

# NLP – Assignment – Akaike – Creation of MCA using Generative AI Technique by Kavibarathi K

## Problem Statement:

Creation of Objective Questions with Multiple Correct Answers using generative text models.

## Objectives:

The goal of this internship assignment is to test your proficiency in natural language processing. You will be tasked with developing a solution that can automatically generate objective questions with multiple correct answers based on a given chapter from a subject. The generated questions should test the reader's understanding of the chapter and have more than one possible correct answer to increase the complexity and challenge of the questions. The generated questions should not only test the reader's comprehension of the chapter but also encourage them to think beyond the surface level and explore different perspectives and possibilities. Ultimately, the objective of this project is to develop a robust and accurate solution that can aid educators in creating engaging and challenging assessments for their students.

## Necessary Libraries:

```
# importing libraries that are necessary
import spacy
import random
# !python -m spacy download en_core_web_sm # python package to be downloaded for text processing
```

## Creating text processing model using Spacy:

Spacy is an NLP frame or library used for processing the textual data and for manipulating the data and process it .

```
# creating object for loading the english language model
nlp = spacy.load("en_core_web_sm")
```

## Defining function to take input:

Defines a function block that will take textual data from user.

```
# function to get text as input and no of questions
def get_mca_questions(context: str, num_of_questions):
    doc = nlp(context)
    # function block for generating the mcq question format
```

Defining a function to generate question, options and correct answers:

```
# function block for gerating the mcq question format
def generate_mcq_with_multiple_ans(question, correct_ans, options, num_of_options=4):
    options = correct_ans + options
    random.shuffle(options)

    mcqs = {
        "question": question,
        "options": options,
        "correct_answers": correct_ans
    }

    return mcqs
```

Defining function block to generate multiple question, options and answers from the input text:

This block of code will break the paragraph into several lines of sentence and then process it into questions , with blank space for answers and a correct answers.

```
# function block to generate question,options and correct answers
def generate_variety_question():
    sentence = random.choice(list(doc.sents))
    blank_word = random.choice([token for token in sentence if not token.is_punct])

    question_text = sentence.text.replace(blank_word.text, " ____ ")
    correct_answers = [blank_word.text]

    other_options = [token.text for token in doc if token.is_alpha and token.text != correct_answers[0]]
    num_correct_options = random.randint(1, 2) # Generate 1 or 2 correct options
    correct_answers.extend(random.sample(other_options, num_correct_options))

    num_other_options = min(4 - num_correct_options, len(other_options))
    other_options = random.sample(other_options, num_other_options)

    mcq = generate_mcq_with_multiple_ans(question_text, correct_answers, other_options)
    return mcq

questions = [generate_variety_question() for _ in range(num_of_questions)]
```

For loop for iterating no of times to get questions along with options:

```
mca_questions = []
# iterating over the question ,option and coorects ans
for i, question in enumerate(questions, start=1):
    question_txt = f"Question{i}: {question['question']}\n"
    options_txt = ""
    for j, option in enumerate(question['options']):
        options_txt += f"{j+1}. {option}\n"

    correct_options = " , ".join([f"({chr(97+question['options'].index(ans))})" for ans in question['correct_answers']])
    correct_options_str = f"Correct Options: {correct_options}"

    mca_question = f"{question_txt}{options_txt}{correct_options_str}\n"
    mca_questions.append(mca_question)
return mca_questions
```

Another for loop for printing the questions generated one by one:

```
# iterating thurgh the total question one by one and printing it
context = input("Enter the paragraph: ")
num_of_questions = int(input("Enter the number of questions: "))
mca_questions = get_mca_questions(context, num_of_questions)
for question in mca_questions:
    print(question)
```

## Solutions or Questions generated :

Enter the paragraph: In 1600, the East India Company acquired a charter from the ruler of England, Queen Elizabeth I, granting it the sole right to trade with the East. This meant that no other trading group in England could compete with the East India Company. With this charter, the Company could venture across the oceans, looking for new lands from which it could buy goods at a cheap price, and carry them back to Europe to sell at higher prices. The Company did not have to fear competition from other English trading companies. Mercantile trading companies in those days made profit primarily by excluding competition, so that they could buy cheap and sell dear. The royal charter, however, could not prevent other European powers from entering the Eastern markets. By the time the first English ships sailed down the west coast of Africa, round the Cape of Good Hope, and crossed the Indian Ocean, the Portuguese had already established their presence in the western coast of India, and had their base in Goa. In fact, it was Vasco da Gama, a Portuguese explorer, who had discovered this sea route to India in 1498. By the early seventeenth century, the Dutch too were exploring the possibilities of trade in the Indian Ocean. Soon the French traders arrived on the scene.

Enter the number of questions: 5

Question1: By the time the first English ships sailed down the west coast of Africa, round the Cape of Good Hope, and crossed the Indian Ocean, the Portuguese had already established their presence in the western coast of India, and had their \_\_\_\_\_ in Goa.

1. acquired
2. European
3. the
4. I
5. base

Correct Options: (e) , (b) , (c)

Question2: In 1600, the East India Company acquired a charter from the ruler \_\_\_\_\_ England, Queen Elizabeth I, granting it the sole right to trade with the East.

1. base
2. from
3. of
4. Queen
5. Company

Correct Options: (c) , (e)

## Conclusion:

This python code will take a textual paragraph or line and process it and generate multiple questions with multiple answers automatically with help spacy library. Further we can use OPEN AI API key to generate this type of models and along with that there are several other large language models like langchain are very useful in text generative models.