

```
import tensorflow as tf
```

```
!pip install transformers
```

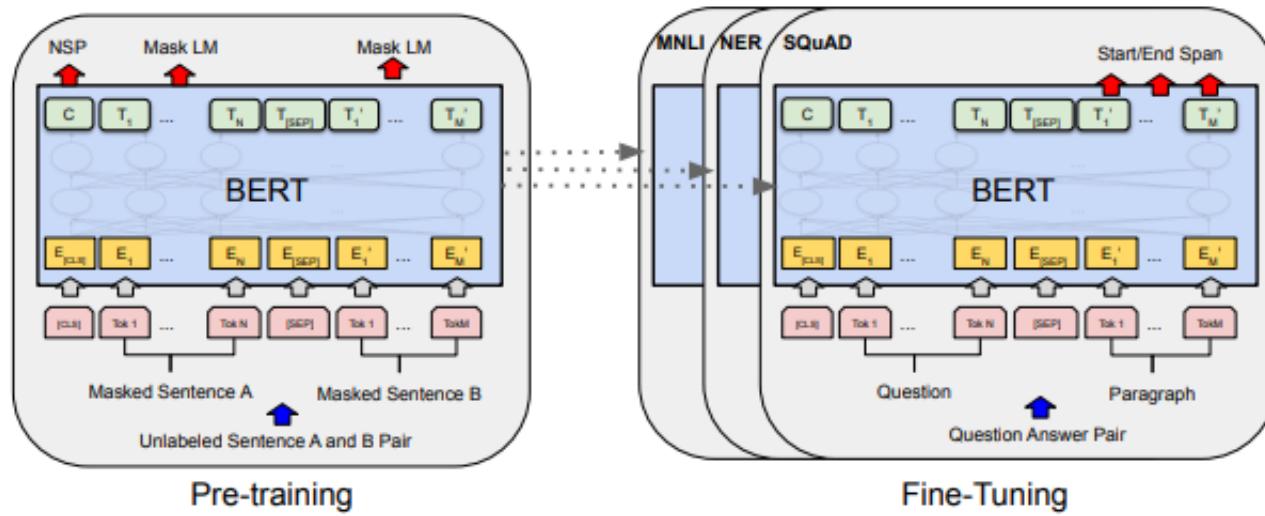
```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Collecting transformers
  Downloading transformers-4.24.0-py3-none-any.whl (5.5 MB)
    |████████████████████| 5.5 MB 8.0 MB/s
Requirement already satisfied: regex!=2019.12.17 in /usr/local/lib/python3.7/dist-packages (from transformers)
Requirement already satisfied: requests in /usr/local/lib/python3.7/dist-packages (from transformers) (2.28.1)
Collecting huggingface-hub<1.0,>=0.10.0
  Downloading huggingface_hub-0.11.1-py3-none-any.whl (182 kB)
    |████████████████████| 182 kB 16.1 MB/s
Requirement already satisfied: filelock in /usr/local/lib/python3.7/dist-packages (from transformers) (3.10.0)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.7/dist-packages (from transformers) (21.3)
Requirement already satisfied: numpy>=1.17 in /usr/local/lib/python3.7/dist-packages (from transformers) (1.24.2)
Requirement already satisfied: tqdm>=4.27 in /usr/local/lib/python3.7/dist-packages (from transformers) (4.64.1)
Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.7/dist-packages (from transformers) (6.0.1)
Collecting tokenizers!=0.11.3,<0.14,>=0.11.1
  Downloading tokenizers-0.13.2-cp37-cp37m-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (7.6 MB)
    |████████████████████| 7.6 MB 46.9 MB/s
Requirement already satisfied: importlib-metadata in /usr/local/lib/python3.7/dist-packages (from tokenizers) (6.7.0)
Requirement already satisfied: typing-extensions>=3.7.4.3 in /usr/local/lib/python3.7/dist-packages (from tokenizers) (4.5.0)
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in /usr/local/lib/python3.7/dist-packages (from tokenizers) (3.1.2)
Requirement already satisfied: zipp>=0.5 in /usr/local/lib/python3.7/dist-packages (from importlib-metadata) (3.15.0)
Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.7/dist-packages (from requests) (3.7.4)
Requirement already satisfied: urllib3!=1.25.0,!1.25.1,<1.26,>=1.21.1 in /usr/local/lib/python3.7/dist-packages (from requests) (1.26.15)
Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.7/dist-packages (from requests) (3.4)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.7/dist-packages (from requests) (2022.12.7)
Installing collected packages: tokenizers, huggingface-hub, transformers
Successfully installed huggingface-hub-0.11.1 tokenizers-0.13.2 transformers-4.24.0
```

```
from transformers import BertForQuestionAnswering, AutoTokenizer  
from transformers import pipeline
```

```
modelname = 'deepset/bert-base-cased-squad2'
```

```
model = BertForQuestionAnswering.from_pretrained(modelname)  
tokenizer = AutoTokenizer.from_pretrained(modelname)
```

Downloading: 100%	508/508 [00:00<00:00, 7.96kB/s]
Downloading: 100%	433M/433M [00:19<00:00, 28.1MB/s]
Downloading: 100%	152/152 [00:00<00:00, 1.40kB/s]
Downloading: 100%	213k/213k [00:00<00:00, 548kB/s]
Downloading: 100%	112/112 [00:00<00:00, 609B/s]



```
nlp = pipeline('question-answering', model=model, tokenizer=tokenizer)
```

```

context = "Precipitation is moisture that falls onto the land surface as rain, dew, snow or hail. Rain is dro
context += "Acid rain – Rain with a higher than normal acid range. Caused when polluted air mixes with cloud
context += "Clean Water Act – An act passed by the U.S. Congress to control water pollution (formerly referre
context += "Dissolved oxygen – The concentration of molecular oxygen (O2) dissolved in water, usually expressi
context += "Turbidity – Indicates the degree to which light is scattered in water by suspended particulate ma
context += "Marine pollution occurs when harmful effects result from the entry into the ocean of chemi
context += "Water pollution may be analyzed through several broad categories of methods: physical,
context += "Water pollution occurs when harmful substances—often chemicals or microorganisms—contaminate a st
context += "Water is uniquely vulnerable to pollution. Known as a “universal solvent,” water is able to disso
context += "Covering about 70 percent of the earth, surface water is what fills our oceans, lakes, rivers, and
context += "When rain falls and seeps deep into the earth, filling the cracks, crevices, and porous spaces of
context += "When contamination originates from a single source, it’s called point source pollution. Examples
context += "Nonpoint source pollution is contamination derived from diffuse sources. These may include agricu
context += "It goes without saying that water pollution can’t be contained by a line on a map. Transboundary
context += "Eighty percent of ocean pollution (also called marine pollution) originates on land—whether along

```

```

nlp({
    'question': "Qué es la contaminación marina?",
    'context': context
})

```

```

{'score': 3.251834073125792e-07,
 'start': 16037,
 'end': 16046,
 'answer': 'oil spill'}

```

'question': 'What is the importance of water pollution?'

'answer': 'It provides an estimate of the muddiness or cloudiness of the water'

'question': "Cuál es la importancia de la contaminación acuática?"

'answer': 'rainfall-runoff model'

'question': "What's the name of the contamination from a single source?"

'answer': 'point source pollution'

'question': "Cuál es el nombre de la contaminación de una fuente?"

'answer': 'rainfall'

'question': "What causes pollution in water?"

'answer': 'chemicals or microorganisms'

'question': "Cuál es la causa de la contaminación en el agua?"

'answer': 'rainfall'

'question': "How do you remove water pollution?"

'answer': 'bioassays'

'question': "Cómo eliminas la contaminación del agua?"

'answer': 'rainfall-runoff model'

'question': "Can we predict rain?"

'answer': 'Rain is measured with raingauges set at standard heights above the ground surface'

'question': "Podemos predecir la lluvia?"

'answer': 'groundwater'

'question': "How does moisture affects the land?"

'answer': 'moisture that falls onto the land surface'

'question': "Cómo es que la humedad afecta la tierra?"

'answer': 'groundwater'

'question': "How I met your mother?"

'answer': '2009'

'question': "Cómo conocí a tu mamá?"

'answer': 'rainfall'

'question': "What is the precipitation percentage during winter?"

'answer': 'millimetres'

'question': "Cuál es el porcentaje de precipitación durante invierno?"

'answer': 'moisture that falls onto the land surface as rain'

'question': "How does seasons affect water?"

'answer': 'either an absence or predominance of rainfall events'

'question': "Cómo las estaciones afectan el agua?"

'answer': 'rainfall-runoff model'

'question': "What is marine pollution?"

'answer': 'ocean pollution'

'question': "Qué es la contaminación marina?"

'answer': 'oil spill'

# REPORTE

- ¿Hubo alguna diferencia?

Sí hubo diferencias por la diferencia de lenguajes

- ¿Qué lenguaje conviene más y por qué?

El lenguaje que más conviene es inglés porque el corpus está en inglés entonces entiende las preguntas mejor

- ¿Cuál era el tamaño del corpus?

El corpus era de 16760 caracteres

- ¿Cuántas respuestas tienen coherencia?

4 respuestas y media tienen coherencia pero las demás no tanto

- ¿Si cambias el corpus y preguntas lo mismo recibirá una respuesta? Demuestre

Sí porque las respuestas se basan de la información contenida en el corpus entonces estas cambian cuando se cambia la información dentro del corpus

- ¿Cuántos lenguajes puede manejar el BERT para resolver preguntas?

Solamente soporta el inglés para resolver preguntas



# REFERENCIAS

<https://arxiv.org/pdf/1810.04805.pdf>

<https://huggingface.co/deepset/bert-base-cased-squad2>

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Productos pagados de Colab - [Cancela los contratos aquí](#)

