# Automated Factoid QA System on SQuAD Dataset

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### Task

- A Paragraph Consist Many Question and Each Question Consist Many Answer. My Task is,
  - Find the best possible answer of a **Factoid Question** in the given paragraph. For example,

Super Bowl 50 was an American football game to determine the champion of the National Football League (NFL) for the 2015 season. The American Football Conference (AFC) champion Derivel Bionico defeated the National Football Conference (NFC) champion Carolina Panthers 24w201310 to earn their third Super Bowl title. The game was played on February 7, 2016, at Levi's Stadium in the San Francisco Bay Area at Santa Clara, California. As this was the 50th Super Bowl, the league emphasized the "golden anniversary" with various gold-themed initiatives, as well as temporarily suspending the tradition of naming each Super Bowl game with Roman numerals (under which the game would have been known as \"Super Bowl L\"), so that the logo could prominently feature the Arabic numerals 50.

Who won Super Bowl 50? Denver Broncos

What day was the Super Bowl played on? February 7, 2016

**Figure 1:** Question-answer pairs for a sample passage in the SQuAD dataset. Each of the answers is a seament of text from the passage.



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# Dataset Description

• For My Project, Used SQuAD Dataset. This is in a JSON formate.

```
{"data": [{"title": "Super Bowl 50", "paragraph
football game to determine the champion of the
The American Football Conference (AFC) champion
Conference (NFC) champion Carolina Panthers 24\
game was played on February 7, 2016, at Levi's :
California. As this was the 50th Super Bowl, the
various gold-themed initiatives, as well as tem
Super Bowl game with Roman numerals (under which
L\"), so that the logo could prominently feature
[{"answer start": 177, "text": "Denver Broncos"
{"answer start": 177, "text": "Denver Broncos"}
```

# Dataset Prepossessing-I

• After Prepossessing of SQuAD Dataset, I got Passages in the text formate.

 Super Bowl 50 was an American football League (NFL) for the 2015 season. The Amer defeated the National Football Conference third Super Bowl title. The game was playe Francisco Bay Area at Santa Clara, Califor emphasized the \"golden anniversary\" with suspending the tradition of naming each Su would have been known as \"Super Bowl L\") numerals 50.

# Dataset Prepossessing-II

• After Prepossessing of SQuAD Dataset, I got QuestionAndAnswer in the text formate.

```
12) Who won Super Bowl 50
12.1) Denver Broncos
12.2) Denver Broncos
12.3) Denver Broncos
```

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# System Architecture

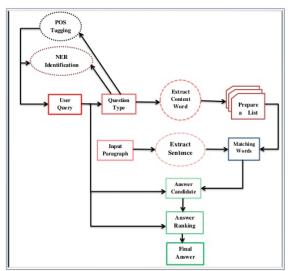


Figure 1.1: System Architecture

# Components

- Question Types Identification
- Prepare a list of content word
- Input Paragraph
- Matching Word Module
- Answer candidate
- Answer Ranking
- Final Answer

# User Query

- When user enter query, my system first identify **NER** and **POS** Tagging that query. A snippet listed below from my system result.
  - User Query

Who won Super Bowl 50

• NER Identification

Who/0 won/0 Super/0 Bowl/0 50/0

POS Tagging

Who WP won VBD Super NNP Bowl NNP 50 CD

# Question Types

• Question Types identification is one of the major challenging task of QA system. Because A Question types has lots of ambiguity. A table is listed below identification of question types.

Wh-Word	Question Types
Who, Whose, Whom	Person_Type_Question
Where	Location_Type_Question
Which	Organization_Type_Question
How (few, little, much)	Quantity_Type_Question
How (long, old)	Time_Type_Question
What, When	Time_Type_Question

Figure 1.2 : Question Types Identification

# Question Types-I

• User Query

# Who won Super Bowl 50

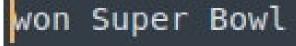
• Question Types Identification

Person\_Type\_Question

### List of Content Word

- A snippet is listed below of content word.
  - User Query after POS Tagging

• Content Word Extraction From Query



# Input Paragraph

• A Simple of Paragraph is listed below.

Super Bowl 50 was an American football game to determine the cham League (NFL) for the 2015 season. The American Football Conference defeated the National Football Conference (NFC) champion Carolina third Super Bowl title. The game was played on February 7, 2016, a Francisco Bay Area at Santa Clara, California. As this was the 50the \"golden anniversary\" with various gold-themed initiatives, the tradition of naming each Super Bowl game with Roman numerals been known as \"Super Bowl L\"), so that the logo could prominent

### Sentence Extraction

- Sentence Extraction Based on Content Word Matching
  - Extracted Sentence

```
Super Bowl 50 was an American football game to determine the champion of the National Football League (NFL) for the 2015 season 2

The American Football Conference (AFC) champion Denver Broncos defeated the National Football Conference (NFC) champion Carolina Panthers 24\u201310 to earn their third Super Bowl title 2

The game was played on February 7, 2016, at Levi's Stadium in the San Francisco Bay Area at Santa Clara, California 0

As this was the 50th Super Bowl, the league emphasized the \"golden anniversary\" with various gold-themed initiatives, as well as temporarily suspending the tradition of naming each Super Bow game with Roman numerals (under which the game would have been known as \"Super Bowl L\"), so that the logo could prominently feature the Arabic numerals 50
```

### **Answer Candidate**

- Work of Answer Candidate is find answer in the top most sentence based on the Question Types.
  - Max Score Sentence Extraction

As this was the 50th Super Bowl, the league emphasized the \"g gold-themed initiatives, as well as temporarily suspending the game with Roman numerals (under which the game would have been the logo could prominently feature the Arabic numerals 50 Score: 2

The American Football Conference (AFC) champion Denver Broncos Conference (NFC) champion Carolina Panthers 24\u201310 to earn Score: 2

# Answer Ranking

- If we get multiple answer then work of Answer Ranking is rank the answer based on the question types and find the only one best answer.
  - Answer Ranking



### Final Answer

- In the Final Answer Module, We get only one answer.
  - Final Answer

# Denver Broncos

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### Further Tasks

- As of now, my System is limited only to some question types. I am planning to develop my system in such a way that, it will produce accurate answers to any of the questions in my data-set.
- To a single answer, my system produces correct answers. But for a question with multiple answers, based on the question type we will produce our final answer.

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### references

- https://rajpurkar.io/SQuAD-explorer/
- https://en.wikipedia.org/wiki/Question-answering



# Thank You!

