NIRMA UNIVERSITY
INSTITUTE OF TECHNOLOGY
NAAC ACCREDITED 'A+' GRADE

BINGHAMTON UNIVERSITY
State University of New York

MINeD HACKATHON

Sponsor

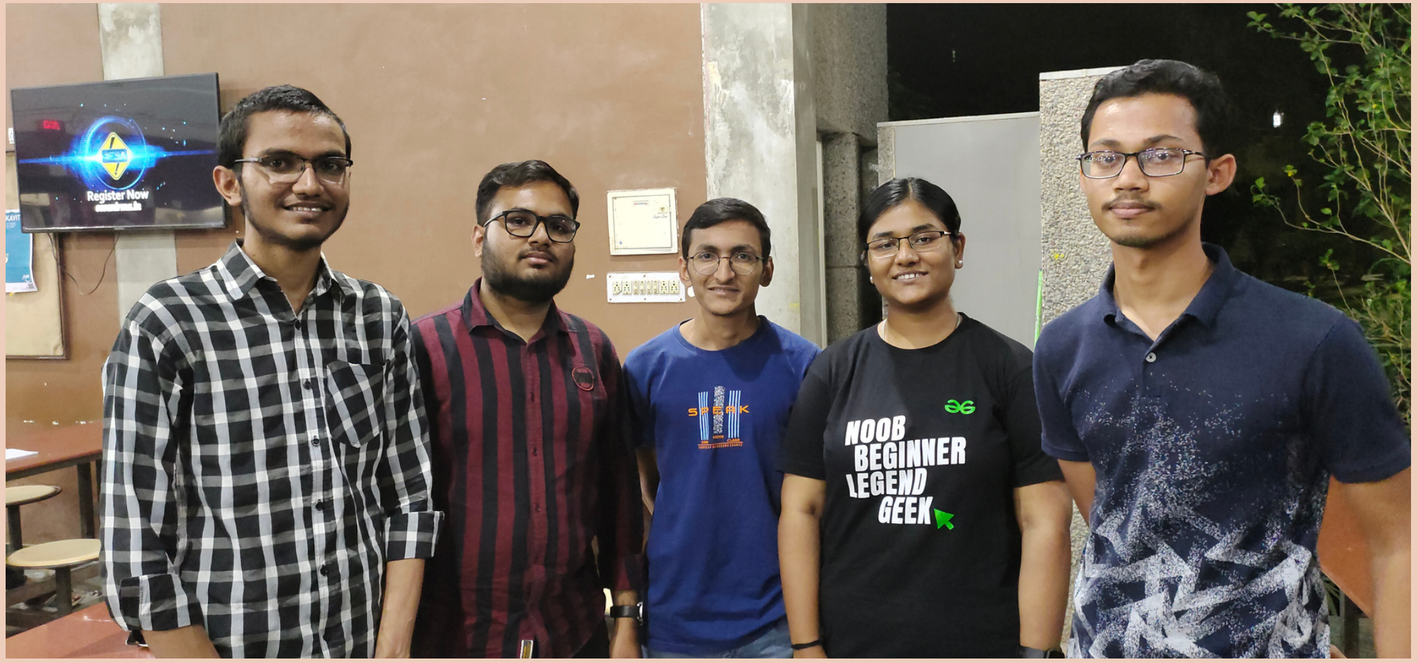
D360

Track

Querying Diamond Inventory Through ChatBots - Natural Language Processing

Team : Système D

College : Nirma University



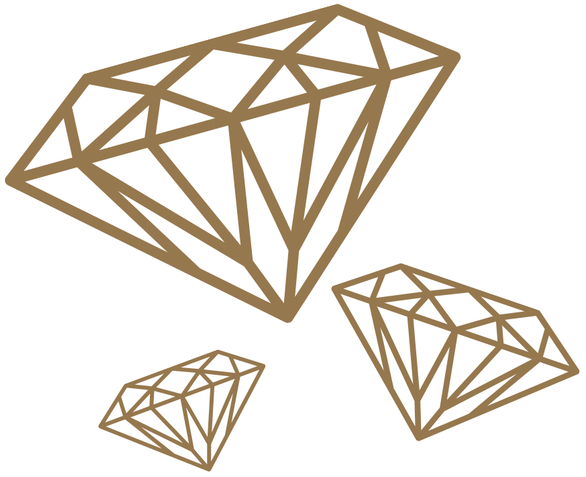
Team Members

Meet Amin | Gaurav Golchha | Bhargav Patel | Arunima Barik | Dwij Bavisi

PROBLEM STATEMENT

Create a conversational AI model using Google Dialogflow that can understand natural language queries for diamonds and generate filtering parameters for a large inventory of diamond data.

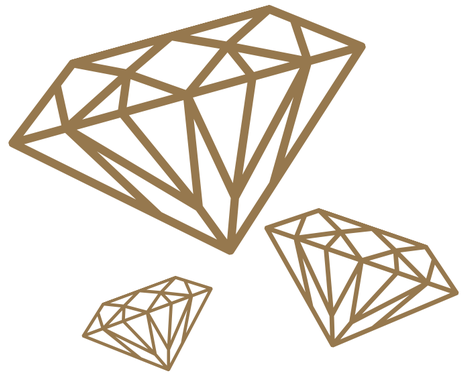
Dialogflow



Filtering parameters

shape | size | weight | clarity | color | cut

INTRODUCTION



Google Dialogflow is a **Natural Language Processing** platform which is used to develop chatbots in different languages.
It needs to be trained such that it understands diamond based user queries and returns filters based on them.

Example User Query - Can you find me RB 1.5-2ct range with VS2+ and I-K color range?

Shape - RB | **Weight -** 1.5 to 2ct | **Clarity -** VS2+ | **Color -** I to K

OUR APPROACH

1. Analysis of given dataset and dataset description
2. Parameter Identification
3. Parameter Extraction
    a. Synonyms
    b. Regular Expressions
4. Trained Dialogflow on about 200+ user queries
5. Integration with Google Co-lab

WHY TO CHOOSE THIS SOLUTION?

1. Supports synonyms for parameters

Example - Shape

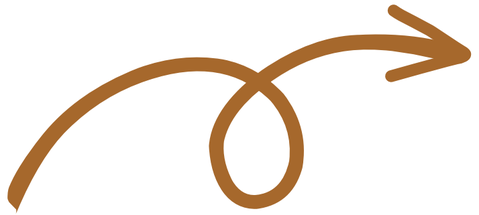
RD	ROUND, RD, R, BR, RB, ROUND BRILLIANT, ROUNDBRILLIANT, BRILLIANT, BRILLIANT CUT, BRILLIANTCUT

2. Fuzzy Matching

Supports search even for misspelt or incomplete words

3. Regular Expressions for parameters like weight and color that have range queries

Example - Color



D-F colour

/[d-z]\s*[t][o]\s*[d-z]\s*[c][o][l][o][u][r]/gmi

Example - Weight

1.2 to 2.5 ct

(\d+(\.\d+)?[ ]*(ct|carat)?)?([ ]*(\-|to)[ ]*)?\d+(\.\d+)?[ ]*(ct|carat)

LIMITATIONS

1. This chatbot supports queries only in English language.
2. This project has been made using DialogFlow ES version which supports active session of only 30 minutes. Also, it supports no more than 40 requests per session. Hence, it can not be used for commercial purposes.
3. For very typical queries, the model might give an output of lesser accuracy.

DEMONSTRATION

```
1 query()
```

```
Enter a query to be processed:
Can you show me a single pear shaped diamond with 1.75 ct to 2carat weight, SI1 clarity, DEF color, and Very Good cut?
------------------------------------------------------------
Dialogflow generated the following filter:

        Columns = ['SHAPE', 'COLOR', 'FLUOR', 'PURITY', 'WEIGHT', 'CUT', 'POLISH', 'SYMN', 'MES1', 'MES2', 'MES3', 'TABLE', 'DEPTHPER', 'PRICE/CTS',
        Shape = ['PS']
        Color = [['D', 'E', 'F']]
        Clarity = ['SI1']
        Weight = [[1.75, 2.0]]
        Cut = ['VG']
```

```
1 query()
```

```
Enter a query to be processed:
Can you show me a single pear shaped diamond with 1.75 ct weight, SI1 clarity, D-H color, and Very Good cut?
------------------------------------------------------------
Dialogflow generated the following filter:

        Columns = ['SHAPE', 'COLOR', 'FLUOR', 'PURITY', 'WEIGHT', 'CUT', 'POLISH', 'SYMNMES1', 'MES2', 'MES3', 'TABLE', 'DEPTHPER', 'PRICE/CTS',
        Shape = ['PS']
        Color = [['D', 'E', 'F', 'G', 'H']]
        Clarity = ['SI1']
        Weight = [[1.6, 1.9]]
        Cut = ['VG']
```

REFERENCES

1. Problem Statement and Description provided by the Sponsor

2. **Google DialogFlow ES Documentation** - https://cloud.google.com/dialogflow/es/docs