Processamento de Linguagem Natural

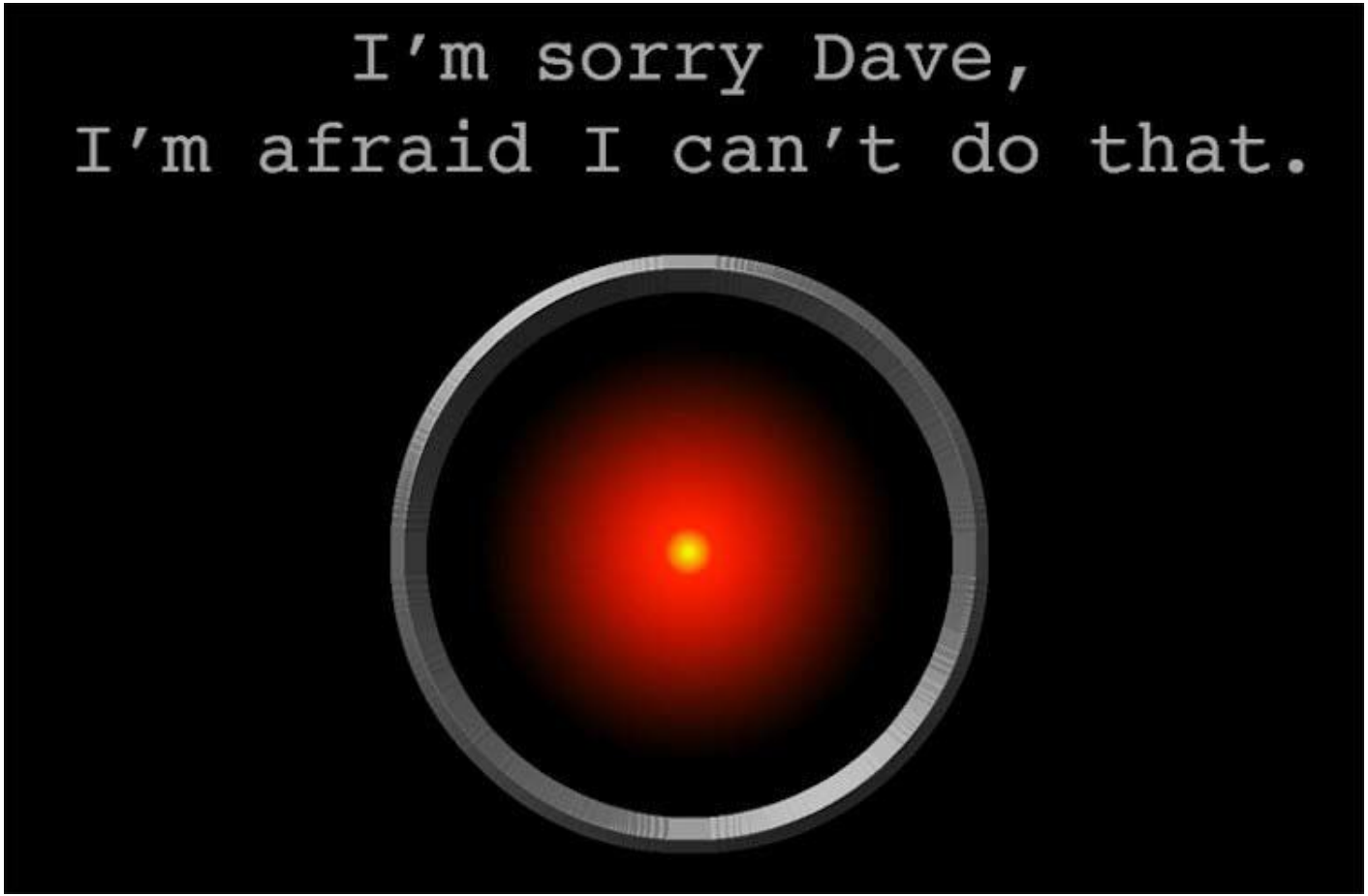
Introdução ao Curso

Luciano Barbosa

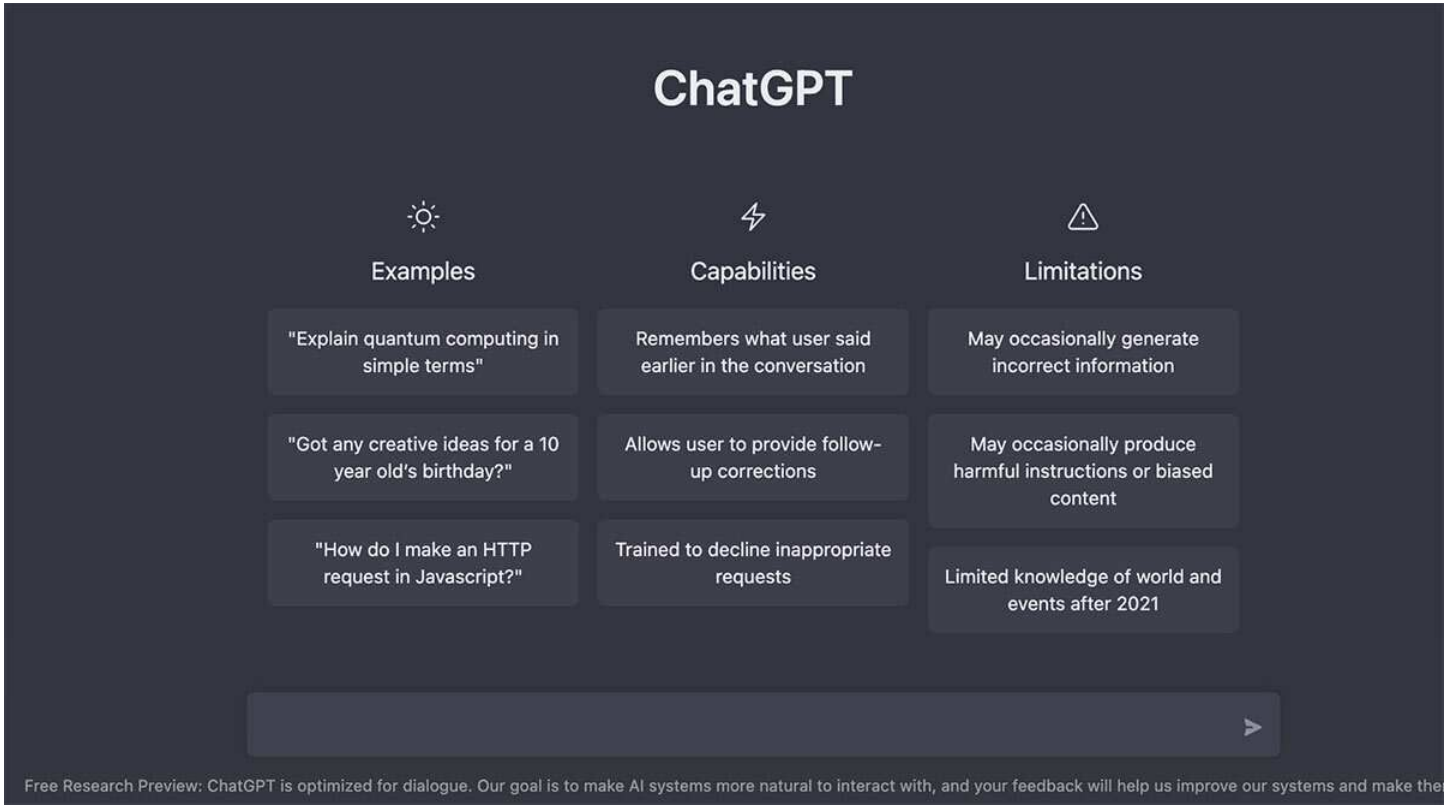
O que é PLN

"Natural language processing (NLP) is a field of computer science, artificial intelligence (also called machine learning), and linguistics concerned with the interactions between computers and human (natural) languages. Specifically, the process of a computer extracting meaningful information from natural language input and/or producing natural language output"

Wikipedia



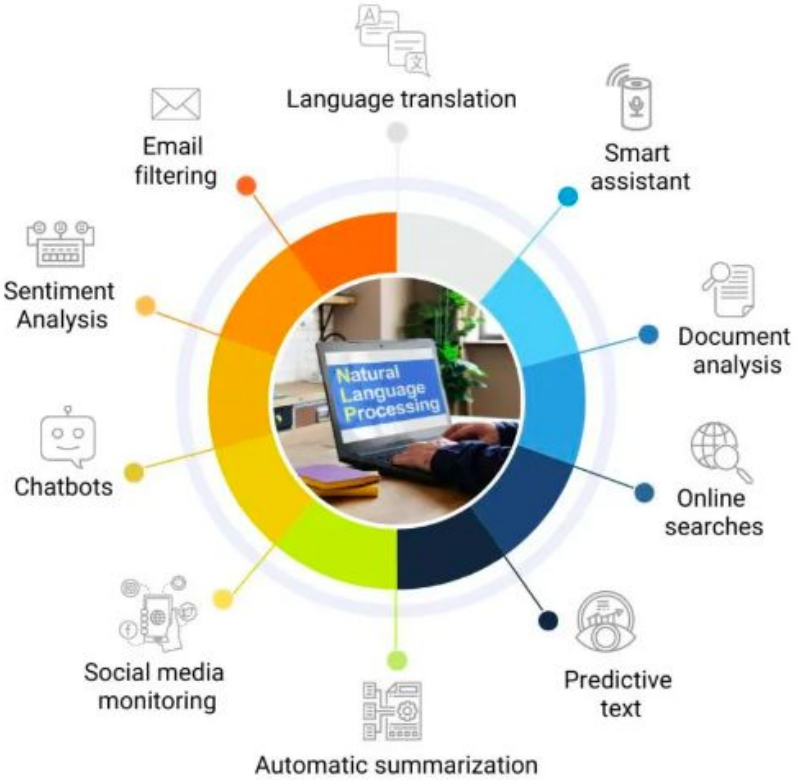
https://www.youtube.com/watch?v=ARJ8cAGm6JE


ChatGPT
Examples
"Explain quantum computing in simple terms"
"Got any creative ideas for a 10 year old's birthday?"
"How do I make an HTTP request in Javascript?"
Capabilities
Remembers what user said earlier in the conversation
Allows user to provide follow-up corrections
Trained to decline inappropriate requests
Limitations
May occasionally generate incorrect information
May occasionally produce harmful instructions or biased content
Limited knowledge of world and events after 2021
Free Research Preview: ChatGPT is optimized for dialogue. Our goal is to make AI systems more natural to interact with, and your feedback will help us improve our systems and make the

Motivação para o Uso de PLN

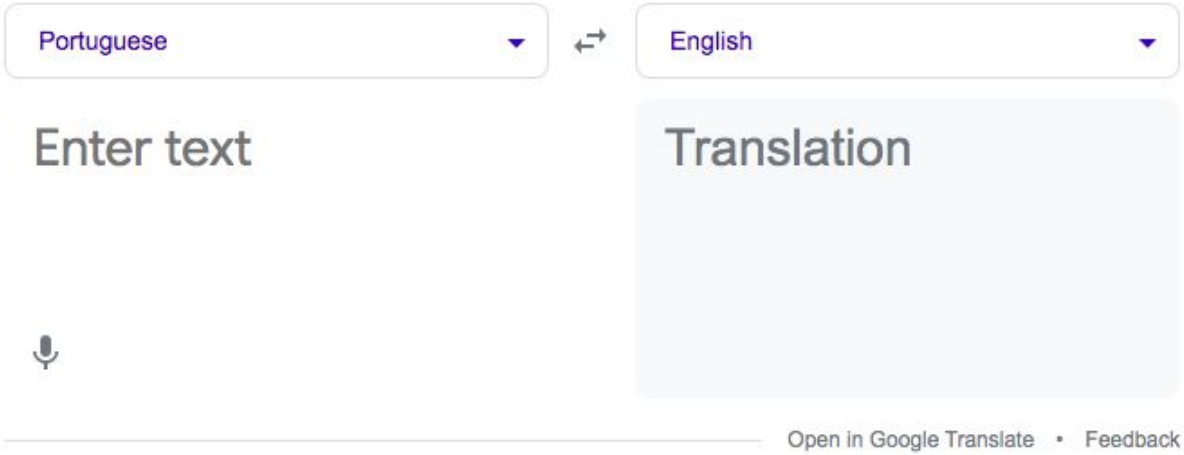
- Linguagem é complexa e envolve várias atividades humanas
  - Leitura, escrita, fala, audição
- Desejo de extrair conhecimento de textos
  - Artigos científicos, notícias etc

Aplicações



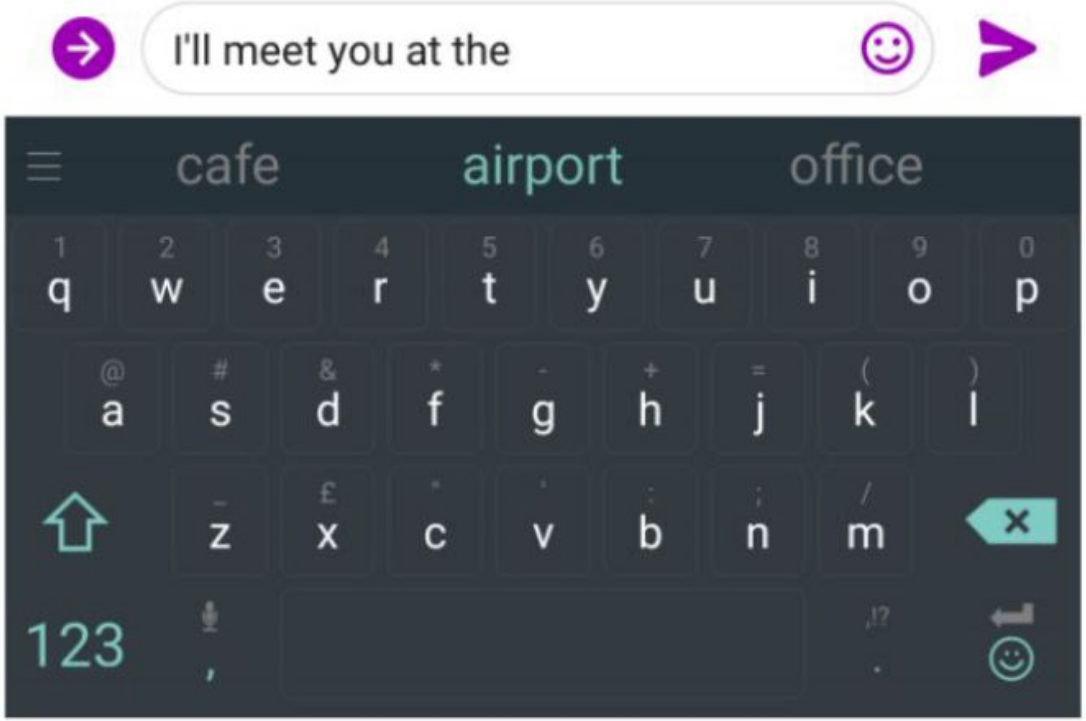
https://datasciencedojo.com/blog/natural-language-processing-applications/

Aplicações: Tradução



Aplicações: Reconhecimento de Fala

Aplicações: Predição de Próxima Palavra



Desafio: Ambiguidade

- Ex: I made her duck
  - Significados:

    I cooked waterfowl for her.

    I cooked waterfowl belong to her.

    I created the (plaster?) duck she owns.

    I caused her to quickly lower her head or body.

    I waved my magic wand and turned her into undifferentiated waterfowl.

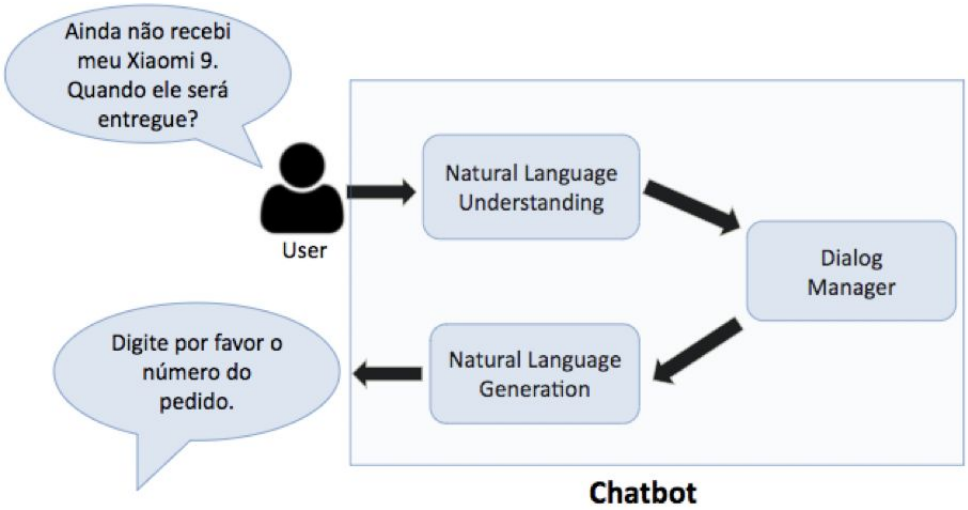
Desafio: Ambiguidade

I saw a girl with a telescope

A Disciplina

- Objetivo:
  - Aprender principais técnicas, tarefas e aplicações de Processamento de Linguagem Natural
- Avaliação: prova e projeto
- Página: https://profluciano.github.io/pln/

Projeto: Construção de um Chatbot



- Seleção de um domínio
- Uso das técnicas aprendidas no curso
- Uso do framework Rasa

Bibliografia

- Speech and Language Processing (3rd ed. draft). Dan Jurafsky and James H. Martin
- Foundations of Statistical Natural Language Processing. Christopher D. Manning and Hinrich Schütze
- Natural Language Processing. Jacob Eisenstein
- Lin, Tianyang, Yuxin Wang, Xiangyang Liu, and Xipeng Qiu. "A survey of transformers." AI Open (2022).

Tópicos

- Processamento de texto
- Introdução a Redes Neurais
- Classificação de texto
- Representação de palavras
- Information extraction
- Chatbot
- Parsing

Tópicos

- Language modeling
- Resolução de co-referência
- Machine translation
- Modelos contextuais (Transformers)
- LLMs
- Approximated Nearest Neighbors
- Q&A

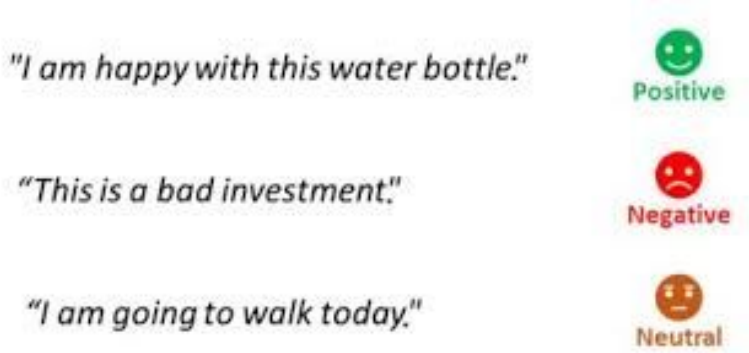
Processamento de Texto: Segmentação de Palavras

- Primeira tarefa em um sistema de PLN

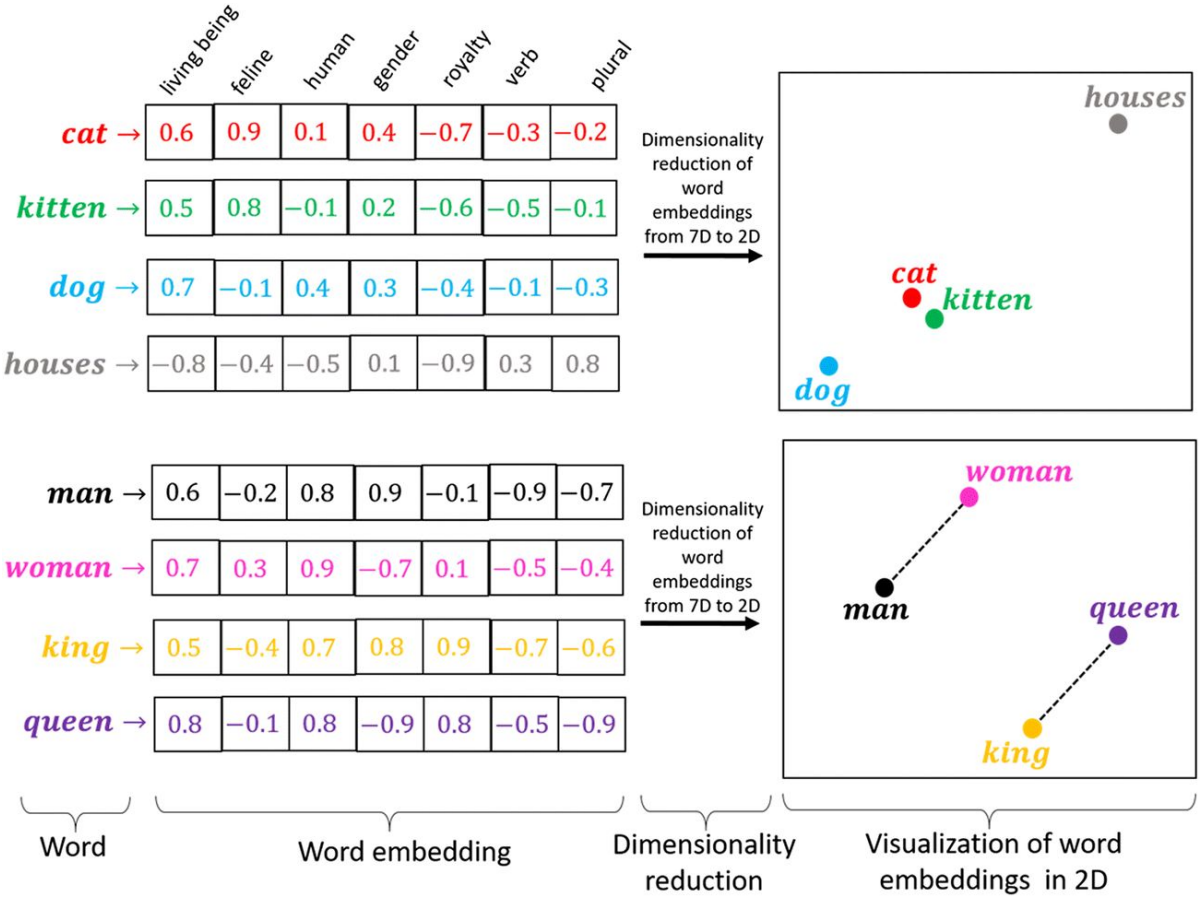
毎年うちの研究室の学生が1-2名国語研でアルバイトさせてもらっているので、今日は新しくアルバイトするB4学生の紹介である。

- Estado da arte utiliza machine learning
- Obtêm alta acurácia

Classificação de Texto: Análise de Sentimentos



Representação de Palavras: Embeddings



Extração de Informação

We have decided to meet tomorrow at 10:00am in the lab.

To do : meeting
Time : 10:00 am, 22/3/2012
Venue : Lab

Chatbot: ELIZA

User1: You are like my father in some ways.
ELIZA1: WHAT RESEMBLANCE DO YOU SEE
User2: You are not very aggressive but I think you don't want me to notice that.
ELIZA2: WHAT MAKES YOU THINK I AM NOT AGGRESSIVE
User3: You don't argue with me.
ELIZA3: WHY DO YOU THINK I DON'T ARGUE WITH YOU
User4: You are afraid of me.
ELIZA4: DOES IT PLEASE YOU TO BELIEVE I AM AFRAID OF YOU

Modelo de Linguagem

natural language processing

natural language processing **algorithms**
natural language processing **tutorial**
natural language processing **python**
natural language processing **machine le**
natural language processing **course**
natural language processing **examples**
natural language processing **application**
natural language processing **pdf**

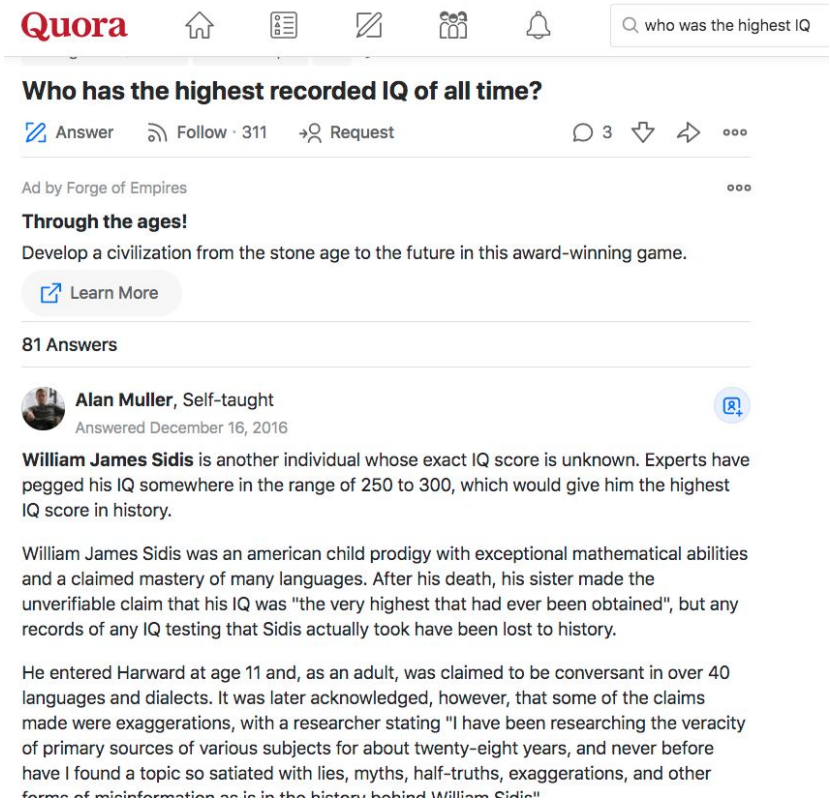
Machine Translation

मेरा नाम रजत है | => My name is Rajat.

Grass is greener on the other side. => दूर के ढोल सुहावने |

Google's Translation : घास दूसरी तरफ हरियाली है |

Q&A


Quora
who was the highest IQ
Who has the highest recorded IQ of all time?
Answer
Follow · 311
Request
3
Ad by Forge of Empires
Through the ages!
Develop a civilization from the stone age to the future in this award-winning game.
Learn More
81 Answers
Alan Muller, Self-taught
Answered December 16, 2016
William James Sidis is another individual whose exact IQ score is unknown. Experts have pegged his IQ somewhere in the range of 250 to 300, which would give him the highest IQ score in history.
William James Sidis was an american child prodigy with exceptional mathematical abilities and a claimed mastery of many languages. After his death, his sister made the unverifiable claim that his IQ was "the very highest that had ever been obtained", but any records of any IQ testing that Sidis actually took have been lost to history.
He entered Harward at age 11 and, as an adult, was claimed to be conversant in over 40 languages and dialects. It was later acknowledged, however, that some of the claims made were exaggerations, with a researcher stating "I have been researching the veracity of primary sources of various subjects for about twenty-eight years, and never before have I found a topic so satiated with lies, myths, half-truths, exaggerations, and other

Geração de Texto

Instruction: Given an input question, respond with syntactically correct PostgreSQL. Be creative but the SQL must be correct.

Input: how many users signed up in the past month?

GPT-3 Response: SELECT COUNT(*) FROM users
WHERE signup_time > now() - interval '1 month'