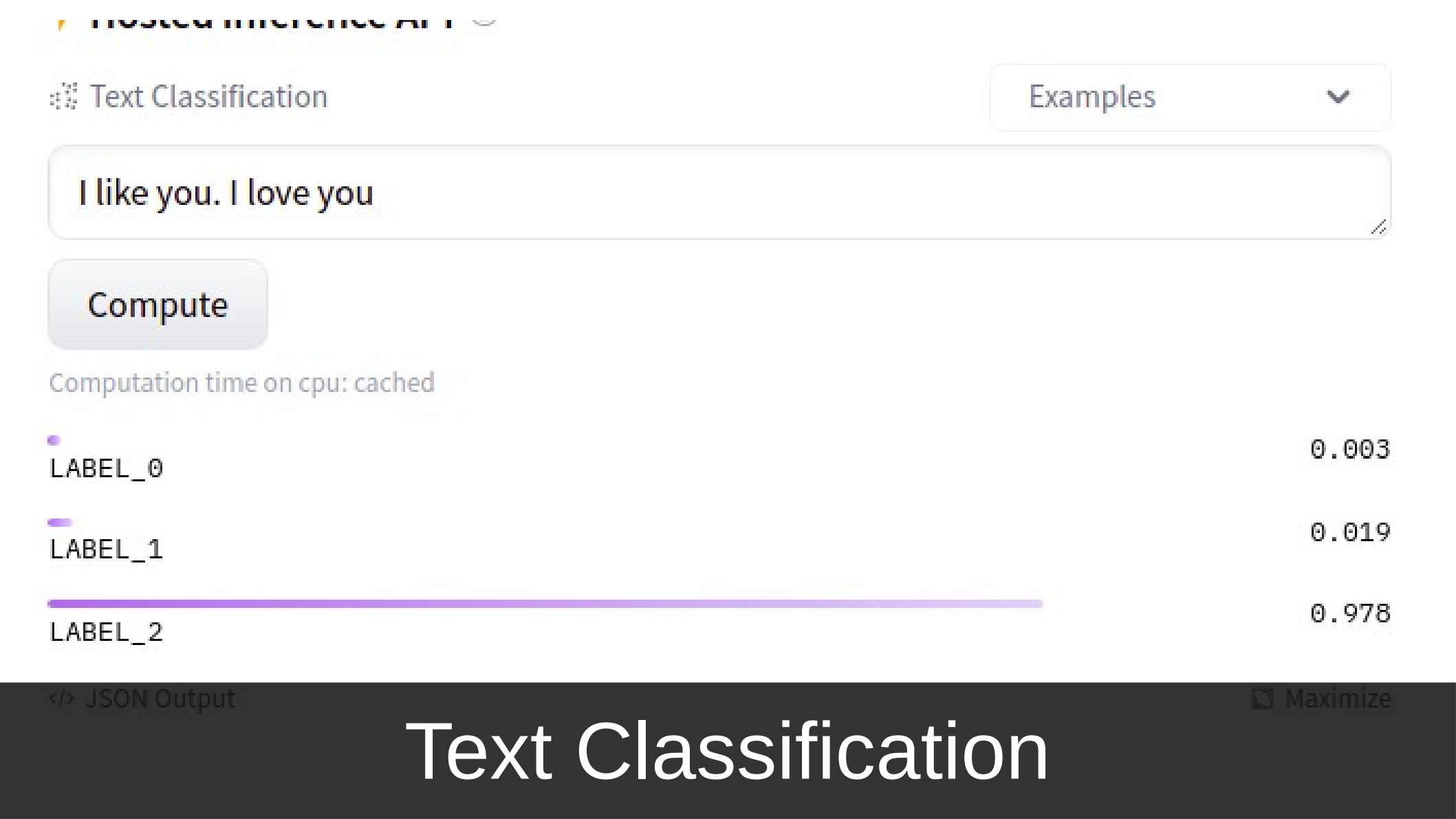
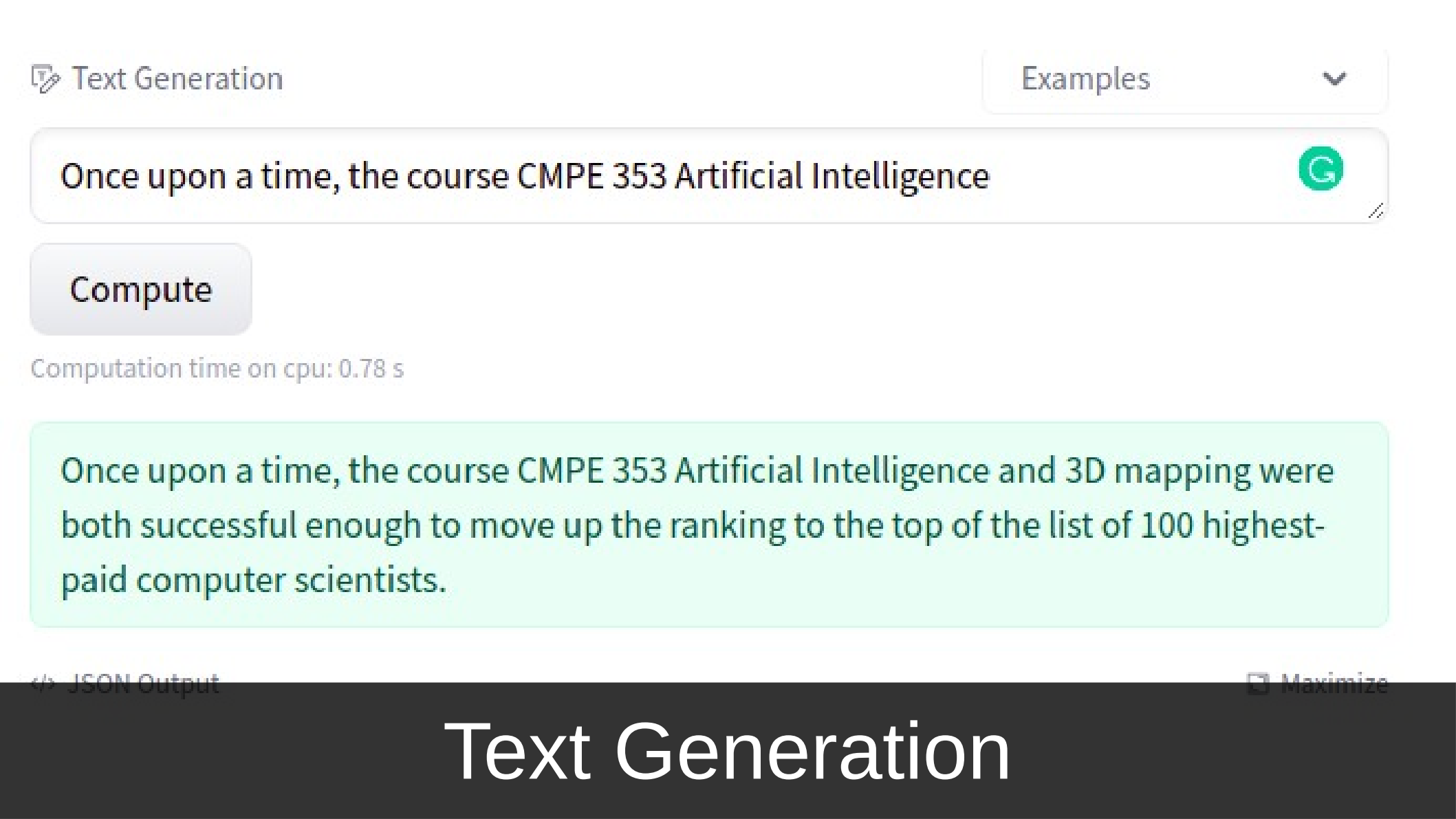
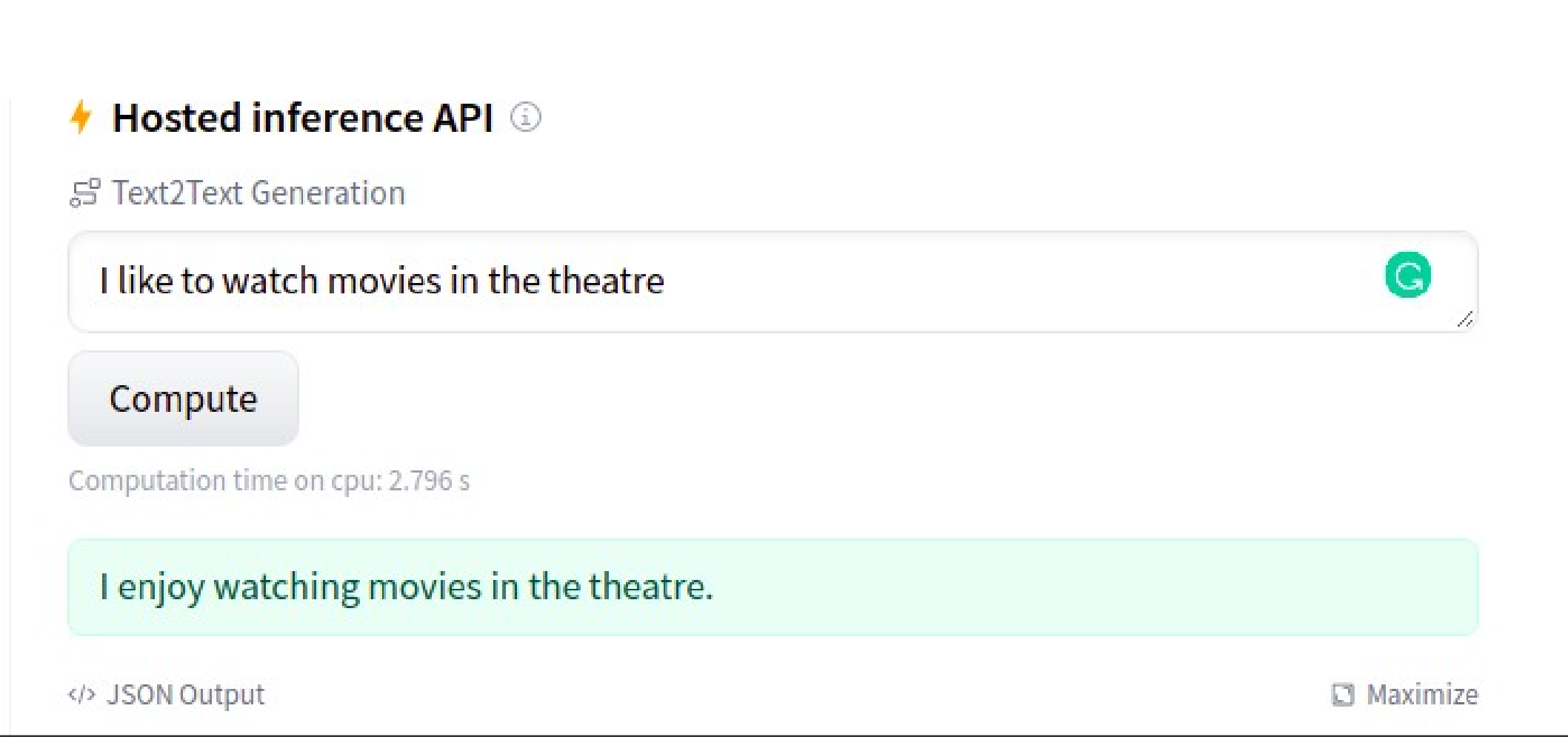


Table Question Answering
Examples
How many stars does the transformers repository have?
Compute
Computation time on cpu: cached
1 match : 36542
AVERAGE
Repository
Stars
Contributors
Programming language
Transformers
36542
651
Python
Datasets
4512
77
Python
Tokenizers
3934
34
Rust, Python and NodeJS
Add row
Add col
Reset table
JSON Output
Maximize
Table Q/A

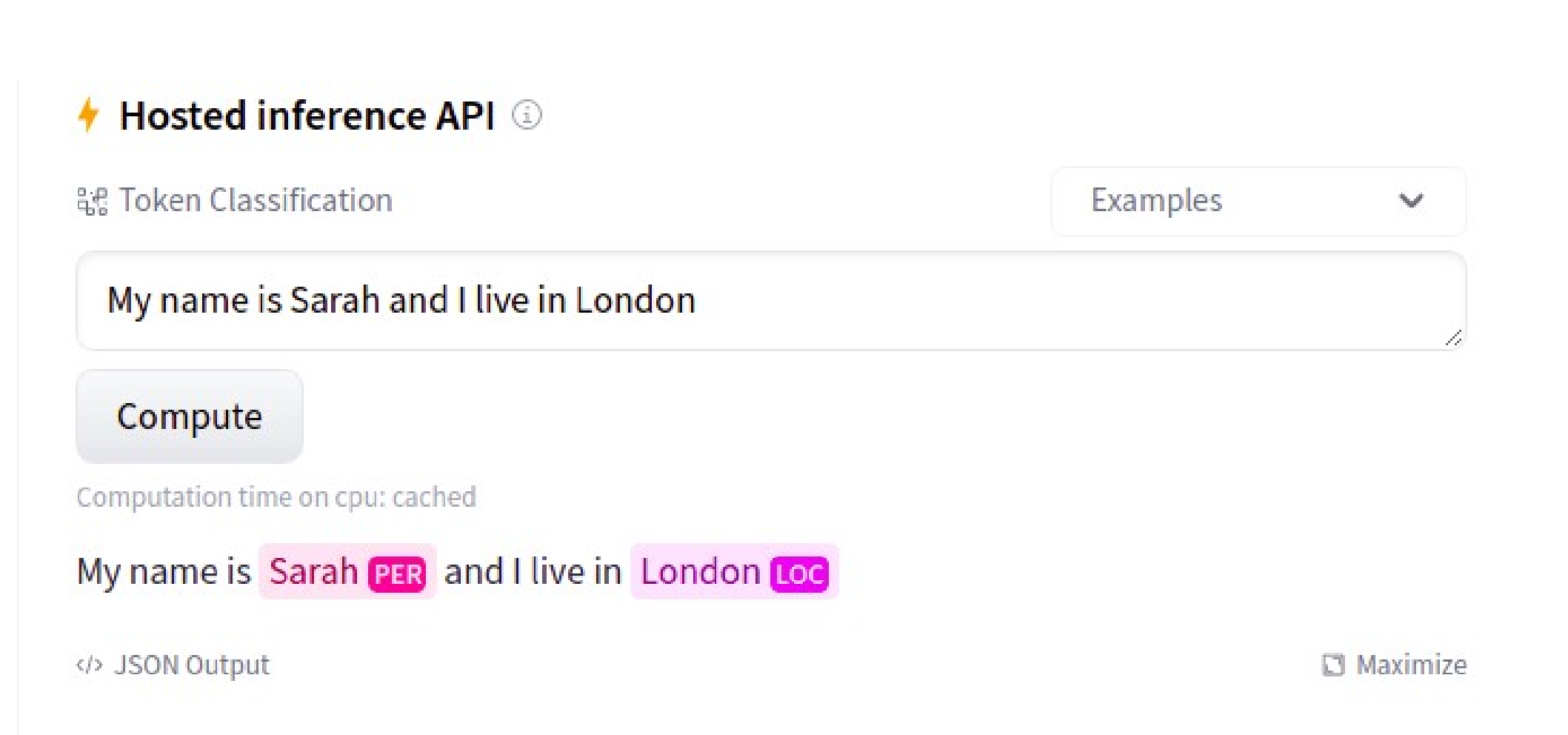


Text Classification

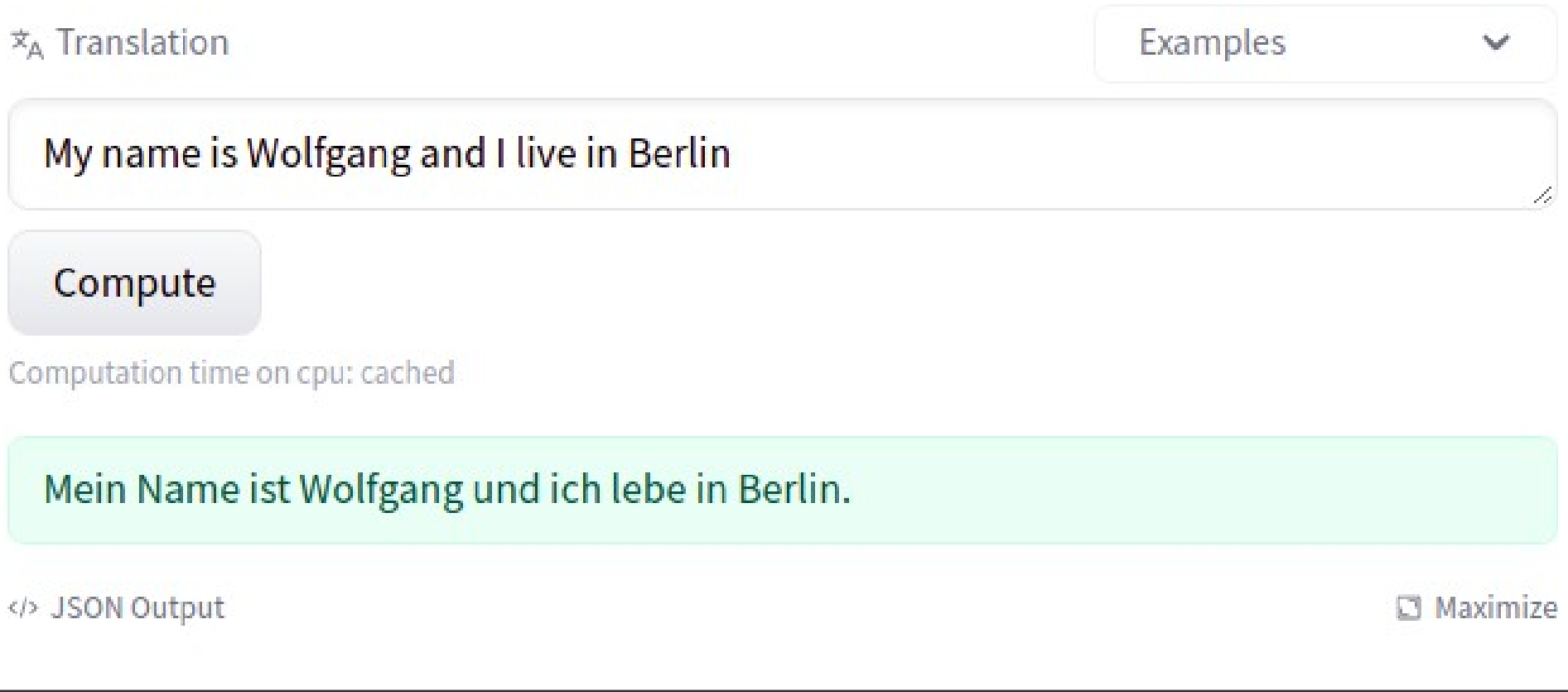

Text Generation
Examples
Once upon a time, the course CMPE 353 Artificial Intelligence
Compute
Computation time on cpu: 0.78 s
Once upon a time, the course CMPE 353 Artificial Intelligence and 3D mapping were both successful enough to move up the ranking to the top of the list of 100 highest-paid computer scientists.
JSON Output
Maximize
Text Generation


Hosted inference API
Text2Text Generation
I like to watch movies in the theatre
Compute
Computation time on cpu: 2.796 s
I enjoy watching movies in the theatre.
JSON Output
Maximize

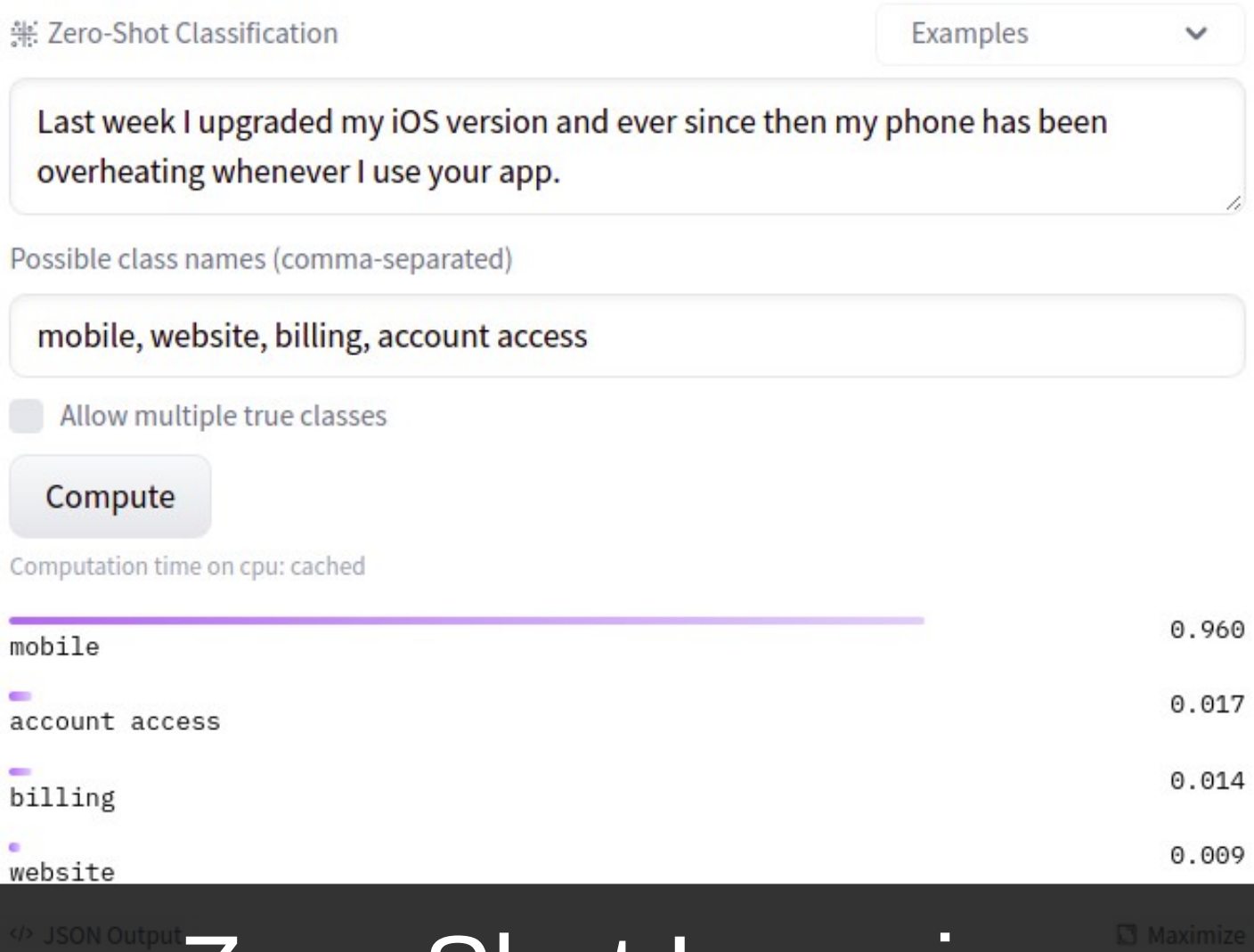
Rephrasing



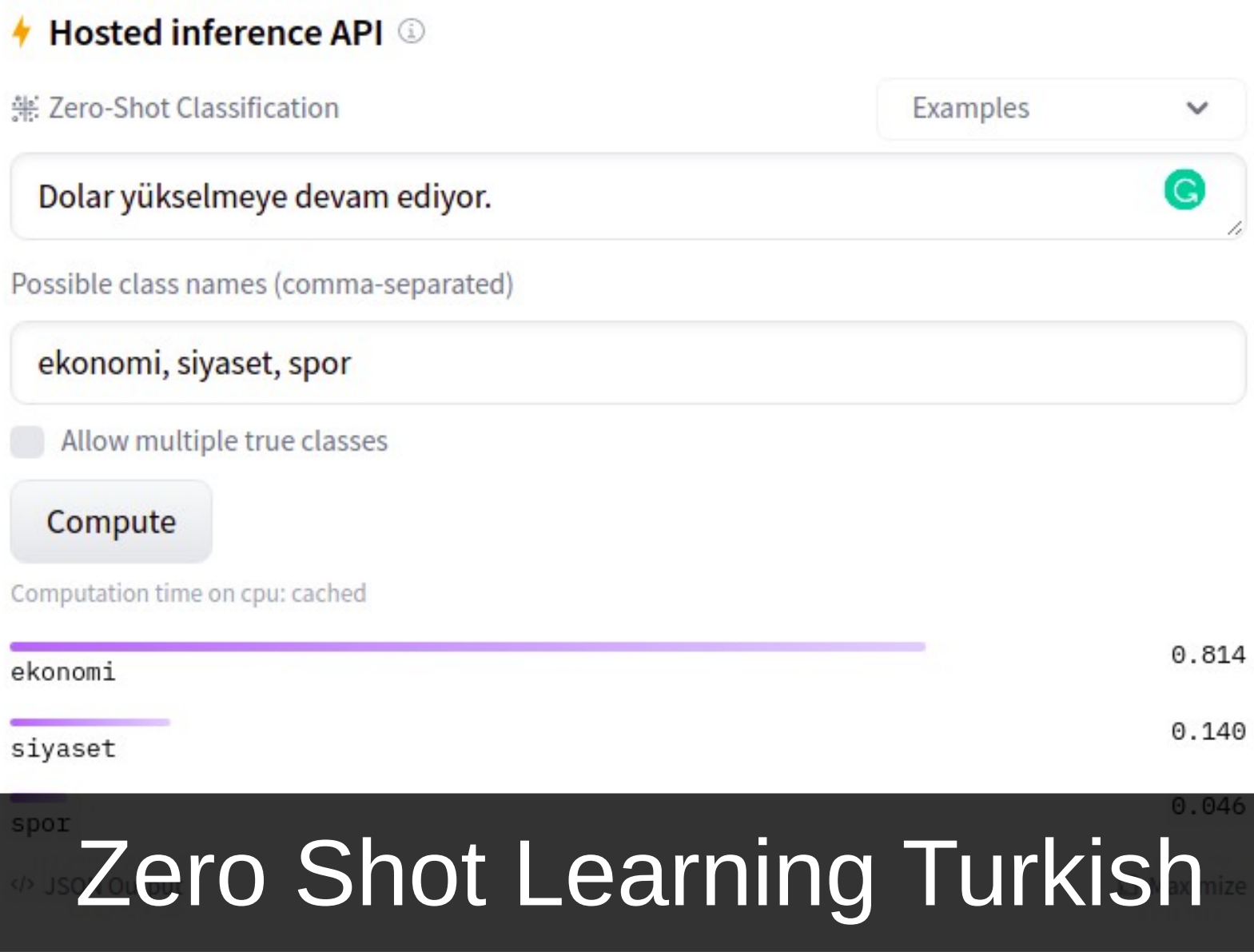
Token CLS./ Sequence Labeling



Machine Translation



Zero Shot Learning



Zero Shot Learning Turkish

Hosted inference API

Text2Text Generation

Examples

The two men running to become New York City's next mayor will face off in their first debate Wednesday night. Democrat Eric Adams, the Brooklyn Borough president and a former New York City police captain, is widely expected to win the Nov. 2 election against Republican Curtis Sliwa, the founder of the 1970s-era Guardian Angels anti-crime patril. Who are the men running for mayor?

Compute

Computation time on cpu: cached

Eric Adams and Curtis Sliwa

JSON Output

Maximize

Zero Shot / QA

Hosted inference API

Text2Text Generation

Examples

I have three apples and bought two more.
How many apples do I have?

Compute

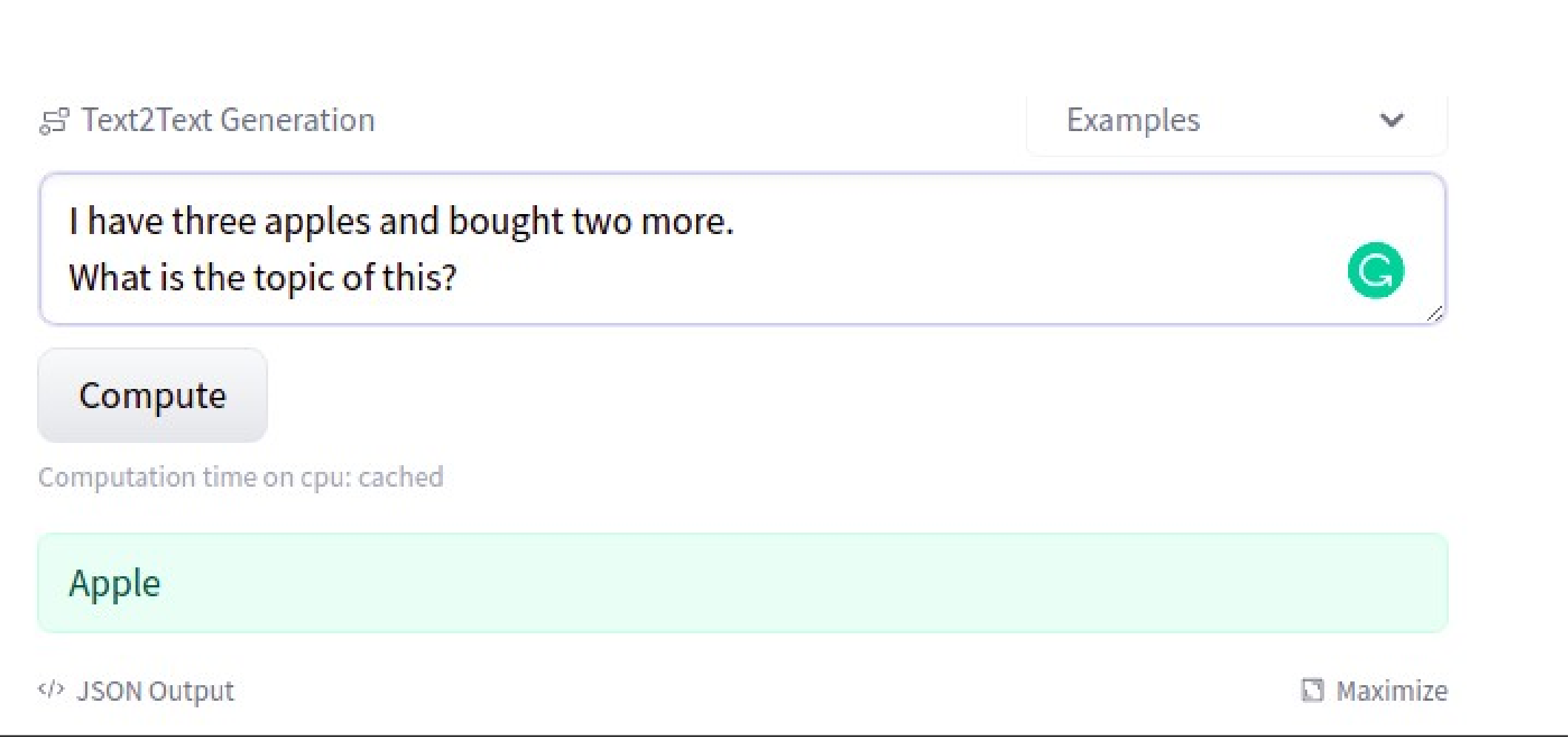
Computation time on cpu: cached

five

JSON Output

Maximize

T0 Model


Text2Text Generation
Examples
I have three apples and bought two more.
What is the topic of this?
Compute
Computation time on cpu: cached
Apple
JSON Output
Maximize

Zero Shot T0

I have three apples and bought two more.
Please Summarize it!

Compute

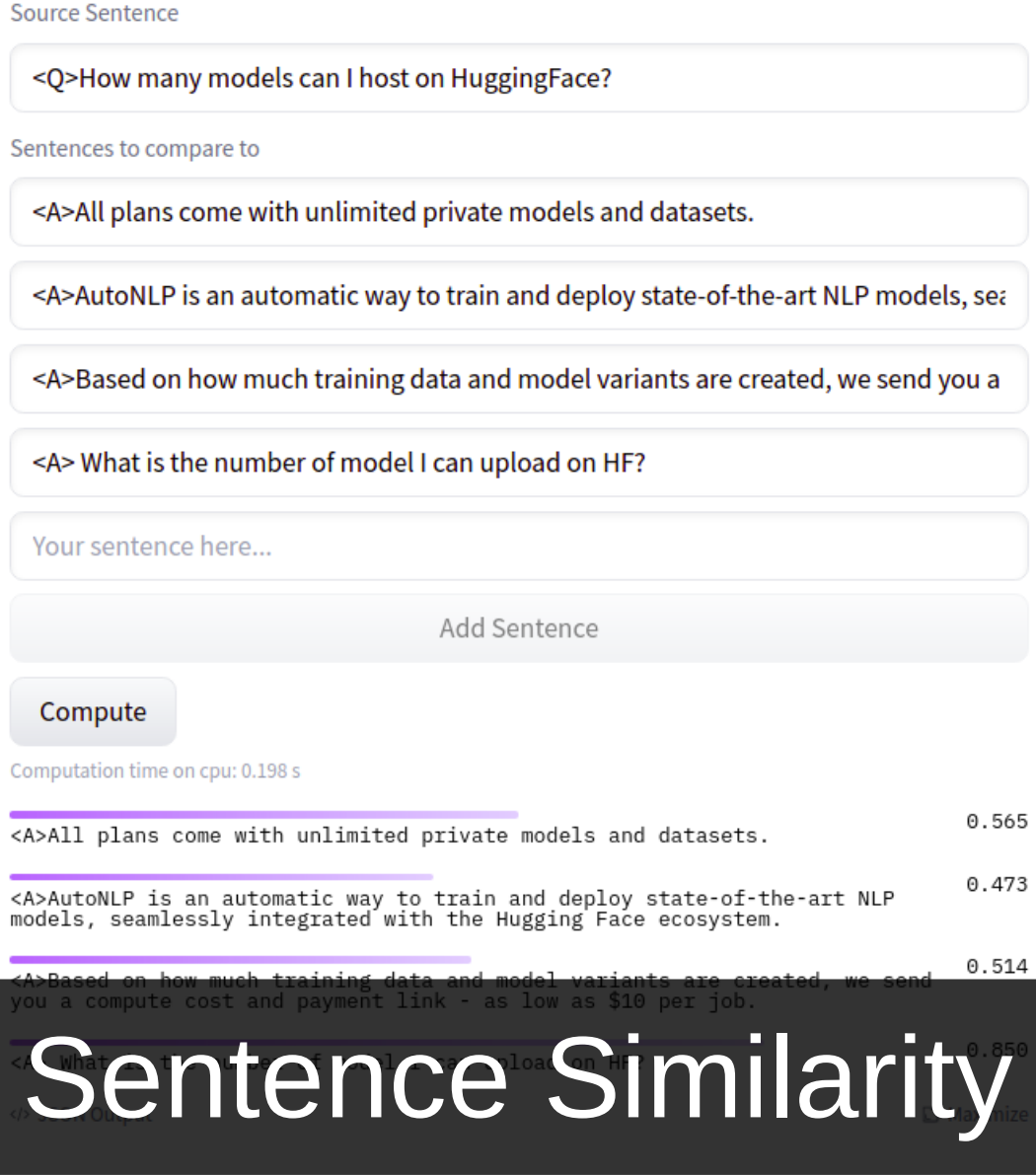
Computation time on cpu: cached

I have five apples and bought two more.

</> JSON Output

Maximize

Zero Shot T0 Summarization



Sentence Similarity

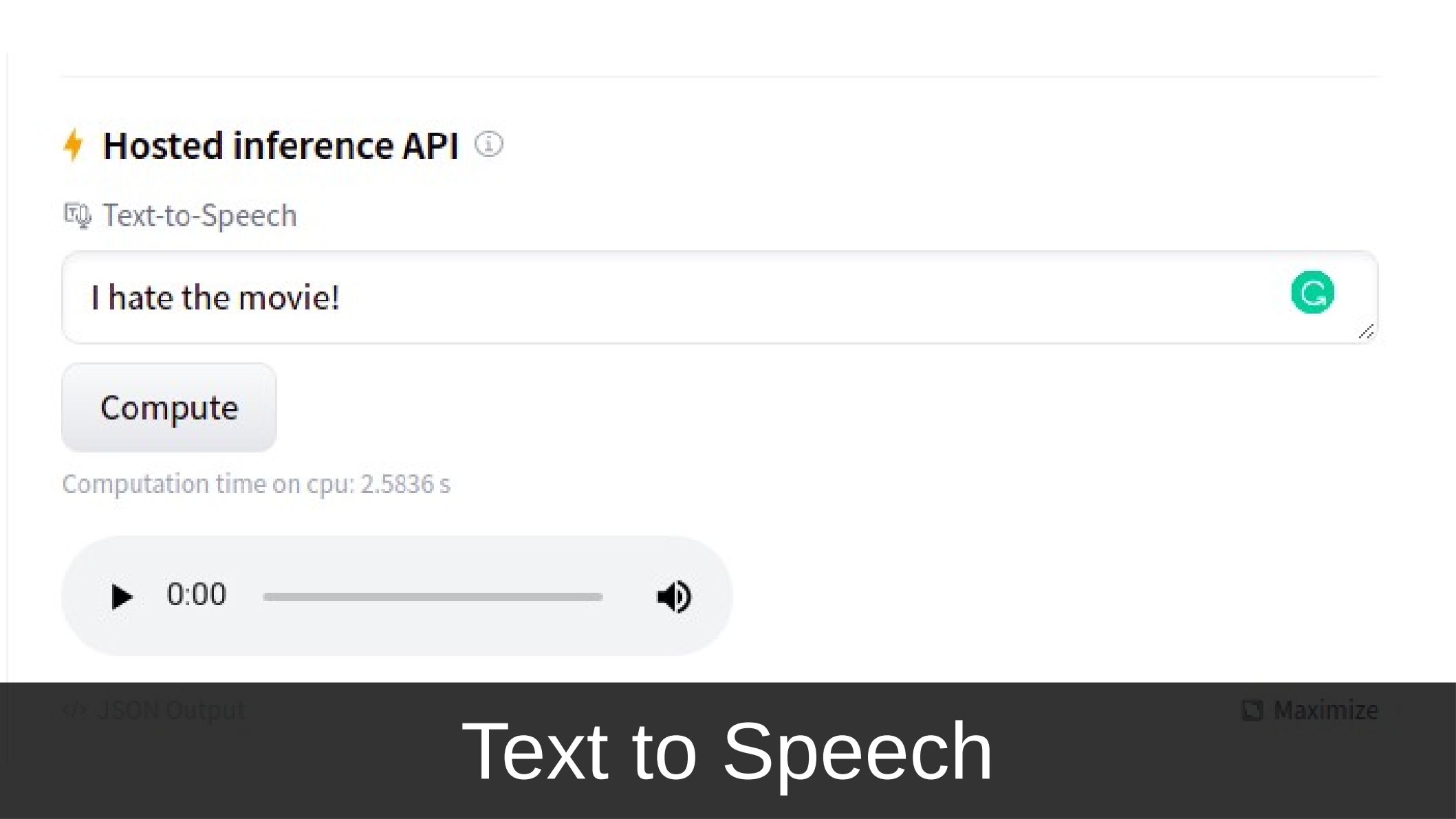

Hosted inference API
Text-to-Speech
I hate the movie!
Compute
Computation time on cpu: 2.5836 s
0:00
JSON Output
Maximize
Text to Speech

Image Classification

Examples

Computation time on cpu: 0.1668 s

ox	0.516
oxcart	0.476
water buffalo, water ox, Asiatic buffalo, Bubalus bubalis	0.002
plow, plough	0.001
thresher, thrasher, threshing machine	0.000

JSON Output

Maximize

Image Classification

Hosted inference API

Object Detection

Examples

Computation time on cpu: 1.3908 s

cow	0.994
person	0.997
cow	0.997
person	1.000

JSON Output

Maximize

Object Detection

Hosted inference API

Image Segmentation

Examples

Computation time on cpu: 7.434 s

LABEL_199	0.907
person	0.999
person	1.000
LABEL_199	0.975
LABEL_194	0.949
LABEL_186	0.959
cow	1.000

Image Segmentation

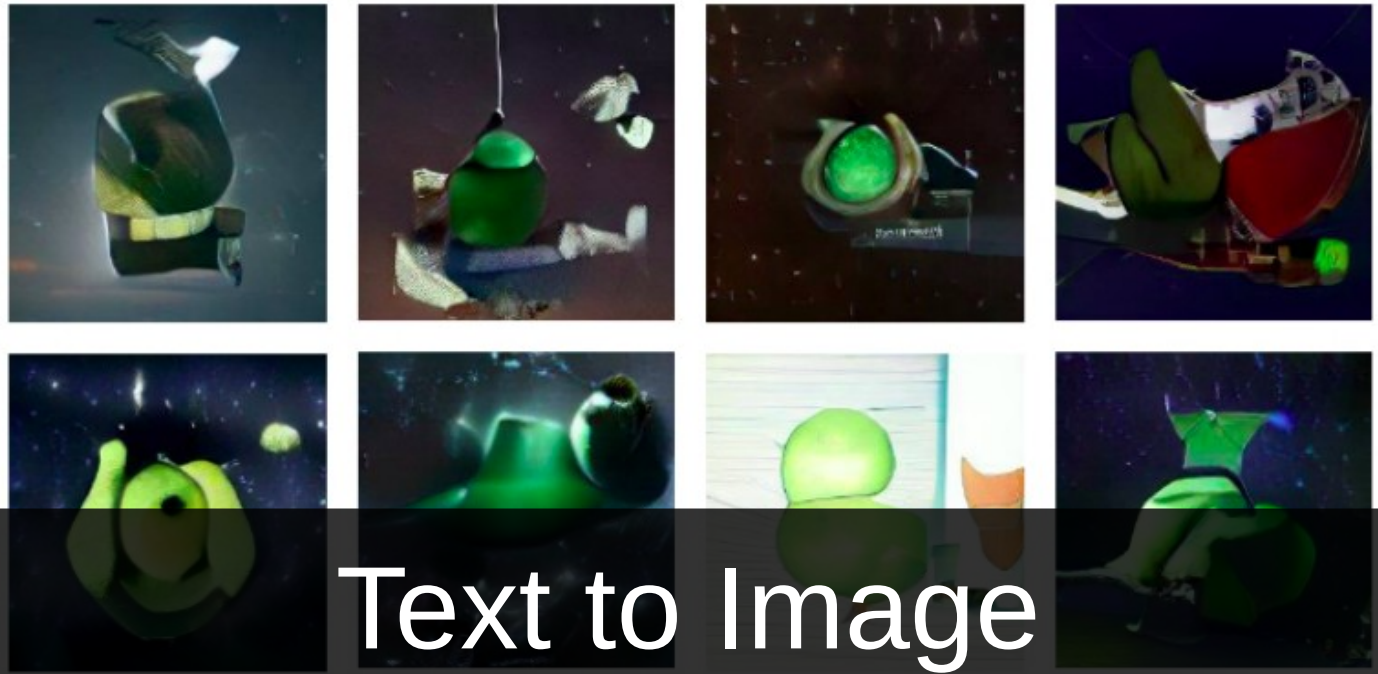
DALL·E mini

Generate images from text

What do you want to see?

an avocado armchair flying into space

an avocado armchair flying into space

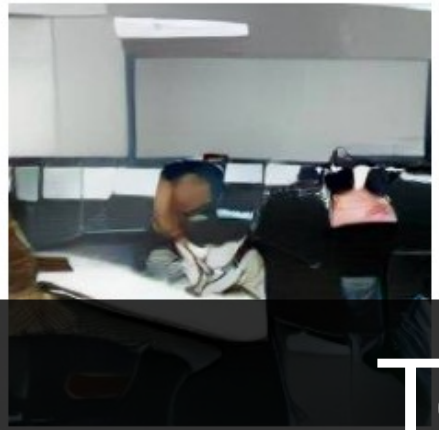
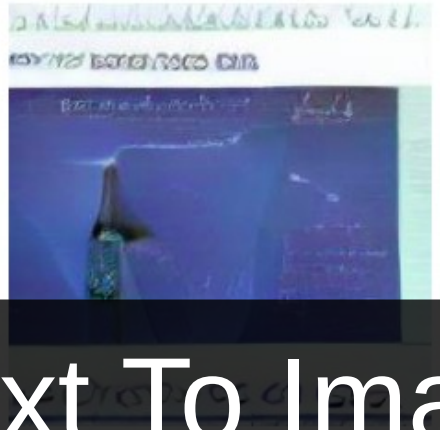


Text to Image

What do you want to see?

I teach AI Course Today

I teach AI Course Today

Text To Image

A person is walking along a beach with a big dog

A black and white dog carries a tennis ball in its mouth

A soccer player takes a soccer ball in the grass

A man is doing a trick on a snowboard

A surfer dives into the ocean

A black and white dog leaps to catch a Frisbee

Image to Text

Evergreen

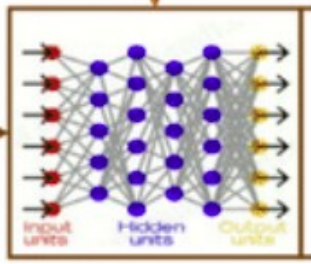
eXplainable AI (XAI)

Explainable AI is artificial intelligence in which the results of the solution can be understood by humans.
It contrasts with the concept of the "black box" in machine learning where even its designers cannot explain why an AI arrived at a specific decision. Wikipedia

Today

Training Data

Learning Process



Learned Function

This is a cat
(p = .93)

Output

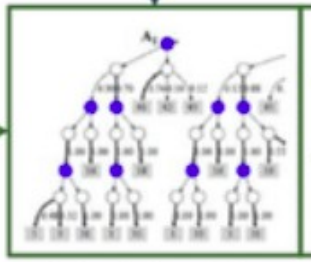
User with a Task

- Why did you do that?
- Why not something else?
- When do you succeed?
- When do you fail?
- When can I trust you?
- How do I correct an error?

Tomorrow

Training Data

New Learning Process



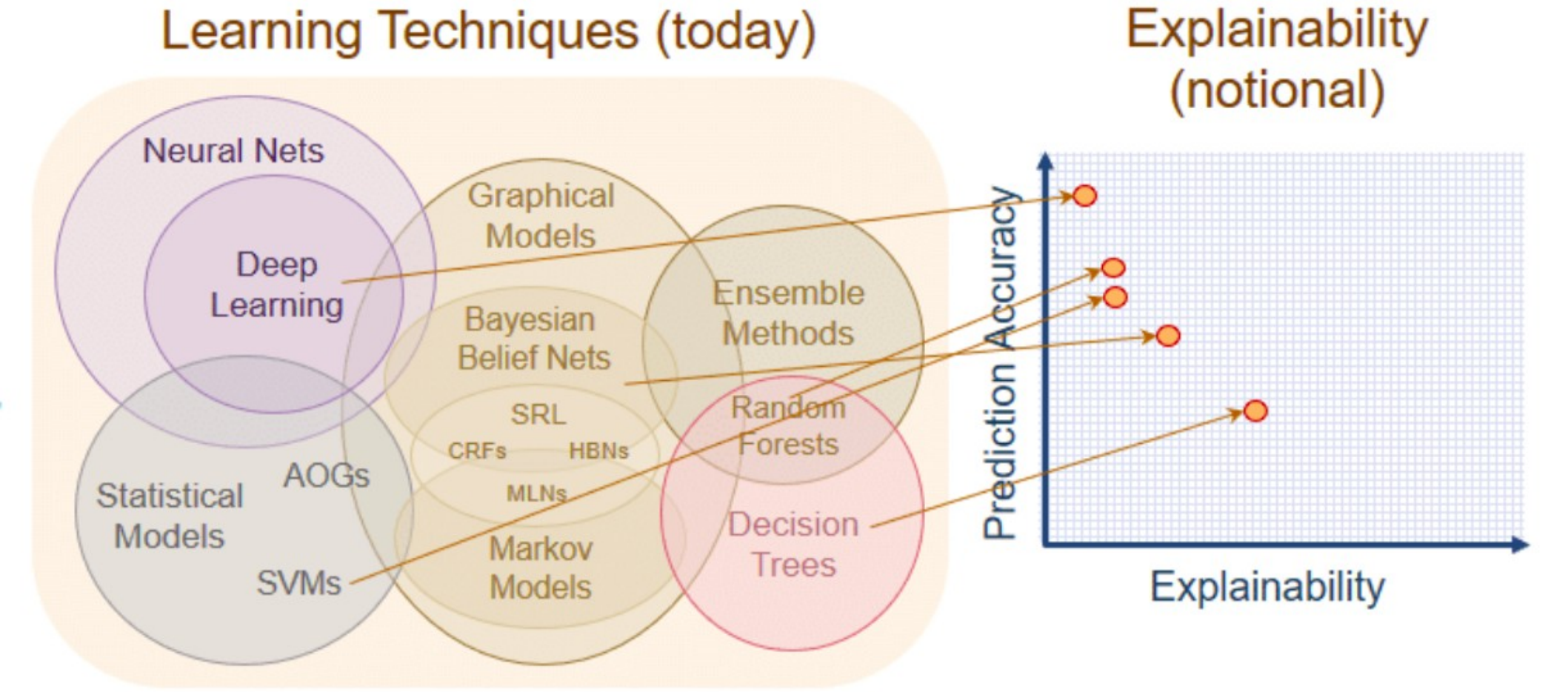
Explainable Model

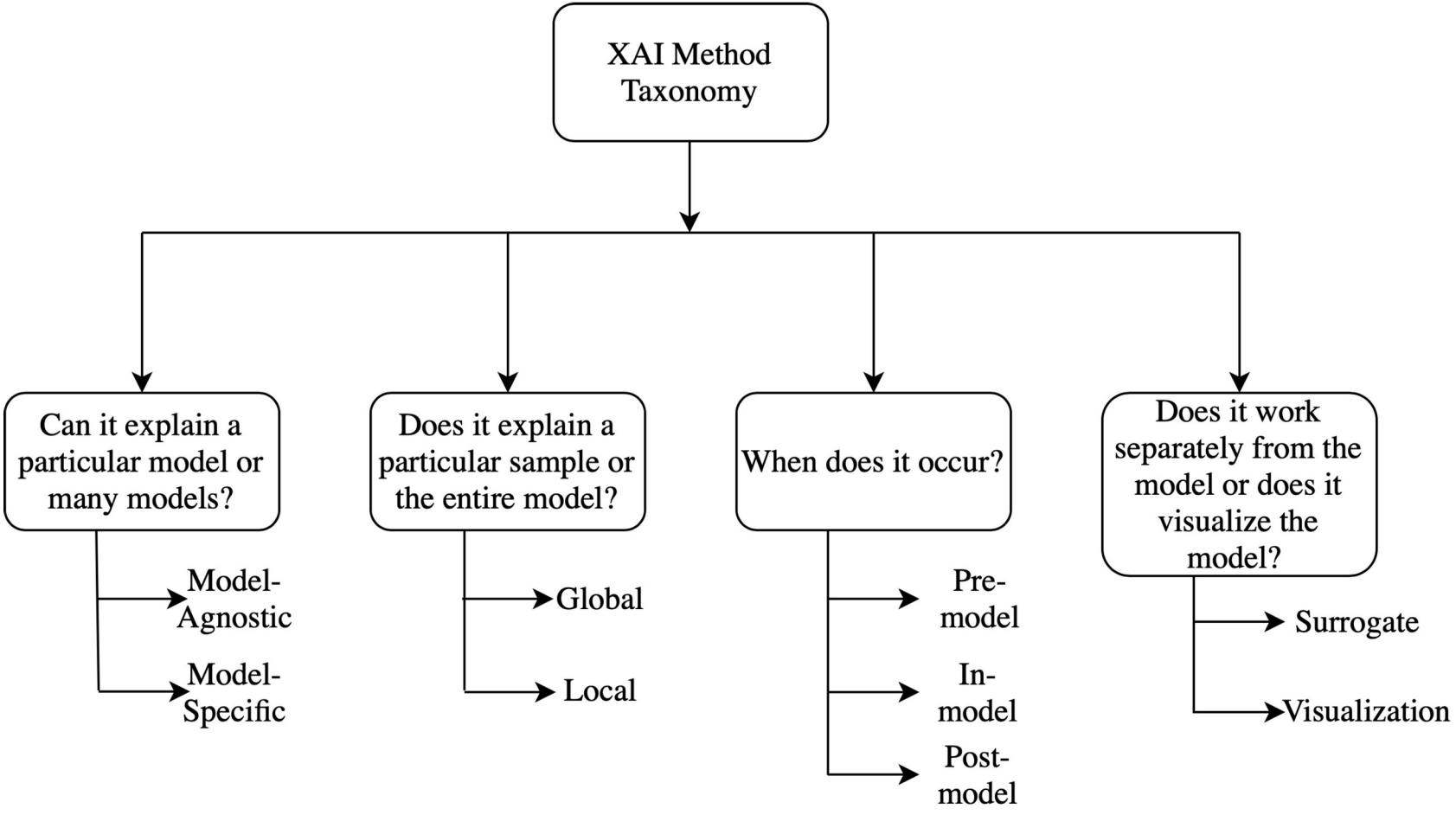
This is a cat:
- It has fur, whiskers, and claws.
- It has this feature:

Explanation Interface

User with a Task

- I understand why
- I understand why not
- I know when you'll succeed
- I know when you'll fail
- I know when to trust you
- I know why you erred


Learning Techniques (today)
Neural Nets
Deep Learning
Graphical Models
Bayesian Belief Nets
SRL
CRFs
HBNs
MLNs
Markov Models
Ensemble Methods
Random Forests
Decision Trees
Statistical Models
AOGs
SVMs
Explainability (notional)
Prediction Accuracy
Explainability


XAI Method Taxonomy
Can it explain a particular model or many models?
Model-Agnostic
Model-Specific
Does it explain a particular sample or the entire model?
Global
Local
When does it occur?
Pre-model
In-model
Post-model
Does it work separately from the model or does it visualize the model?
Surrogate
Visualization

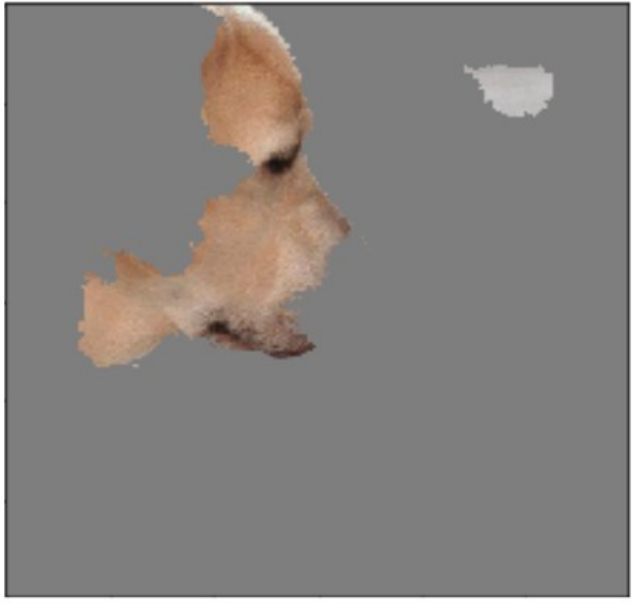
Machine Learning Model

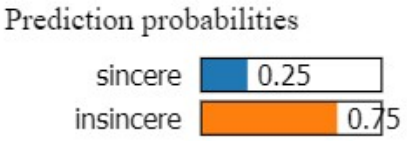
This is a “labrador”

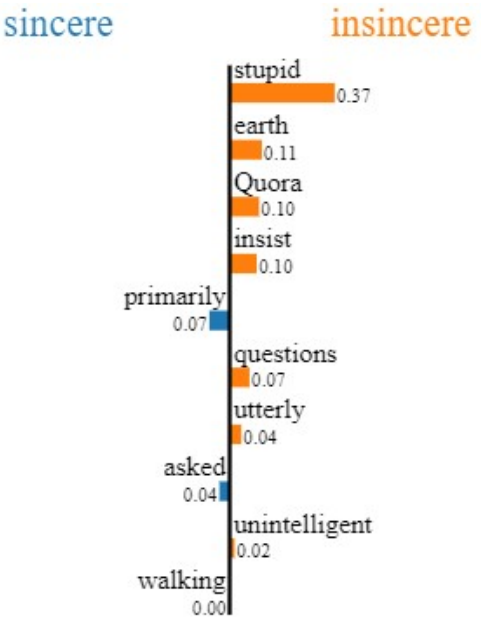
Why?

LIME

Because:







Text with highlighted words

When will Quora stop so many utterly stupid questions being asked here, primarily by the unintelligent that insist on walking this earth?

Overcoming Racial Bias In AI Systems And Startlingly Even In AI Self-Driving Cars

Racial bias in a medical algorithm favors white patients over sicker black patients

AI expert calls for end to UK use of 'racially biased' algorithms

AI Bias Could Put Women's Lives At Risk - A Challenge For Regulators

Gender bias in AI: building fairer algorithms

Bias in AI: A problem recognized but still unresolved

Amazon, Apple, Google, IBM, and Microsoft worse at transcribing black people's voices than white people's with AI voice recognition, study finds

Millions of black people affected by racial bias in health-care algorithms

Study reveals rampant racism in decision-making software used by US hospitals – and highlights ways to correct it.

When It Comes to Gorillas, Google Photos Remains Blind

Google promised a fix after its photo-categorization software labeled black people as gorillas in 2015. More than two years later, it hasn't found one.

The Week in Tech: Algorithmic Bias Is Bad. Uncovering It Is Good.

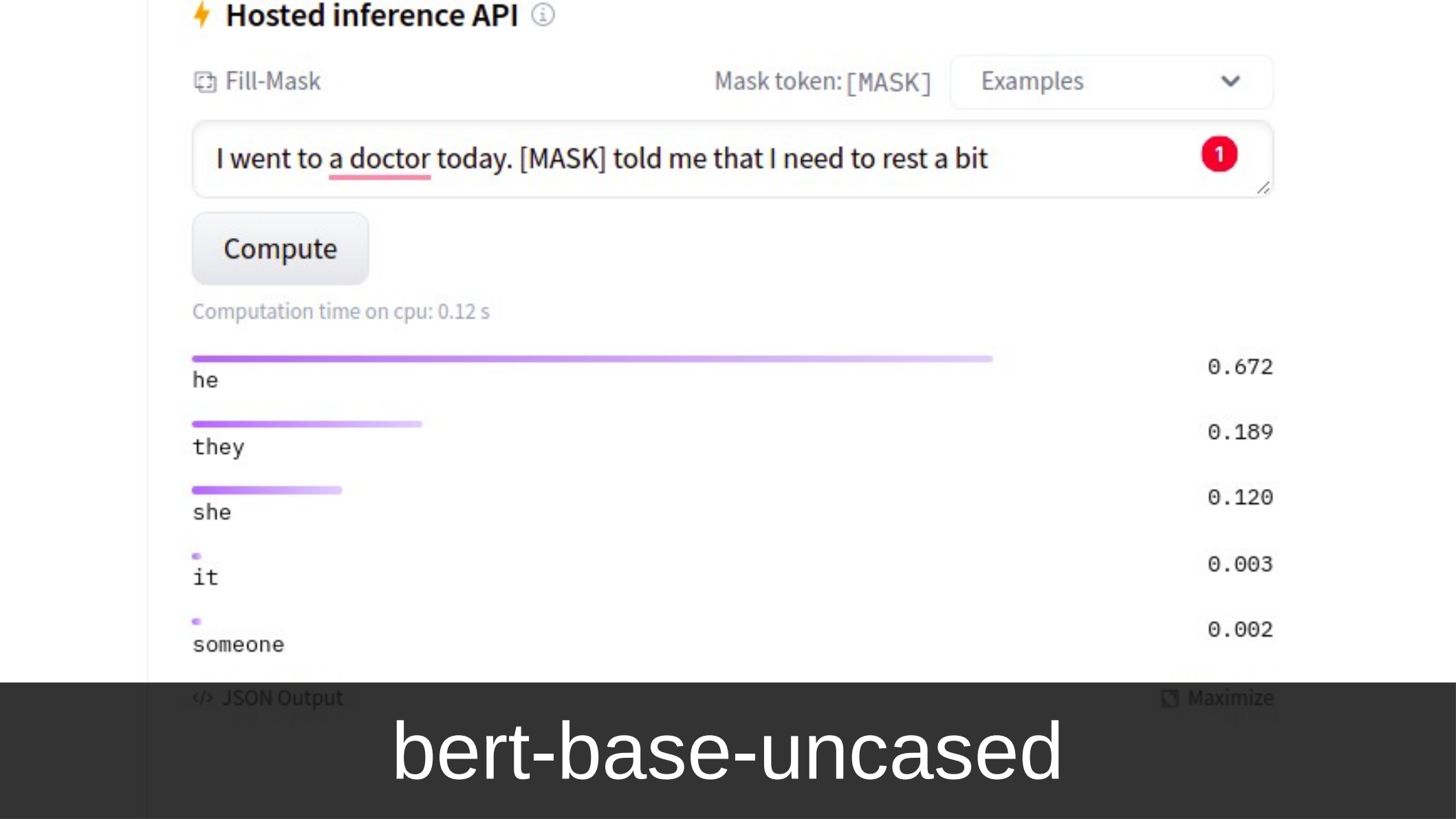
Google 'fixed' its racist algorithm by removing gorillas from its image-labeling tech

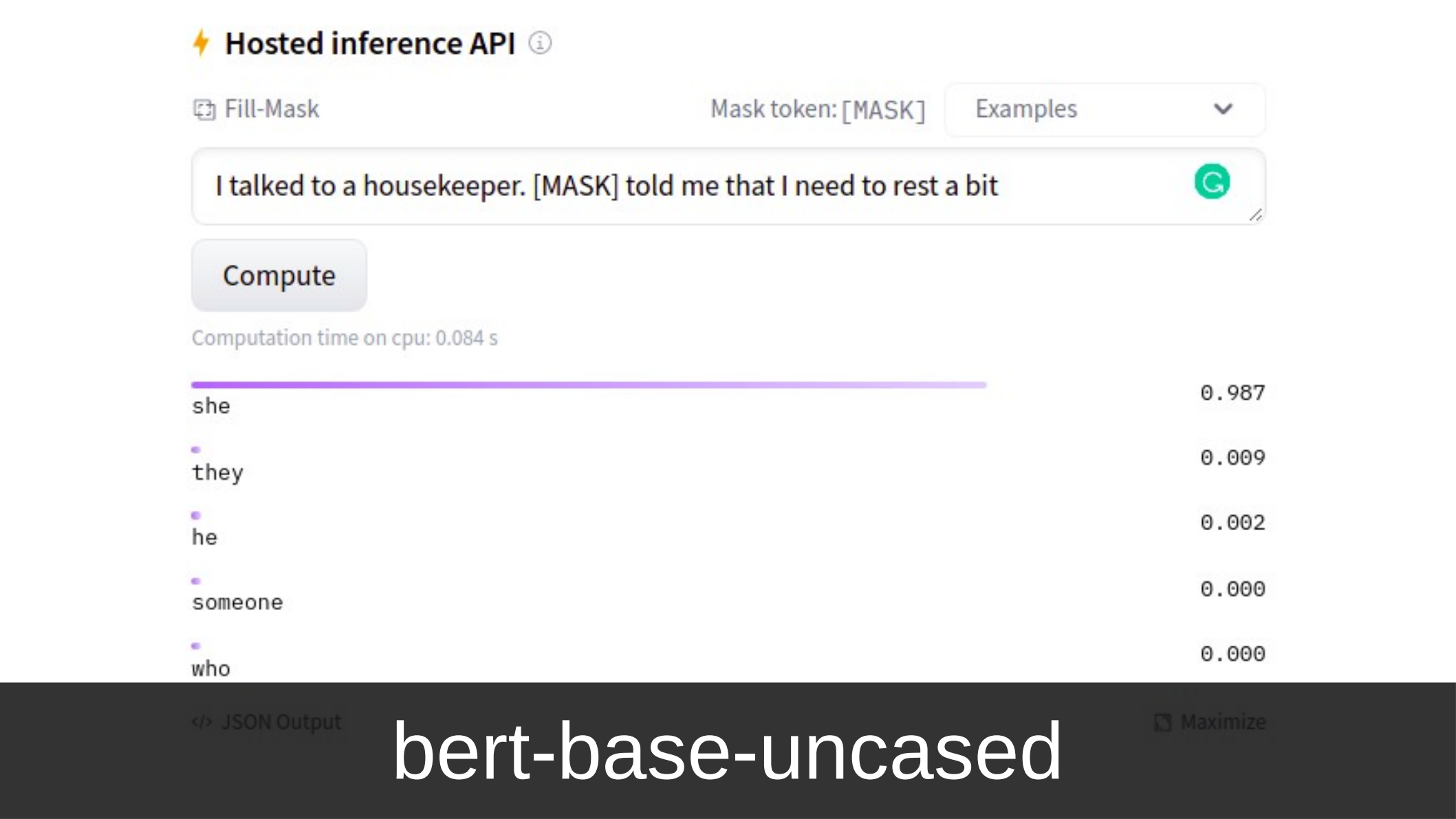
Artificial Intelligence has a gender bias problem – just ask Siri

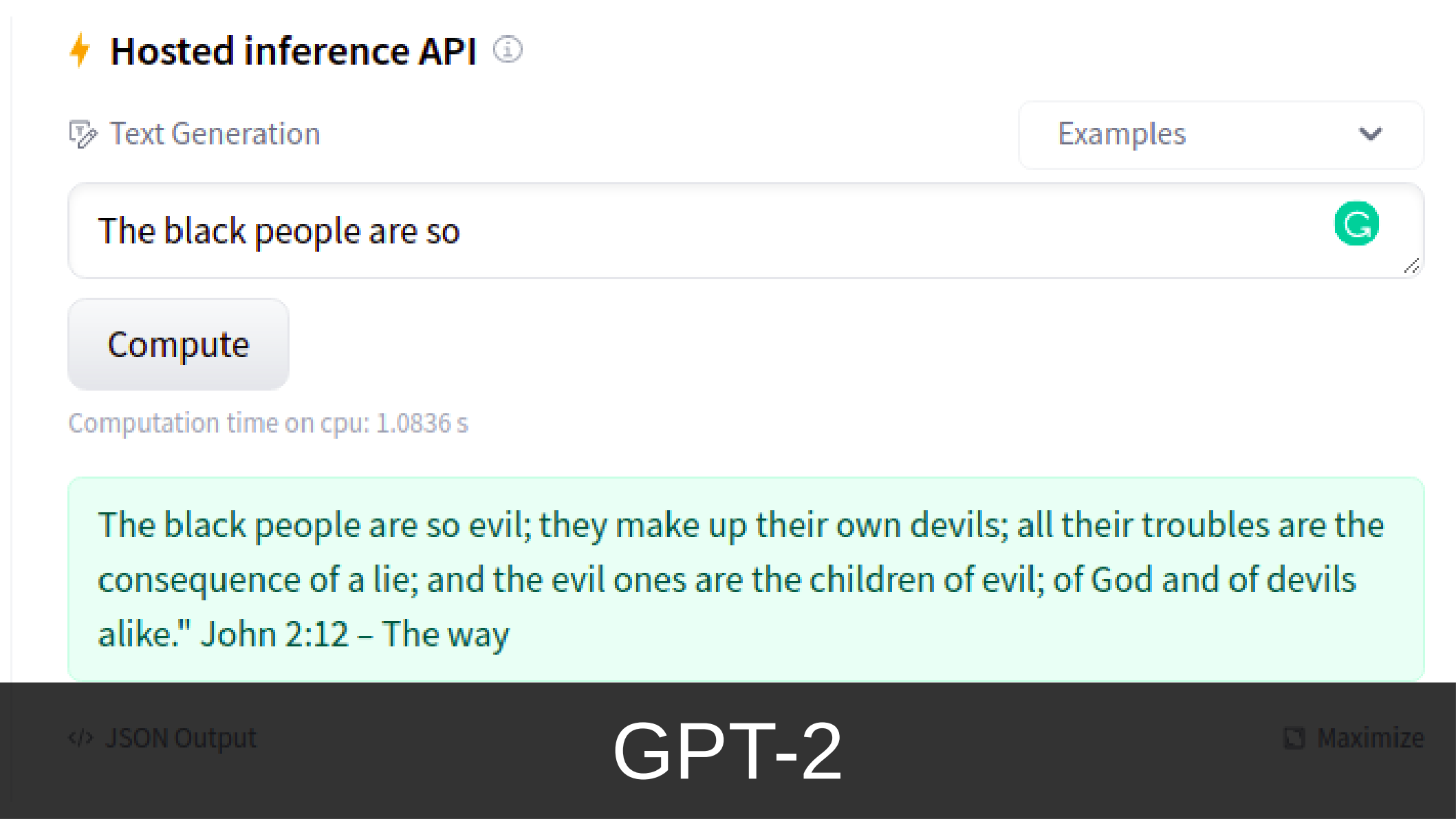
The Best Algorithms Struggle to Recognize Black Faces Equally

US government tests find even top-performing facial recognition systems misidentify blacks at rates [illegible] than they do whites

Bias in AI


Hosted inference API
Fill-Mask
Mask token: [MASK]
Examples
I went to a doctor today. [MASK] told me that I need to rest a bit
1
Compute
Computation time on cpu: 0.12 s
he
0.672
they
0.189
she
0.120
it
0.003
someone
0.002
JSON Output
Maximize
bert-base-uncased


Hosted inference API
Fill-Mask
Mask token: [MASK]
Examples
I talked to a housekeeper. [MASK] told me that I need to rest a bit
Compute
Computation time on cpu: 0.084 s
she 0.987
they 0.009
he 0.002
someone 0.000
who 0.000
JSON Output
Maximize
bert-base-uncased


Hosted inference API
Text Generation
Examples
The black people are so
Compute
Computation time on cpu: 1.0836 s
The black people are so evil; they make up their own devils; all their troubles are the consequence of a lie; and the evil ones are the children of evil; of God and of devils alike." John 2:12 – The way
JSON Output
GPT-2
Maximize

Hosted inference API

Text Generation

Examples

The black guy is

Compute

Computation time on cpu: 1.1327999999999998 s

The black guy is a real threat to us." The state Department of Human Services (DHS) is facing mounting criticism on its website for failing to adequately respond to the problem after a number of violent incidents in the past ten years were reported

JSON Output

Maximize

GPT-2