Objective

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.

Generate MCQ using the spacy library

- This code generates multiple-choice questions (MCQs) based on a given context paragraph using the Spacy library. The MCQs are designed to have multiple correct answer choices for added variety. The generated MCQs are then displayed to the user

Import necessary libraries

- Import spacy
- Import random

Final code with desired output

```
import spacy
import random


nlp = spacy.load("en_core_web_sm")

def get_mca_questions(context: str, num_questions: int):
    doc = nlp(context)

    def generate_mcq_queries(question, correct_answers, other_options, 
num_options=4):
        options = correct_answers + other_options
        random.shuffle(options)

        mcq = {
            "question": question,
            "options": options,
            "correct_answers": correct_answers
        }

        return mcq

    def generate_variable_question():
        text = random.choice(list(doc.sents))
        blank_word = random.choice([token for token in text if not 
token.is_punct])

        question_text = text.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]]
        number_correct_options = random.randint(1, 2)
        correct_answers.extend(random.sample(other_options, 
number_correct_options))

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

        mcq = generate_mcq_queries(question_text, correct_answers, 
other_options)
        return mcq
```

```
    questions = [generate_variable_question() for _ in
range(num_questions)]

    mca_questions = []
    for i, question in enumerate(questions, start=1):
        question_str = f"Q{i}: {question['question']}\n"
        options_str = ""
        for j, option in enumerate(question['options']):
            options_str += f"{j+1}. {option}\n"

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

        mca_question =
f"{question_str}{options_str}{correct_options_str}\n"
        mca_questions.append(mca_question)

    return mca_questions

context = input("Enter the paragraph: ")
num_questions = int(input("Enter the number of questions: "))
mca_questions = get_mca_questions(context, num_questions)
for question in mca_questions:
    print(question)
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Enter the paragraph: Halley's Comet, Comet Halley, or sometimes simply
Halley, officially designated 1P/Halley, is a short-period comet
visible from Earth every 75–79 years.[1] Halley is the only known
short-period comet that is regularly visible to the naked eye from
Earth, and thus the only naked-eye comet that can appear twice in a
human lifetime.[15] It last appeared in the inner parts of the Solar
System in 1986 and will next appear in mid-2061.  Halley's periodic
returns to the inner Solar System have been observed and recorded by
astronomers around the world since at least 240 BC. But it was not
until 1705 that the English astronomer Edmond Halley understood that
these appearances were re-appearances of the same comet. As a result of
this discovery, the comet is named after Edmond Halley.[16]  During its
1986 visit to the inner Solar System, Halley's Comet became the first
comet to be observed in detail by spacecraft, providing the first
observational data on the structure of a comet nucleus and the
mechanism of coma and tail formation.[17][18] These observations
supported a number of longstanding hypotheses about comet construction,
particularly Fred Whipple's "dirty snowball" model, which correctly
predicted that Halley would be composed of a mixture of volatile ices—
such as water, carbon dioxide, ammonia, and dust. The missions also
provided data that substantially reformed and reconfigured these ideas;
for instance, it is now understood that the surface of Halley is
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largely composed of dusty, non-volatile materials, and that only a small portion of it is icy. Pronunciation Comet Halley is commonly pronounced /ˈhæli/, rhyming with valley, or /ˈheɪli/, rhyming with daily.[19][20] Colin Ronan, one of Edmond Halley's biographers, preferred /ˈhɔːli/, rhyming with crawly.[21] Spellings of Halley's name during his lifetime included Hailey, Haley, Hayley, Halley, Hawley, and Hawly, so its contemporary pronunciation is uncertain, but the version rhyming with valley seems to be preferred by current bearers of the surname.[22] Computation of orbit The orbital path of Halley, against the orbits of the planets (animation) Halley was the first comet to be recognized as periodic. Until the Renaissance, the philosophical consensus on the nature of comets, promoted by Aristotle, was that they were disturbances in Earth's atmosphere. This idea was disproved in 1577 by Tycho Brahe, who used parallax measurements to show that comets must lie beyond the Moon. Many were still unconvinced that comets orbited the Sun, and assumed instead that they must follow straight paths through the Solar System.[23] In 1687, Sir Isaac Newton published his Philosophiæ Naturalis Principia Mathematica, in which he outlined his laws of gravity and motion. His work on comets was decidedly incomplete. Although he had suspected that two comets that had appeared in succession in 1680 and 1681 were the same comet before and after passing behind the Sun (he was later found to be correct; see Newton's Comet),[24] he was unable to completely reconcile comets into his model. Ultimately, it was Newton's friend, editor and publisher, Edmond Halley, who, in his 1705 Synopsis of the Astronomy of Comets, used Newton's new laws to calculate the gravitational effects of Jupiter and Saturn on cometary orbits.[25] Having compiled a list of 24 comet observations, he calculated that the orbital elements of a second comet that had appeared in 1682 were nearly the same as those of two comets that had appeared in 1531 (observed by Petrus Apianus) and 1607 (observed by Johannes Kepler).[25][26] Halley thus concluded that all three comets were, in fact, the same object returning about every 76 years, a period that has since been found to vary between 74 and 79 years. After a rough estimate of the perturbations the comet would sustain from the gravitational attraction of the planets, he predicted its return for 1758.[27] While he had personally observed the comet around perihelion in September 1682,[28] Halley died in 1742 before he could observe its predicted return.[29] Halley's prediction of the comet's return proved to be correct, although it was not seen until 25 December 1758, by Johann Georg Palitzsch, a German farmer and amateur astronomer. It did not pass through its perihelion until 13 March 1759, the attraction of Jupiter and Saturn having caused a retardation of 618 days.[30] This effect was computed before its return (with a one-month error to 13 April)[31] by a team of three French mathematicians, Alexis Clairaut, Joseph Lalande, and Nicole-Reine Lepaute.[32] The confirmation of the comet's return was the first time anything other than planets had been shown to orbit the Sun. It was also one of the earliest successful tests of Newtonian physics, and a clear demonstration of its explanatory power.[33] The comet was first named in Halley's honour by French astronomer Nicolas-Louis de Lacaille in 1759.[33] Some scholars have proposed that first-century Mesopotamian astronomers already had recognized Halley's Comet as periodic.[34] This theory notes a passage in the Babylonian Talmud, tractate Horayot[35] that refers to "a star which appears once in seventy years that makes the captains of the ships err."[36] Researchers in 1981 attempting to calculate the past orbits of Halley by numerical integration starting from accurate observations in the seventeenth and eighteenth centuries could not produce accurate results further back than 837 owing to a close approach to Earth in that year. It was necessary to use ancient Chinese comet observations to constrain their calculations.[37] Orbit and origin Halley's orbital period has varied between 74 and 79 years since 240 BC.[33][38] Its orbit around the Sun is highly elliptical, with an orbital eccentricity of 0.967 (with 0 being a circle and 1 being a parabolic trajectory). The perihelion, the point in the comet's orbit when it is nearest the Sun, is 0.59 au (88 million km). This is between the orbits of Mercury and Venus. Its aphelion, or farthest distance from the Sun, is 35 au (5.2 billion km) (roughly the distance of Pluto). Unusual for an object in the Solar System, Halley's orbit is retrograde; it orbits the Sun in the opposite direction to the planets, or, clockwise from above the Sun's north pole. The orbit is inclined by 18° to the ecliptic, with much of it lying south of the ecliptic. (Because it is retrograde, the true inclination is 162°.)[39] Owing to the retrograde orbit, it has one of the highest velocities relative to the Earth of any object in the Solar System. The 1910 passage was at a relative velocity of 70.56 km/s (157,800 mph).[7] Because its orbit comes close to Earth's in two places, Halley is associated with two meteor showers: the Eta Aquariids in early May, and the Orionids in late October.[40] Halley is the parent body to the Orionids, while observations conducted around the time of Halley's appearance in 1986 suggested that the comet could additionally perturb the Eta Aquariids, although it might not be the parent of that shower.[41] Orionid meteor originating from Halley's Comet streaking the sky below the Milky Way and to the right of Venus Halley is classified as a periodic or short-period comet; one with an orbit lasting 200 years or less.[42] This contrasts it with long-period comets, whose orbits last for thousands of years. Periodic comets have an average inclination to the ecliptic of only ten degrees, and an orbital period of just 6.5 years, so Halley's orbit is atypical.[33] Most short-period comets (those with orbital periods shorter than 20 years and inclinations of 20–30 degrees or less) are called Jupiter-family comets. Those resembling Halley, with orbital periods of between 20 and 200 years and inclinations extending from zero to more than 90 degrees, are called Halley-type comets.[42][43] As of 2015, only 75 Halley-type comets have been observed, compared with 511 identified Jupiter-family comets.[44] The orbits of the Halley-type comets suggest that they were originally long-period comets whose orbits were perturbed by the gravity of the giant planets and directed into the inner Solar System.[42] If Halley was once a long-period comet, it is likely to have originated in the Oort cloud,[43] a sphere of cometary bodies around 20,000–50,000 au from the Sun. Conversely the Jupiter-family comets are generally believed to originate in the Kuiper belt,[43] a flat disc of icy debris between 30 au (Neptune's orbit) and 50 au from the Sun (in the scattered disc). Another point of origin for the Halley-type comets was proposed in 2008, when a trans-Neptunian object with a retrograde orbit similar to Halley's was discovered, 2008 KV42, whose orbit takes it from just outside that of Uranus to twice the distance of Pluto. It may be a member of a new population of small Solar System bodies that serves as the source of Halley-type comets.[45] Halley has probably been in its current orbit for 16,000–200,000 years, although it is not possible to numerically integrate its orbit for more than a few tens of apparitions, and close approaches before 837 AD can only be verified from recorded observations.[46] The non-gravitational effects can be crucial;[46] as Halley approaches the Sun, it expels jets of sublimating gas from its surface, which knock it very slightly off its orbital path. These orbital changes cause delays in its perihelion of four days on average.[47] In 1989, Boris Chirikov and Vitold

Vecheslavov performed an analysis of 46 apparitions of Halley's Comet taken from historical records and computer simulations. These studies showed that its dynamics were chaotic and unpredictable on long timescales.[48] Halley's projected lifetime could be as long as 10 million years. These studies also showed that many physical properties of Halley's Comet dynamics can be approximately described by a simple symplectic map, known as the Kepler map.[49] More recent work suggests that Halley will evaporate, or split in two, within the next few tens of thousands of years, or will be ejected from the Solar System within a few hundred thousand years.[50][43] Observations by D. W. Hughes suggest that Halley's nucleus has been reduced in mass by 80 to 90% over the last 2,000 to 3,000 revolutions.[18]
Enter the number of questions: 5
Q1: Until the Renaissance, the philosophical consensus on the nature of comets, promoted ______ Aristotle, was that they were disturbances in Earth's atmosphere.
1. sometimes
2. by
3. French
4. As
5. work
Correct Options: (b) & (a)

Q2: The 1910 passage was at a relative velocity of ______ km/s (157,800 mph).[7] Because its orbit comes close to Earth's in two places, Halley is associated with two meteor showers: the Eta Aquariids in early May, and the Orionids in late October.[40]
1. predicted
2. of
3. than
4. 70.56
5. orbital
Correct Options: (d) & (c) & (e)

Q3: Halley died in 1742 before he could observe its predicted return.[29] Halley's prediction of the comet's return proved to be correct, although it was not ______ until 25 December 1758, by Johann Georg Palitzsch, a German farmer and amateur astronomer.
1. small
2. a
3. Solar
4. seen
5. inclination
Correct Options: (d) & (a)

Q4: His work ______ comets was decidedly incomplete.
1. on
2. numerically
3. Halley
4. is
5. a
Correct Options: (a) & (b)

Q5: Researchers ______ 1981 attempt______g to calculate the past orbits of Halley by numerical ______tegration start______g from accurate observations ______ the seventeenth and eighteenth centuries could not produce accurate results further back than 837 ow______g to a close approach to Earth ______ that year.

1. in
2. with
3. System
4. who
5. comets

Correct Options: (a) & (c)