CMSC470 Final: Adversarial Questions

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Table of Contents

Important Notes

- The .json file we have has the "answer" field in the format of a list for every answer to keep consistency
  - Single responses – ['osu!']
  - Multiple responses – ["Accident, Maryland", "Accident"]
- The presentation video can be found after the "Analysis / Summary" section in bold

Analysis / Summary

Our initial proposal was to have each of the four group members contribute to the various topics, where each of us would do at least one question for each category available. The method proposed for writing questions was to have unique subcategories to write about within each of the given overarching topics. For example, within the "Art" category, we chose various paintings and painters from different countries. We followed this idea for the rest of our questions in terms of creating our unique questions. The way we further organized questions is a little different however, as we tried to implement as many techniques that we learned about for creating adversarial questions. For example, our "Literature" section makes use of many techniques such as multi-hop, common link, as well as common sense and misdirection. These techniques were applied in different ways, which was what we had desired, for each of the unique topics. One of our questions would apply a common link to chain together a common author between books, or even try to misdirect Chat-GPT and other AI into thinking the book in question was different. This plan was initially a good idea, as we could create unique questions using different techniques, even combining techniques at times. The combination of techniques would allow for some questions to take facts that AI and Chat-GPT could know, and trick them into guessing the wrong answer even when the facts were stated in various Wikipedia articles.

There were some struggles in terms of trying to have entirely unique question topics and techniques used, as many of our questions did end up having to reuse similar techniques even within the same categories. A clear example of this can be seen in our "Science" category. Many of the questions ended up relating to the application of mathematics based questions for AI and Chat-GPT to solve, as many of the clues and hints for the answers of our questions required the use of math to even describe our answer in detail. For example, one of our questions mentioned the specifics about the Rolle's Theorem, which required logical reasoning and mathematics to understand the requirements behind the theorem. Similarly, our question about kinematics and jerk used mathematics and its jargon when mentioning the integral. In both cases, the use of math was crucial for the explanation of our answers, which is why we ended up having to scrap the idea of entirely unique questions and techniques. This worked out in our favor, as many other questions we created would also require similar techniques, as questions in the "History" category would end up requiring a mixture of many techniques due to Chat-GPT and Bing AI's ability to answer historical questions easily.

Our initial plan for writing questions was to have forty to fifty questions completed so that we could cross analyze one anothers' questions. This plan fell apart however, as our group lacked sufficient time due to course load and outside factors, which led to the completion of approximately half of the fifty questions by the time the first milestone was set. Within the group, Richie and Joseph had primarily worked on the initial twenty-five questions, while Mili and Philip focused on analyzing the questions. Mili and Philip did write a few questions to start out, but primarily focused on trying to perfect the initial twenty-five questions for the milestone submission. Richie and Joseph's starting questions revolved primarily around different regions of the world and their cultures, one of which is Japan. Many of our questions seek to expand the question answering system capabilities by probing the systems about Japanese culture, sport, and entertainment in the form of manga, anime, virtual YouTubers, and more. Mili and Philip on the other hand, focused on checking for vagueness of the question, cross-checking responses and results from Chat-GPT to Bing AI, as well as providing suggestions on how to improve current questions. In the latter half, Mili and Philip focused on writing their portion of the questions, while Richie and Joseph analyzed the questions for the same vagueness and responses. The plan simply resulted in this methodology, as course loads and time available were vastly different between group members, and this was our most effective plan to complete the questions and analysis.

In terms of evaluating questions, our group came up with a system where during the analysis of our questions for vagueness, we would try to search for similar ideas or nouns that would fit the description of the hints given. A great example of this is in the Pascal's Triangle question under the "Science" category. Originally, the question was formatted in a manner which applied to the answers of both Pascal's Triangle, as well as the Binomial Theorem. This was a major issue, as the vagueness in the question could result in either of the answers being correct; which led to the change which forced the name of the mathematical concept to include a polygon in the form of a triangle. Another part of evaluating questions was to check for the vagueness of the actual question itself, and whether or not the question was too vague in its wording. A great example of this was found in the "Literature" category when mentioning Dr. Seuss' book, "One Fish, Two Fish, Red Fish, Blue Fish." The question was originally too vague, as after describing "The Lorax" by Dr. Seuss, the wording of the question continued to mention "this book." The mention of "this book" after bringing up "The Lorax" is too vague and ambiguous in terms of which book is being referenced, and resulted in the confusion to even humans who thought the book was "The Lorax" instead of the book in question from the first statement of the question. These common mistakes led to the evaluation process to take longer than expected, as many other questions had similar issues with vagueness and ambiguity in terms of wording.

This plan for evaluation worked, as further review of questions resulted in the correction of many questions in terms of their vagueness. Many of our corrected questions now have a consistent format, where the question goes from broadly introducing the topic of our answer, and then gives hints to further allow the guessers to hone in on the answer. Our group split up into the pairs previously mentioned and analyzed the other pair's questions for vagueness and ambiguity. However, there were some questions to note that may not have been the best in terms of their contents and the answer being written about. One of the techniques for adversarial questioning is the use of current events to hint the guessers towards a final answer, but a few of our questions may have events that are too current for most humans to even answer. The answer in question falls under the "Lifestyle" category, and is about a newly released game. This newly released game could potentially be too new to the point where rarely any humans could possibly answer the questions, let alone Bing AI and Chat-GPT trying to guess correctly.

In terms of the results of the questions, especially when comparing to Chat-GPT, our group cross-checked each others' questions to ensure that any newly added hints in the question would not simply give away the answer. This was our plan, especially during the first half of question writing, where we struggled to grasp the structure of questions. Many of our starting questions were not formulated well, and caused the hints in the question to allow Chat-GPT and Bing AI to easily guess the answer while in the middle of the question. As a result, our group would periodically check both the pyramidal and OQL questions created to ensure neither Chat-GPT nor Bing AI consistently gets the question correct.

This plan worked, as our questions have been essentially double checked by the other group members who did not write those questions. The inclusion of multiple perspectives allowed for more insight on how vague or specific the questions are, as well as possible ways to improve the quality of the question being asked. This resulted in a majority of the questions being able to stump Chat-GPT and Bing AI, while allowing for the possibility for humans to answer the questions from creating logical jumps combined with common sense a majority of the time.

On some occasions, Chat-GPT would guess exactly what we got, or guess close to the answer. Chat-GPT, without having a clear answer, will tend to ramble about the questions being asked sequentially. As a result, some of our questions, such as our Salem witch trials question under "History," can occasionally be answered by Chat-GPT and Bing AI. This question, among many others, apply the various techniques when creating adversarial questions. However, due to the sheer amount of information regarding their topics, both Chat-GPT and Bing AI can sometimes correctly identify the answer on first guess. This is primarily due to the last hints being given to most questions, where the hint leads the guessers straight into the answer for some questions. The flaw is pretty noticeable in our Salem witch trials question, where the final hint is that "a popular online game" exists which "begins with 'Town of,'" and can easily be traced back to the Town of Salem game revolved around its historical witch trials. These questions were marked off with special remarks based on what Chat-GPT and Bing AI responded with, whether they correctly guessed the answer with additional hints, rambled on about the questions sequentially, or refused to answer. We believe that the refusal to answer some questions by Bing AI outsides the ability to make a confident guess, but have the answer incorrect, as incorrect answers bring doubt upon a system and its capabilities.

To summarize, our initial proposal was an overestimate of our group's ability to complete nearly all of the questions by the first milestone. However, through the distribution of work, as well as the use of various techniques advised from the peers, we were able to create fifty unique questions which all fall under one of the nine chosen OQL categories. Our questions all use one or more techniques for creating adversarial questions, some even combining multiple together, and the techniques worked for the most part. There were some roadblocks along the way, especially with the vagueness and ambiguity of some questions, but communication and our group's methodology of reviewing each other's questions resolved these issues. In the end, our group managed to successfully create fifty unique questions, most of which are not related to english-speaking areas. We hope that our questions serve as a step towards the expansion of question and answering systems towards a more international scope through the inclusion of questions about other cultures and international entertainment.

Video Link:
https://github.com/MiliGupta12/Adversarial-Questions-for-ChatGPT-and-BingAI/blob/main/AnalysisVideo.mp4

Art

Q1 (Chinese Painter)

Pyramidal: Born during the Tang dynasty, this painter was granted the title jìn guó gōng during the third reign of Dé zōng. This painter is accredited with the creation of the earliest paper scroll painting. This painter had three plus one plus one brothers and is most famous for creating a painting on white hemp paper, depicting several of the same type of animals, each as a reference to one of his male siblings. Besides a small bare tree on the right side of the painting, this painter includes no background in the painting and only includes a horizontal lineup of several different bulls. Name this painter who created the famous Chinese painting known as Wǔ Niú Tú and also accredited with the painting Wényuàn Tú.

OQL: Name this famous Chinese painter who was most known for creating a painting depicting a line up of several different male cows, each as a reference to one of his brothers. This painter had three plus one plus one brothers.

Answer: Han Huang

Explaining the Answer

Han Huang was born during the Tang dynasty and given the tile 晋国公 (jìn guó gōng) by emperor Dezong [B1]. He is well known for painting the famous painting, 五牛图 (Wǔ Niú Tú) or Five Bulls, which is also the earliest paper scroll painting [B3]. Han Huang had five brothers, and the painting itself depicts a different type of bull (male cow) for each of the brothers. Besides some inscriptions, the only things in the painting are the bulls and a shrub [B2]. Han Huang is also accredit for painting 文苑图 (Wényuàn Tú), although this is not as popular as the Five Bulls painting.

Why is it Interesting?

The question asks about a painter from Ancient China whose works are among the most famous paintings handed down from Ancient China [B4]. The painting that is referenced in the question is part of the Palace Museum in Beijing,which is one of the most prestigious museums in China and the world [B5].

Why is it Pyramidal?

The first sentence gives a very obscure fact of a title he received, but gives enough information to give an answer such as the time period. The second sentence is a fact more well known than the first, but still fairly niche. The third sentence talks about the famous painting he made without revealing what type of animal it is, although you can pretty much infer what it is because of the time period given. The fourth sentence makes it easier giving the exact animal, and the fifth sentence is the easiest as it literally tells you the names of the paintings he made.

Why is it Hard (for computers)?

This question focuses on Chinese culture, but many QA datasets are trained on English datasets, making it more biased toward english-speaking cultures [A2]. While the Han Huang and the painting Wǔ Niú Tú may not be very well known in America unlike DaVinci and the Mona Lisa, it is well known in China, so it systems may not know much about historical Chinese paintings. There is also some common sense in the question, which some systems may struggle with [A1]. For example, the painter has five brothers, and the painting shows a bull for each brother. Then the painting must have five bulls, which is easy for a human to get, but sometimes not for a computer.

QA System Answers

Chat-GPT: Zhōu Fǎng (pyramidal), Xú Bēihóng (OQL)

Bing: Hán Gàn (pyramidal, until last sentence), Zhào Mèngfǔ (OQL)

Q2 (Fresco)

Pyramidal: This piece of art was commissioned by the same individual that is known for approving Nicolaus Copernicus' model of the universe. This piece is located in the same place that the person that takes over the individual's job is selected in modern days. It was created by a well known renaissance artist known for expressing art with emotional depth and intellectual depth. It depicts a central being surrounded by many individuals waiting for something. What is this piece of art?

OQL: This piece of art, painted by one of the most well known renaissance figures, depicts a central figure deciding the fate of each human on Earth. What is this piece of art?

Answer: The Last Judgment

Explaining the Answer

The individual that is known for approving Nicolaus Copernicus' model of the universe, "heliocentrism", could be a couple of figures but in this case it is Pope Clement VII [B6]. The location where new popes are selected is the Sistine Chapel. The fresco of The Last Judgment depicts the second coming of Christ as a central figure with the dead rising awaiting their judgment [B15].

Why is it Interesting?

The Last Judgment is one of the most famous frescoes in the world. Although the piece of art contains a lot of interesting imagery and provides a look at Michaelangelo's world view, that is barely used in the question. Instead, the question also relies partly on the facts and history behind the fresco. This would be interesting to individuals that lie towards history rather than art.

Why is it Pyramidal?

The hardest clues are at the front of the question. The guesser would have to know multiple facts including Copernicus' model of the universe, the people who approved of it when geocentrism was still the prevalent way of thinking about the universe. Towards the end, the question gives a direct clue to the piece of art, vaguely describing what is contained within it.

Why is it Hard (for computers)?

The computer would need to piece together multiple pieces of information across the question in order to get a hint about it [A5]. Since there are multiple people in high positions that approve of Copernicus' heliocentric ideas, the computer would need more information. Other parts of the question are also vague enough that multiple people could fit in the category, for example, "well known renaissance artist".

QA System Answers

Chat-GPT: The School of Athens
Bing: The School of Athens

Q3 (Mural)

Pyramidal: This artwork began as a collection of murals during the early 2000's. The collection of murals was painted across a capital which has a nursery rhyme named after its architecture. The work of art itself consists of a bit of red in the iconic symbol of love, which is contrasted by a mixture of black, gray, and white. Destruction of this artwork took place following its sale in the late 2010's. Following this event, which was directly planned by its artist, the artwork was renamed from what?

OQL: This red and monochrome artwork started as a set of murals in London during the early 2000's. Following the destruction and sale of the artwork in the late 2010's, the name was changed from what?

Answer: Girl with Balloon

Explaining the Answer

"Girl with Balloon" started as a collection of stencil murals around London during the early 2000's. Banksy created these artworks in London, England starting in 2002. The nursery rhyme about a capital and its architecture in question is "London Bridge is Falling Down" [B14]. This shows the location of the artwork. Furthermore, "Girl with Balloon" visually is a red heart, which is symbolic of love, and a monochrome girl. In 2018, the artwork was sold for £1,042,000 and remotely shredded by Banksy [B7]. The artwork was then changed to "Love is in the Bin" from "Girl with Balloon," which is the answer.

Why is it Interesting?

This question is interesting because this was a widely covered event in regards to Banksy intentionally destroying his own artwork after its sale. His "Girl with Balloon" series started back in 2002, and this sale of £1,042,000 was his highest priced work of art to date [B7]. The destruction of the artwork had been planned, and shocked everybody taking part in the auction for the artwork, making headlines. This new shredded artwork, "Love is in the Bin" is worth even more than its original, "Girl with Balloon," which also shows its importance [B13].

Why is it Pyramidal?

The question is pyramidal since the question goes from broadly explaining the origin of the artwork, to giving hints about the murals' locations in London. Furthermore, the question gets easier with its description of a red symbol of love surrounded by monochrome. Lastly, the final hints of the sale and intentional destruction of the artwork in the late 2010's should allow for pinpointing of this artwork to be "Girl with Balloon."

Why is it Hard (for computers)?

The question is hard for computers since you would need to comprehend nursery rhymes with capital names, which could be pinpointed as "London Bridge is Falling Down" by humans [A7]. Furthermore, the computer gets stuck trying to parse and answer this question about the nursery rhyme rather than the final question. The question also used descriptions of the artwork and common sense behind the symbol of love to make this question easier for humans, and harder for computers [A1]. Lastly, AI such as Chat-GPT can guess that the artist is Banksy from the destruction and sale of this artwork, but guesses the wrong artwork since computers get stuck on the artist name due to the misdirection used at the end to ask about the original artwork's name.

QA System Answers

> **Chat-GPT**: London Calling (Pyramidal) / The Banksy Murals (OQL)
> **Bing**: Love is in the Bin (Pyramidal) / "Girl with Balloon" with extra hints given (OQL)

Q4 (Spanish Painting)

Pyramidal: There was once a famous individual who had relations with Luis Buñuel until after the Spanish Civil War when they denounced Socialism. This person also was a prevalent artist in the 20th century and made many works describing his mental state and desires, especially sexual ones. What was the piece this individual worked on half a decade after the the Civil Rights Movement in the United State of America in particular that was controversial because of the rumors associated with it as well as the visual being somewhat grotesque to the public as it depicted the individual's conflicting sexual desires and distastes of a famous individual from World War 2?

OQL: Following half a decade after the Civil Right movement in the United States of America, this piece depicted a famous World War 2 individual in a sexual manner and was made by an individual who made controversial pieces regarding his sexual desires and disgusts who also used to have relations with Luis Bunuel until after the Spanish Civil War. What was the piece?

Answer: Hitler Masturbating

Explaining the Answer

Salvador Dali was famous in that he was notable for painting works that describe his mental state and his sexual desires and disgusts. He also is noted to have publicly broken relations with Luis Bunel after the Spanish Civil war while publicly being a conservative [B8]. The Civil Right movement in America ended 1968 and half a decade after that is 1973. The famous World War 2 individual depicted in the painting is Hitler and the painting describes his fantasy of Hitler being a woman and them having intercourse [B9] [B10].

Why is it Interesting?

This question is interesting because the time period of the painting and its subject do not coincide and the painting itself is very controversial.

Why is it Pyramidal?

The question is pyramidal because the questions went from broadly explaining the painter of the piece as a former supporter of a famous filmmaker to slowly getting into a time period and in fact a year and also describing what the individual is particularly and specifically famous for.

Why is it Hard (for computers)?

It could be difficult because of the involvement of timer periods not coinciding with the origins of the painters and the event of World War 2 mentioned probably triggered Hilter and this was not a well-known painting. This is known as multi-hop [A3].

QA System Answers

Chat-GPT: The Enigma of William Tell / Throbbing Gristle

Bing: The Enigma of William Tell

Q5 (Controversial American Artwork)

Pyramidal: The beginning of the 21st century was a continuation of modern criticisms of conservatism in art. At the beginning of the 21st century, there was an artwork which was an imitation of a famous Italian person's works from centuries before this which caused many people in the conservative and religious Christian community to be very offended and eventually caused a politician to create standards of decency for publicly shown art. This individual is regarded by many to be a feminist and progressive and often controversial. Now, copies of this piece are hung in other places around the world. Who is in the center of the piece?

OQL: This early 21st century American piece, which was made as an imitation of a similar piece by a famous Italian person from 6 centuries prior, by a renowned feminist caused the conservative Christian community to be offended and for a politician to push for standards of decency because of the naked person at the center which was who?

Answer: Renée Cox

Explaining the Answer

The painting was made in 2001 which was in the beginning of the 21st century, and it was an imitation of the Last Supper by Leonardo da Vinci [B11]. Many imitations were made over the centuries and one of them was *Yo Mama's Last Supper* made by Renée Cox. Pictured in the center was her own self-portrait of her naked with all the others around her. This work was such a controversy that the Mayor of New York City at the time, Rudy Giuliani, pushed to create standards of decency for art shown publicly. Renee continues to be a known feminist with all of her other works, many of which are known to stir controversy. This specific work is shown in many galleries around the world [B12].

Why is it Interesting?

It is interesting because this was the start of controversial art in the 21st century and it garnered even political attention. This piece is also interesting because the artist put herself as the center of her own work.

Why is it Pyramidal?

It began as an overview of the 21st century and in the subject of art, then it was more specific when it was mentioned that the piece was an imitation of a piece from centuries before that was Italian. There is a specific set of works from famous Italian artists. Then, it got more specific when it was that it offended the conservative Christian community and so much so that a politician pushed decency standards because that was a specific event. There are only a few times that happened and only 1 was with a renowned feminist.

Why is it Hard (for computers)?

This was difficult for computers because although the question's idea was correct, the computer failed to answer the actual question which was the figure in the middle of the piece. Instead, it answered about the piece itself and was not able to identify the figure in the middle as the artist herself even though it is a well-known fact. This is known as multi-hop because the focus of the question was switched [A3]

QA System Answers

Chat-GPT: A black female figure | Judy Chicago

Bing: The Man in the Red Turban | Vulva-based center plate with a butterfly at the center

Literature

Q1 (Japanese Literature)

Pyramidal: In one of this author's fictional works, the main protagonist tries to dismantle a Mafia organization, teaming up with other members of the gang to do so. The main character of this work is associated with the name of a musical album created by a famous American musician who also created the song "Purple Rain", and is this author's favorite musical artist. In one well known scene, some of the characters perform a dance while torturing a thug who tried to ambush them on a boat. Like many of the other main antagonists of this author's works, the main antagonist is associated with the movement of time. Name the author who created these characters, and is well known for referencing musical artists/bands in his works.

OQL: Name this author who associates the majority of the characters in his works with names of musical artists/bands such as King Crimson and Queen, and whose main antagonists are often related to the movement of time.

Answer: Hirohiko Araki

Explaining the Answer

The piece of work by Araki that is described is Jojo's Bizarre Adventure (JJBA), particularly part 5. The story is about someone trying to dismantle a Mafia organization called Passione from within [C1]. The main character's ability is called "Golden Experience" which is a reference to Prince's last album. Prince made the song "Purple Rain" and is also Araki's favorite musician [C3]. There is a scene called torture dance in the story where characters dance while torutring someone who tried to ambush them [C1]. Many of the primary antagonists in Araki's work have the ability to manipulate time, e.g. Dio can stop time [C2]. King Crimson and Queen, both rock bands, are associated with the names of primary villains in Araki's works. Most of the major characters have some sort of musical reference too.

Why is it Interesting?

The series by Araki, JJBA, has sold over 120 million copies by December 2021, making it one of the most best-selling manga series in history [C4]. It is so popular that parts of it has its own animated adaptation on Netflix, and has even collaborated with famous fashion brands like Gucci and Balenciaga [C5].

Why is it Pyramidal?

The first sentence gives a brief summary of the work, making it hard to guess unless you have recently read Araki's works. The second story hints about a main protagonist written by Araki using a musical reference that people may not know about. The third sentence describes a well-known unforgettable scene that happens in one part of the story. The fourth sentence gives info on multiple works by him instead of a single one. The fifth sentence is the easiest because basically all of the major characters in Araki's works are musical references.

Why is it Hard (for computers)?

Although his works are fairly popular in the U.S, Araki is a Japanese author, so systems are still a bit biased towards English speaking countries. This can be seen as the pyramidal answers given are people who are American [A2]. The question is also steered toward a more "English" answer as some of the clues given are referenced to American/British rock bands. The question also uses multi-hop as the system must know who composed "Purple Rain" in order to get information about the author [A3].

QA System Answers

Chat-GPT: Quentin Tarantino (pyramidal), Haruki Murakami (OQL)
Bing: Jojo Moyes (pyramidal), Haruki Murakami (OQL)

Q2 (Children's Book)

Pyramidal: This mid 1900's book primarily has a target audience of children. The author has written many other children's books. In one of his works, a creature who "speaks for the trees," and attempts to protect the forest from those who wish to harvest the trees. The piece of literature in question mentions a type of aquatic creature, which takes up half of the words of its title. What is the name of the children's book whose title relates to numbers and colors of the rainbow?

OQL: This book was created by a known author who creates children's books, one of which has a creature who "speaks for the trees." Name the book by the same author whose title consists of a type of aquatic creature, two colors of the rainbow, and numbers.

Answer: One Fish, Two Fish, Red Fish, Blue Fish

Explaining the Answer

The first clue explains that this is a mid 1900's children's book, and "One Fish, Two Fish, Red Fish, Blue Fish" was written in 1960 for children. The next line references "The Lorax" as one of the author's works, which says that the author of the book in question is Dr. Seuss [C6]. "One Fish, Two Fish, Red Fish, Blue Fish" was indeed written by Dr. Seuss, and its name consists of fifty percent "Fish," which is an aquatic creature [C7]. The final statement with the question gives the remainder of the title by describing "One" and "Two" as numbers, while "Red" and "Blue" as colors of the rainbow [C8].

Why is it Interesting?

This is interesting because many of Dr. Seuss' books were a part of many people's childhoods. Dr. Seuss' popularity still remains to this day, as many elementary schools have his books on shelves for children to read. The question in particular is also interesting in that it asks about a book by Dr. Seuss which is not one of the most popular ones such as "The Lorax" and "Green Eggs and Ham" [C6]

Why is it Pyramidal?

The question is Pyramidal by starting with the broad category of children's books. The next hint gives that the book shares the same author as that of "The Lorax." This of course is Dr. Seuss. Furthermore, hints are then given about the book consisting of aquatic creatures, and that its name is fifty percent made up of the creature. This,

paired with the idea that the title also includes numbers and colors of the rainbow, should be enough to know that the book in question is "One Fish, Two Fish, Red Fish, Blue Fish" by Dr. Seuss.

Why is it Hard (for computers)?

This question is hard for computers due to the need to draw a common link between the author of the book in question, and the author of "The Lorax" [A6]. After describing "The Lorax" as one of the author's works, Chat-GPT confidently guesses that the book in question is "The Lorax" [A5]. However, this is not correct as the subsequent hints mention an aquatic creature taking up half of its title, as well as the inclusion of colors and numbers in the title. Chat-GPT can sometimes guess that the "second book in question" is "One Fish, Two Fish, Red Fish, Blue Fish." However, this guess is not the initial guess, as the guess clearly states the book is "The Lorax."

QA System Answers

> **Chat-GPT**: The Lorax (Pyramidal / OQL – Sometimes correct)
> **Bing**: The Lorax (Pyramidal / OQL)

Q3 (Firebombing of Kobe)

Pyramidal: This historical event occurred towards the end of one of the most deadly wars in history. A certain semi-autobiographical short story described the author's efforts to survive before, during, and after the deadly event alongside his family. The story is about two siblings who are orphaned after western military forces burned their hometown in an East Asian country to the ground in a part of a wider campaign to weaken the enemy. Eventually, The story was eventually adapted into an anime movie by the studio that created the large fluffy creature with a signature grin and leaf on top of its head, and the spirit who is known for having a blank white mask covering its face. What historical event took place in the short story and the movie?

OQL: This historical event was the cause of the suffering that the main characters of a semi-autobiographical short story, which tells the journey two siblings went through after their home town in Japan was burnt through the ground, went through.

Answer: Firebombing of Kobe

Explaining the Answer

The semi-autobiographical short story that the question is asking about is titled *Grave of the Fireflies* where the author, Akiyuki Nosaka, records his experiences before, during, and after the firebombing of Kobe, and the destruction of his family [C12]. The Bombing of Kobe was a part of a wider operation carried out by the United States Air Force which burned down many cities in Japan [C13]. This novel was eventually adapted by Studio Ghibli and was released as an animated film in 1988. The fluffy creature with a signature grin and leaf is Totoro and the spirit known for having a blank white mask covering its face is Kaonashi or No Face.

Why is it Interesting?

The Grave of the Fireflies is an emotional story in both its book and film forms. Akiyuki Nosaka has won awards for this novel and the subsequent film has been deemed one of the greatest war films of all time [C14]. The firebombings of Japan in World War II are also one of the lesser known events of the war. Although the atomic bombs made headlines in the past, not many people knew that the firebombs killed more people and did more damage.

Why is it Pyramidal?

The first sentence tells that the answer is a historical event and gives some context to what it could be. The next part of the question delves more into the category of the question, literature. A basic summary of the novel is given along with even more context about the event. The next portion of the question involves a studio that many people know and gives hints about what that studio could be. By connecting all of this information together, many people should be able to answer it.

Why is it Hard (for computers)?

The computer needs to connect a link between the novel and the event that occurred within its story. Chat GPT probably used the information that the main characters' hometown was destroyed and had the atomic bombing as a result since it is much more well known and relevant than the firebombings. However, that event is not the one that occurred within the novel.

QA System Answers

Chat-GPT: atomic bombing of hiroshima and nagasaki

Bing: Grave of the Fireflies

Q4 (Adult books with Children's authors)

Pyramidal: The target audience of this late 20th century author is to elementary school children. One of this author's works deals with a farm animal and an arthropod's unlikely friendship as they grow up together and improve each other's lives. The author of this has written many other books with the same target audience, however, the work in question deals with adult topics and was written around the time of the beginning of The Great Depression. It deals with theories having to do with those adult topics and it was more of a collection of essays. Who was the co-author of this work?

OQL: Who was the co-author of a book which was a collection of essays of theories dealing with adult topics written about a month into The Great Depression, whose co-author decades later on wrote a children's book about a farm animal and an arthropod's unlikely friendship?

Answer: James Thurber

Explaining the Answer

James Thurber and E.B. White wrote a collection of essays titled Is Sex Necessary? Or, Why You Feel the Way You Feel, which was a work directed towards adults and it dealt with theories of sex. This was written by them in 1929 which was towards the beginning of the Great Depression. E.B. White also wrote a book in the late 20th century called Charlotte's Web which was about a friendship between a pig and a spider on a farm.

Why is it Interesting?

It is interesting because E.B. White is known for only writing children's books such as Charlotte's Web and The Trumpet of the Swan. It is inconceivable to some that an author can write books with different age groups because they are known for one.

Why is it Pyramidal?

It's Pyramidal because it first deals with a general group which was late 20th century children's book writers. Then it gets more specific when describing the book which is Charlotte's Web which was the only book like that summary of its time. Then, the question describes the same author's other works towards the beginning of The Great Depression and that should then be a subset of his works. The only one that is a collection of theories having to do with adult

topics that is also written by a co-authored is the book Is Sex Necessary? Or, Why You Feel the Way You Feel which was co-authored by James Thurber.

Why is it Hard (for computers)?

It might be hard for computers because maybe the meaning of "adult topics" is a bit vague. This could be classified as the monoculture adversarial technique [A2]. Even though the model is trained for english-speaking and European cultures, it also has to adapt to societal values. In this case, the computer might not know or have a clear definition of "adult topics" or a derivation that this term means topics not suitable for children.

QA System Answers

    Chat-GPT: One Man's Meat was a solo work (Pyramidal) | E.B. White (OQL)
    Bing: One Man's Meat was a solo work (Pyramidal) | E.B. White (OQL)

Q5 (Robert Frost)

Pyramidal: This poet is regarded as one of the greatest poets from the twentieth century. This person was named after the son in law of George Washington's wife's grandson. In his later years, this poet wrote poems with a more philosophical and reflective viewpoint. The most famous poem that this person wrote is often misconstrued in its meaning and this misunderstanding was talked about in a tv show that is based on an author's experience in prison. Other works this poet has written include "Stopping the Woods on a Snowy Evening" and "Fire and Ice". Who is this poet?

OQL: This poet's most famous work was mentioned in a television show that tells a story about the people in a women's prison.

Answer: Robert Frost

Explaining the Answer

George Washington's wife, Martha Washington had children with Daniel Parke Custis before marrying George Washington, including John Parke Custis who was the father of confederate general Robert E. Lee's father in law. Robert E. Lee was the namesake of Robert Frost [C9]. It is noted that later in his life, Robert Frost began to write poems focusing more on his philosophy and introspection. Frost's most famous poem is *The Road Not Taken*. Although many people believe it to be a poem that tells people to choose their own fact, the real reason behind its creation is as a joke between Frost and his friend [C10]. The poem was also mentioned in the show *Orange is the New Black*.

Why is it Interesting?

Robert Frost is one of the most well known poets in modern days. His poems gained a lot of attention because of the way they depicted life in rural New England and how they portrayed everyday people [C11].

Why is it Pyramidal?

The first sentence lets the guesser know that the answer is of a famous poet. After that there are a couple of hints that give more information about who the person could be but in a roundabout way. After, information about the poet's works are revealed to the guesser, making it easier for them to guess. Lastly, a very easy hint is given as the question directly gives information about the poet.

Why is it Hard (for computers)?

The question attempts to confuse the computer by utilizing multi-hop when asking about Robert Frost's most famous poem. Here, the computer needs to connect the description of the show *Orange is the New Black* to its title, and also connect the poem to an event that happened within the show. Humans may know this information but it may be harder for humans to connect it [A3]. The question also attempts to trip up the computer by mixing up the familial relationships of Robert E. Lee, therefore attempting to trick it through common sense [A1].

QA System Answers

Chat-GPT: T.S. Eliot

Bing: Robert Frost

Geography

Q1 (River)

Pyramidal: The first species of dolphin which is believed to be driven to extinction because of human intervention, like the Steller's sea cow, is home to this major body of water. If you extend it with itself, this body of water is just over four times the length of the river that borders Texas and Mexico. This body of water contains a power plant that is not smaller than the Baihetan Dam. Name this body of water that is longer than the Yellow River.

OQL: Name this body of water, which when you extend it with itself, is over four times longer than the Rio Grande, and is also home to the power plant that is not smaller than the Itaipu Dam (third largest in the world).

Answer: Yangtze River

Explaining the Answer

The first species of dolphin driven to extinction by humans is the Yangtze River Dolphin or Baiji, which lives in the Yangtze River [D1]. The Steller's sea cow is the first known aquatic animal to go extinct by humans [D2]. The Rio Grande borders Texas and Mexico and is around 3000 km [D4]. The Yangtze is around 6300 km, so if you extend it by itself, it is over 4x larger than the Rio Grande [D3]. The Baihetan Dam is the second largest power plant in the world, so the plant that is not smaller than it would be the largest, Three Gorges Dam, located on the Yangtze [D5]. The Yangtze is the longest river in East Asia, so it is longer than the Yellow River (second longest in East Asia).

Why is it Interesting?

The Yangtze River is important not only because it is the largest river in East Asia, but also supplying more than 40% of China's GDP [D6] as it supplies food, water, and transportation for people. For environmentalists, it is also important because the Baiji went extinct there [D1].

Why is it Pyramidal?

For the first sentence, one must know that the Baiji is the first species of dolphin driven to extinction by humans, which is not the most well known fact about the Yangtze. The second sentence is about the length of the Yangtze river, and another popular one, the Rio Grande, which is not something everyone knows about. The third is easier as it gives info on how the largest power is located there. The last sentence is the easiest, because both the Yellow River and Yangtze are the most notable and longest rivers in East Asia.

Why is it Hard (for computers)?

Several uses of multi-hop, which may be difficult for computers [A5], are used in the questions such as needing to know the first species of dolphin driven to extinction by humans, and the river that borders Texas and Mexico. The Steller's sea cow has nothing to do with the question and is just there to throw off systems that rely on named entities [A6]. There is also some common sense needed, which systems may struggle with [A1], as the question does not specifically say that the answer is a river, but you don't really compare lakes and seas by their lengths as some of answers given were not even rivers. Logical reasoning is also used, in which QA systems struggle with [A7], such as the fact that if you extend a river with itself, it becomes two times longer. So if something's length is doubled and is 4x longer than another thing, is just another way of saying it is 2x times longer than that thing. Math is also required in this, when comparing river lengths, where systems commonly mess up with [A4].

QA System Answers

Chat-GPT: Black Sea (pyramidal), Paraná River (OQ)
Bing: Black Sea (pyramidal), NO ANSWER (OQL)

Q2 (Canyon)

Pyramidal: This natural formation is hypothesized to be formed by the same body that shares a name with the place that contains the Broncos football team. It was first settled by the people whose name means "enemy ancestors" in Navajo. This place is known for having a large number of plant and animal species thanks to the varying ecological systems that exist from varying elevations. One of the most well known attractions for casual visitors in this place is an area where you are able to see through where you are able to walk around in the shape of the first letter of an object that blocks the rain and looks down over 4000 feet. What is this natural formation?

OQL: This natural formation is hypothesized to be formed by the same body that shares a name with the place that contains the Broncos football team. and is one of the most famous natural landmarks in the world with millions of visitors every year. What is this formation?

Answer: The Grand Canyon

Explaining the Answer

The Broncos belong to Denver, Colorado, which shares a name with the Colorado River. This river has formed several landmarks including the Grand Canyon, Arches National Park, and more. The Ancestral Puebloan first settled the Four Corners region of the United States and were the first people known to live in the area of the Grand Canyon. The Grand Canyon is home to 5 different life zones: Lower Sonoran, Upper Sonoran, Transition, Canadian, and Hudsonian [D15]. These zones each exist at different altitudes and are home to a variety of plant and animal species. The Grand Canyon is home to the Grand Canyon Skywalk which is a horseshoe-shaped glass bridge that allows visitors to look down over 4000 feet beneath them [D14]. It is one of the most famous natural landmarks in the world.

Why is it Interesting?

The Grand Canyon is a well known landmark and is subject to a large number of research topics. It is also well known to many more casual individuals who visit the area as well. Since it is so well known and so oftenly visited, many people could be interested in it. It can also be interesting to people who are focused on history as there have been many groups of Native Americans who have lived in the area of the Grand Canyon.

Why is it Pyramidal?

The first couple of clues are very vague. They do give some information about the answer but nothing will make it obvious. The last couple of answers give the most information about the Grand Canyon that complements well with the previous hints provided. Knowing that it is one of the world's premier natural attractions could narrow down possible answers to only a couple.

Why is it Hard (for computers)?

The question contains a multi-hop hint where the computer would need to know the answer to the state that the Broncos belong to and connect that to the Colorado River. The computer would also need to connect all of that to the natural formations that the Colorado River created to narrow down the list of possible answers.

QA System Answers

Chat-GPT: Mesa Verde National Park

Bing: Grand Canyon National Park

Q3 (European Country)

Pyramidal: This region is a nation that is in the European Union. The nation is bordered by a nation which shares its borders with the country currently involved in warfare with Russia. There is a commonly known figure who grew up and was raised in this region. This figure deterred from the pursuit of creativity in art. Various films and television shows, such as "The Man in the High Castle," have been created and revolve around this figure's actions. What is the name of the nation?

OQL: This nation in the European Union borders a nation with borders to Ukraine. A commonly known figure born and raised in the nation deterred from the pursuit of creativity in art, and was deeply involved in the Second World War as a leader. What is the name of the nation?

Answer: Austria

Explaining the Answer

Austria is the answer since the country is a part of the European Union. Furthermore, Austria borders Slovakia, a nation which shares borders with Ukraine [D9]. Ukraine is the current country at war with Russia as well [D8]. Furthermore, the rest of the hints are in regards to Adolf Hitler, who is a well known figure born and raised in Austria. In regards to the hint about art, Adolf Hitler, prior to assuming power and leading Nazi Germany, was an artist [D7]. Thus, the country that borders a bordering nation of Ukraine, and the nation Hitler was born in, is Austria.

Why is it Interesting?

This is interesting because Adolf Hitler, as a figure, is known for his actions during the Second World War and his involvement in leading Nazi Germany. Thus, most of the information regarding Adolf Hitler is about his rise to power in Germany, which may lead many to believe that his birthplace is in Germany, rather than Austria [D7]. Furthermore, this question was interesting since I initially was going to write about Germany, until Chat-GPT responded to the question with "Hitler was born in Germany." This is most definitely not correct, which sparked me to change my question to revolve around Austria rather than Germany.

Why is it Pyramidal?

This question is pyramidal since the initial hint about the nation being in the European Union limits the list of possibilities to countries. Furthermore, the geographic hints that uses, rather than familial relations, geographic relations, further limits the possibilities if the guesser knows that Russia is currently at war with Ukraine. Lastly, the hints about the birthplace of the well known figure, Adolf Hitler, should be enough to limit the possibilities to only Austria. Although Hitler rose to power in Germany, which fits the other criteria, he was not born there.

Why is it Hard (for computers)?

This is hard for computers, first for the connection needed to know that Ukraine is at war with Russia, and which countries are bordered by Ukraine's neighboring countries [A3]. This logical jump is hard enough, but mentions of Hitler's background in art and various films related to his reign of Nazi Germany then further trick computers such as Chat-GPT into believing Hitler is born and raised in Germany [A7]. This however, is clearly not true, as he was raised and born in Austria, a country that is in fact, a part of the union and borders a bordering nation to Ukraine.

QA System Answers

Chat-GPT: Germany (Pyramidal / OQL)
Bing: Germany (Pyramidal - Sometimes correct / OQL)

Q4 (Trench)

Pyramidal: This is the name of a specific landform that was created by geophysical processes. The mentioned landform resulted from the collision of lithospheric plates, a process known as subduction. This landform is located in an ocean that lies East of Asia and Australia, and West of the Americas. The type of this specific landform is the deepest kind of geological landform. The height of the tallest landform is less than the depth of this landform, which is named what?

OQL: This specific landform was created through subduction, and is the deepest type of landform. What is the name of this specific landform which lies in an ocean, and has a depth greater than the height of the tallest known landform?

Answer: Mariana Trench

Explaining the Answer

The question asks for the name of a specific landform, which is a geographical feature. The Mariana Trench is a landform created from subduction, along with mountains and other landforms [D11]. The Mariana Trench is located in the Pacific Ocean, which is East of Asia and Australia, and West of the Americas [D12]. Furthermore, the Mariana Trench falls under the type of landform, trench, which is the deepest kind of landform. Lastly, the Mariana Trench is deeper than Mount Everest, the tallest known landform, thus giving the result of the Mariana Trench; which, is the name of the specific trench in question.

Why is it Interesting?

This is interesting because the Mariana Trench is the deepest known place on Earth. The trench itself has a depth deeper than Mount Everest, and is home to many unknown creatures and species of animals still [D10]. The trench has been explored somewhat, but has not been fully explored due to the depth, water pressure and heat from the depth. Thus, the unknown and undiscovered aspects of the Mariana Trench is why the landform is interesting. Its formation was also created from subduction, which is the collision of tectonic plates over many centuries; which is why the Mariana Trench's depth is so deep [D11].

Why is it Pyramidal?

The question is pyramidal since the first hint is broad, as there are many thousands of named landforms, whether it be mountains, rivers, etc. The next hint narrows the possible types of landforms to those created by subduction, or the collision of lithospheric (also known as tectonic) plates [D11]. The remaining possible types of landforms are mountains, islands, and trenches among others. Furthermore, the location of this specific landform in question hints towards the type of landform being related to the Pacific Ocean [D13]. The following hint further details that this type of the specific landform is the deepest kind of landform, which is a trench. Lastly, the deepest known trench in the Pacific Ocean which is deeper than Mount Everest, the tallest landform, is the Mariana Trench.

Why is it Hard (for computers)?

The question is hard due to the need to define "geophysical," as the word specifically refers to the process that creates trenches. On the other hand, geological refers to the type of formation that results from the process. A similar trick is used for mentioning the collision of "lithospheric plates" instead of tectonic plates, the more commonly used term [D12]. This alternate definition tricks computers into thinking the landform is created from another process. The description of the location, being East of Asia and West of the Americas, requires common sense to know the landform is in the Pacific Ocean [A1]. Lastly, the final hint about the depth of the Mariana Trench requires knowing Mount Everest is the tallest landform, which then allows guessers to know the deepest landform is the Mariana Trench; which, is deeper than Mount Everest [A3].

QA System Answers
> **Chat-GPT**: Trench (Pyramidal / OQL)
> **Bing**: Trench (Pyramidal / OQL)

Q5 (Town)

Pyramidal: This town lies within a mountain range that acts as a barrier between the interior of the United States and the direction that is opposite of where the sun sets and is located in a state where the official sport is one where two people ride towards each other on an animal that cowboys ride, and try to knock each other to the ground by striking each other. Its name was derived from how two surveyors employed by the owner of a land deed that eventually became the town, surveyed the same area by another word for coincidence or chance. This city shares its name with what people associate with unexpected events. What is this town?

OQL: This town was named after a series of unexpected events that eventually led the owner of the land to name it in a way that commemorates how it was found. What is this town?

Answer: Accident, Maryland/ Accident

Explaining the Answer

The town of Accident, Maryland lies along the Appalachian Mountains which acts as a natural barrier between the interior of the United States and its east coast [D16]. The sport where two people ride towards each other and knock each other to the ground is the sport of jousting and it is the state sport of Maryland [D17]. When the land around the town was first surveyed in 1751, the two corps of engineers that were sent out accidentally surveyed the same area. As a result, the owner, George Deakins, decided to patent the land as "Accident Tract", which is the origin for its name [D18].

Why is it Interesting?

The name of the town, "Accident", can be considered an unusual place name [D19]. Although it is a small town and rather far from larger cities, it has some interesting history behind its creation and development.

Why is it Pyramidal?

The first hint gives that the answer to the question is a town and gives clues about its location within the United States. The difficulty of these hints is rather high as it also uses a couple of methods meant to fool the computer. The next hint gives context to the history of the town itself. Although not everyone may know it, people who know about the history of the town may be able to guess from this. The last hint gives information about the name of the town itself.

Why is it Hard (for computers)?

The question incorporates some multi-hop components in the first sentence. The computer needs to connect the context of the mountain range and barrier to the Appalachian Mountains, the riding and striking to jousting, and use that information to get the location of the town [A3]. The question also requires the computer to interpret the hints. For example apart from jousting, there are other sports done on horseback including horse soccer.

QA System Answers

Chat-GPT: Dodge City

Bing: Odds, Nebraska

History

Q1 (Warfare)

Pyramidal: During this war, a mass murder occurred, but no memorial was built until decades later, in a city which also held the signing of a treaty that ended the war before World War II. A bombing, planted by a person of the opposite sex of Winston Churchill at a place which sells the drink that keeps you awake in the morning, also took place during this war. One major party in this war was founded in Egypt, and declared this war the same year it was established. This war was ended by the signing of a treaty which shares a similar name to the Evian Conference initiated by President Franklin D. Roosevelt. Name this conflict in which France lost the colonial possession to a country near Egypt.

OQL: Name this conflict involving a major Ally country of World War I, and had a bombing at a cafe planned by a person of the opposite sex of Winston Churchill, but was ended with the signing of a treaty which shares a similar name to the Evian Conference initiated by President Franklin D. Roosevelt.

Answer: Algerian War of Independence

Explaining the Answer

During the Algerian War, a massacre occurred in Paris (1961) but wasn't recognized until 40 years later where they then built a memorial for the people that died [E1]. The war before WWII is WWI, and the treaty that ended that war, was the Treaty of Versailles, which was in Paris. Winston Churchill is a man, so the opposite sex would be a woman. The drink that keeps you awake in the morning is coffee, and a place that sells coffee is a café. Café wars took place in the Algerian war, and women also played an important role, doing bombings at various cafés. The most famous is the Milk Bar Café bombing by Zohra Drif [E2]. The treaty that ended the war is the Evian Accords, which shares the same name with the Evian Conference initiated by President Franklin D. Roosevelt. After the war, Algeria (which is near and allies with Egypt) won its independence from France [E3]. France was also a major ally in WWI, and Evian is also part of France.

Why is it Interesting?

The Algerian War is important, especially to Algerians, because it brought a 400 year Ottoman rule and inaugurated what was to be a French colony for over 130 years to an end [E4]. It is also interesting because women actually played an active role during the conflicts, as opposed to just helping out [E2].

Why is it Pyramidal?

The first sentence talks about a specific massacre that occurred during the war, which is important but not one of the defining features of the war, so people who know about the war may still not know about it. The second talks about a more famous bombing that occurred, you don't actually need to know the specific bombing but just the fact about women bombing cafés, which is pretty unique to the war. The third gives an easier clue as it states the treaty that ended the war, and the last sentence is the easiest because it states the major countries involved in the war.

Why is it Hard (for computers)?

The question uses a lot of common sense and basic questions to give hints about the war, which is easy for humans but difficult for some systems to grasp [A8] e.g. a place that sells the drink that keeps you awake in the morning (a café) and what war came before WWII (WWI of course). Easy facts about WWII are given to throw off the computer since many systems rely on named entities [A6], e.g. the sex of Winston Churchill (male of course), and treaties with a similar name to Evian Conference (Evian Accords). Roosevelt is also included to throw off systems. Multi-hop is also used in the first sentence as the computer must first know which treaty ended WWI, and the place that the treaty took place in. This can confuse systems to give the wrong answers [A5].

QA System Answers

> **Chat-GPT**: First Italo-Ethiopian War (pyramidal), Anglo-Irish War (OQL)
> **Bing**: First Indochina War (pyramidal), Anglo-Irish Treaty (OQL)

Q2 (Trials)

Pyramidal: Many forms of entertainment, media, and games reference this historical event. The location of the event is in the modern-day county which shares the same name as the American whaling ship which sank in 1820. This event took place in the North American state whose capital is used in the name of a type of donut containing cream. The event is portrayed in many games with the main focus of deception, one of which was a popular online game that begins with "Town of," followed by the location which this event took place in. What is the name of this event?

OQL: This event takes place in the county with the same name as the American whaling ship that sank in 1820. One of its towns shares its name with a game of deception that states with "Town of," followed by the town name, is inspired by what event?

Answer: [Salem witch trials](#)

Explaining the Answer

The Salem witch trials were a historical event of mass hysteria from colonial America. Salem is located in Essex county in Massachusetts [E8]. Essex is also the name of the American whaling ship sunk in 1820 by a sperm whale, the same event from the novel, Moby-Dick [E10]. Boston, Massachusetts is the state's capital, and has the Boston cream donut. Many games, such as "Mafia" and "Town of Salem" were influenced by the Salem witch trials, and are the games of deception in the question. Thus, the answer is the "Salem witch trials."

Why is it Interesting?

This is interesting since the historical event was one of America's most well known events of mass hysteria. Many people know about this event, and the event even influenced the creation of many games involving the deception of others. Furthermore, the Salem witch trials also influenced the improvement of the legal system in colonial America; many of the improvements can be seen in today's modern legal system during trials due to the unjust trials that occurred [E8]. The events that transpired also resulted in the creation of many memorials all around Salem to commemorate the innocent lives lost [E9].

Why is it Pyramidal?

The first hint reveals that the answer is a well-known historical event. The next hint reveals that the location is in Essex county from knowing that Essex was sunk in Moby-Dick during the year 1820 [E10]. Furthermore, the next hint gives the state where this specific Essex county is in, which is Massachusetts, through the mention of the Boston cream donut [E8]. The last clue given is that this event is portrayed in games of deception, and shares its location name with a well-known game starting with "Town of." This is the "Town of Salem," which should be enough to narrow down that the event is the Salem witch trials which is in Salem, a town in Essex county, Massachusetts.

Why is it Hard (for computers)?

This is hard for computers since the first hint produces the result "Essex," which is used as a common link to the name of the county which Salem now presides in. The common link causes Chat-GPT to assume the event is the sinking of "Essex," while "Essex" is simply the name of the county [A6]. Common link was also used for figuring out that the state in the question is also Massachusetts, with the capital of "Boston," which shares its name with a type of donut. Lastly, "Town of Salem" was popular, but not anymore, so combined with multihop, Chat-GPT assumes the game mentioned is potentially "Among Us" instead of "Town of Salem" [A3]

QA System Answers

> **Chat-GPT**: Essex (Pyramidal) / Salem witch trials (sometimes – OQL)
> **Bing**: Sinking of Essex (Pyramidal and sometimes OQL) / Mafia (OQL)

Q3 (Religion)

Pyramidal: During the pregnancy of this person's father's only wife, she was visited by the mother of the figure who turned the most abundant liquid on earth into the same liquid that he said was his blood. This person's birth was predicted by the same figure who explained the visions of the person who was saved from a den of lions. Similarly to how Goliath was defeated by David, not with the stones, this person suffered the same fate because of orders from the female offspring of a certain king. In order to survive, this person is known for relying on the stuff that bees make and the same thing associated with the plague of Egypt before the three days of darkness. Name this biblical figure that is associated with dipping the same son of the mother who visited in the first sentence in the Jordan river.

OQL: The figure who turned the most abundant liquid on earth into the same liquid that he said that it was his blood, was dipped into the same body of water Joshua crossed through by what famous biblical figure?

Answer: John the Baptist

Explaining the Answer

The most abundant liquid on earth is water. In the Last Supper, Jesus said the wine is his blood (Matthew 26:28) [E5]. He is also known for turning water to wine (John 2:1-11). His mother, Mary, visited John the Baptist's mother during her pregnancy (Luke 1:39-45). The Angel Grabiel foretold about John's birth (Luke 1:5-20), and was also the one who explained Daniel his visions (Daniel 8:1-14), who was the guy who was saved from a den of lions in the bible (Daniel 6). David defeated Giolath with a slingshot, but killed him by beheading him (1 Samuel 17). John suffered a similar fate as he was beheaded on the request of the daughter of King Herod (John 14:6-12). John the Baptist is known to survive on locusts and honey (Matthew 3:4), which is the stuff made from bees. In the Plagues of Egypt, the plague before the three days of darkness is the swarm of locusts (Exodus 10). John the Baptist is most known for baptizing Jesus at the Jordan river (Matthew 3:13-17). The Jordan River is the same river Joshua crossed through (Joshua 3).

Why is it Interesting?

John the Baptist is an important biblical figure whose stories are told a lot by people who believe in Christianity. He is also related to Jesus, who is basically the most famous person in history [E6]. Christianity is also the number one practiced religion in the world [E7].

Why is it Pyramidal?

The first question talks about the birth of the figure which is a story focused more on a different figure. The next clue is easier as there aren't many births in the bible that are foretold in the bible, besides Jesus. The third sentence is easier because it talks about the specific way the figure died which is pretty unique in the bible. The fourth sentence gives the second most known information about John the Baptist, locusts and honey. If you just search locusts and honey up, John will be the first result. The last clue is easiest because it talks about what the figure is most well known for (baptizing Jesus).

Why is it Hard (for computers)?

This question employs several uses of multi-hop making it difficult for the computer to get information. For example, the system needs to know who turned water into wine, and then the mother of that figure, and who was saved form the den of lions, to get info about the birth of John. The system also must know about the 8 plagues of Egypt, which day the three days of darkness took place, and the plague that occurred before that day, to get information about locusts. These are pretty popular information about the bible that humans can easily get, but systems may struggle with to connect everything [A3]. The question also describes words that are not really commonly used, which may be difficult for systems to grasp e.g. most abundant liquid on earth for water, and father's wife for mother. Also, instead of saying baptism (which is a big give away for computers), it is just described as dipping someone in water [A16]. There is also a bit of common-link involved as the system must figure out the similarities of the death between Goliath and John the Baptist, which may be hard for computers [A12].

QA System Answers

Chat-GPT: Jesus Christ (pyramidal, until last sentence + OQL)

Bing: Naaman (pyramidal), Jesus Christ (OQL)

Q4 (Emu War)

Pyramidal: This historical event took place in the country that the person who played P.T. Barnum in the film *The Greatest Showman* was born. In this "war", the members of the country's military were deployed in order to kill an enemy that ended up constantly avoiding gunfire seemingly "strategically". After the media began to cover it, international attention seemed to treat the war as a source of amusement rather than an actual war, as the target was a flightless species of modern day dinosaurs. What is this historical event?

OQL: This war was fought due to the destruction of farmland that was brought upon due to a species of modern day dinosaurs.

Answer: The Great Emu War/Emu War

Explaining the Answer

The Emu War took place in Australia which is where Hugh Jackman, who played P.T. Barnum in *The Greatest Showman* was born [E11]. During the so called "war", Australian soldiers utilized machine guns to try and quickly kill the emus that were standing around. However, an ornithologist said that the emus "evidently ordered guerilla tactics" and that they "split up into innumerable small units" that made it impossible to quickly eliminate them [E12]. When the media began to cover what was going on, people found it interesting and amusing as the soldiers had such a difficult time with the birds [E13].

Why is it Interesting?

The Emu War is a part of history that is more entertaining than it is serious. Although the emus did cause a lot of damage due to their migration patterns, the way that the Australian military decided to handle the situation was very over the top.

Why is it Pyramidal?

The first sentence of the question lets the guesser know that the answer is a historical event along with some context about where the event occurred. The next part of the question tells that the answer is some sort of war along with some information about what happened during the war. After, more information about the war is revealed that enables the guesser to narrow down the answer a lot because there are not many wars that were seen as a source of entertainment that the Emu War was. The last hint gives critical information that the war was against a species of bird, which basically tells the guesser which war it is talking about.

Why is it Hard (for computers)?

The question employs common sense in order to confuse the computer. Within the first two sentences, the computer is able to gain information and decide that the answer is a war. However, when people think of a war, they think of the more dangerous ones. In the case of chat GPT, the system chooses the American Civil War as its current guess. The information given, especially the wording in the second sentence suits the Emu War more.

QA System Answers

> **Chat-GPT**: Anglo-Zanzibar war (until last sentence)
> **Bing**: No Answer

Q5 (The Pig War)

Pyramidal: This war was between the country that spends the most on military and what is now the country that the artist who wrote "Hotline Bling" comes from. This war was a land dispute. The tension finally broke loose when a farm animal was shot. This began a war that ended in the country that spends the most on military winning and they ended up getting the land. What internal tension-turned-war was the winner of the war previously referenced more concerned with at the time?

OQL: There was a war, which was between the country that spends the most on military and what is now the country that the artist who wrote "Hotline Bling" is from, known for starting because of a land dispute and a shooting of an animal which ended in the victor getting the land. What was the internal tension-turned-war conflict that the victor of the formerly mentioned war was experiencing?

Answer: American Civil War

Explaining the Answer

The country that spends the most on military is the United States [E14]. The one who wrote the song "Hotline Bling" is Drake and he is from what is now Canada [E15]. Canada at the time was still a British colony but it still somewhat formed its own government. The land dispute between then that was triggered by someone's pig getting shot was called The Pig War of 1859 which was a dispute over the San Juan Islands which were ultimately awarded to the U.S.[E16] The internal tension-turned-war that the U.S. was dealing with at the time was the American Civil War [E17].

Why is it Interesting?

It's interesting because this was a very small dispute and it was a bloodless war. This was also one of the very few conflicts between the 2 countries. It's also interesting because not many people think about what also went on during the Civil War.

Why is it Pyramidal?

It is Pyramidal because there are many conflicts between the U.S. and another country and it narrowed it down to the U.S. and what is now Canada. Wars are usually about rights or land and this one was clarified to be a land dispute. It becomes even more apparent what war the questions is talking about when mentioning specifically a farm animal. The only one that has a farm animal getting shot is the Pig War and from there, it is easy to identify the victor and what other tension was brewing at the time.

Why is it Hard (for computers)?

It could be hard for computers because they might disregard smaller words. In the question, it is written "what is now" but perhaps the computer disregarded that and only thought of Canada as its own entity which messed with their time periods. It could also be hard because there are actually a few wars involving animals. This is the fault of common sense and maybe a computational mess up [A6] as well as the failure to reason its way through the answers and reason its way into thinking something more concrete rather than always finding out the most relevant topic or period [A7].

QA System Answers

Chat-GPT: The event is fictional (Pyramidal) | Quebec Sovereignty Movement (OQL)

Bing: Mexican-American War (Pyramidal) | Rebellions of 1837-1838 (OQL)

Science
Q1 (Kinematics)

Pyramidal: When taking the first, second, and third derivative of this term, these terms will share the same name of the gnomes that appear on a brand of cereal marketed by Kellogs. The clothoid curvature results in this term being constant. When taking the integral of this term, the value of this term becomes 9.8 for an object that falls through a vacuum. Name this term that is used to describe objects in motion.

OQL: Name the kinematics term which is constant in a clothoid curvature and if you take the integral, the value becomes 9.8 for an object that falls through a vacuum.

Answer: Jerk (physics)

Explaining the Answer

Jerk, or the third derivative of position, is a kinematic term used to describe objects in motion [F1]. The first, second, and third derivative of jerk is snap, crack, and pop [F5]. These names are inspired by the mascots of the Rice Krispies cereal by Kellogs. The Euler spiral (clothoid curve) has a smooth transition curve where it will not cause an abrupt change in acceleration, so jerk is constant [F3]. The integral of jerk is acceleration, and in a vacuum, acceleration is equal to gravitational acceleration (9.8 m/s^2) [F2].

Why is it Interesting?

Jerk is commonly used in physics and in real life such as controlling objects in motion accurately for precise control. For example, measuring or controlling jerk is essential for building roller coasters and road vehicles so people don't get injured when they use them [F4].

Why is it Pyramidal?

The first sentence is a very niche fact about the origin of the names of the names of the 4th, 5th and 6th derivatives of position. The second sentence is a physics concept that you would probably only know if you specialize in the topic and probably don't learn in high school. The last two sentences are the easiest as it states pretty obvious physics facts that are taught in high school. It is also pretty easy to guess jerk by the last sentence by process of elimination, since position and acceleration are obviously not the answer

Why is it Hard (for computers)?

The first sentence uses multi-hop in which the system needs to know which Kellogs cereal brand has gnomes as mascots with their corresponding names. Systems will struggle to answer based on this first question [A3]. Basic math concepts are needed such as needing to know derivatives and integrals. It is common to say that jerk is the derivative of acceleration, but not so common to say that acceleration is the integral of jerk. Systems may also struggle with that when they see the term integral [A9]. Finally, there is a question embedded in the overarching question: the value that becomes 9.8 for an object that falls through a vacuum, which is acceleration, but if you look at the whole question, it says that you have to take the integral first. Most systems answered the wrong answer of acceleration [A11].

QA System Answers

Chat-GPT, **Bing**: acceleration (pyramidal + OQL)

Q2 (Mathematics)

Pyramidal: This mathematical concept is used to help solve math problems. Its name contains a shape whose interior angles sum up to be a third of the sum of interior angles for a polygon containing five sides. The mentioned shape contains three vertices at max. The application of the concept is for determining the coefficients of an algebraic expression containing the sum or difference of two values or variables raised to a natural power. What is the mathematical concept such that, when applied to an algebraic expression to the power of three, the coefficients produced by this are one, three, three, and one?

OQL: A mathematical concept can be used to solve the coefficients of an expression regarding a sum or difference raised to a natural power. What is the concept which provides these coefficients and has a geometric shape in its name?

Answer: [Pascal's Triangle](#)

Explaining the Answer

Pascal's Triangle is a math related concept. Clearly triangle is a part of the concept's name, which is in fact, the shape of three vertices whose sum of interior angle is a third of the sum interior angles of the five sided polygon. The five sided polygon is a pentagon, whose sum of interior angles is 540 degrees, which hints at the shape being a triangle [A1]. Furthermore Pascal's Triangle is used to find the coefficients in binomial expansion, the expanding of algebraic expressions whose sum or difference of two values is raised to a power [F15]. The last question gives an example of the binomial expansion producing the coefficients one, three, three, and one from Pascal's Triangle.

Why is it Interesting?

This is interesting because this concept is essential in learning basic algebraic concepts such as the expansion of binomials, which is used all throughout math courses after learning algebra. Furthermore, its usage is more prevalent when applied to binomial expansions of powers higher than three, as its sequence of coefficients are easier to calculate using Pascal's Triangle [F15].

Why is it Pyramidal?

This question is Pyramidal due to the broad scope being that we ask about a mathematical concept. Furthermore, we hint through a tricky statement, that the name contains a shape, which is the triangle. Similarly, the description about binomial expansion gives hints that the concept is related to the algebraic concept. Lastly, the mention of the coefficients and even an example of binomial expansion, along with the previous hints, all lead to the concept being Pascal's Triangle [F15]. Binomial Theorem is invalid due to the lack of a shape in its name.

Why is it Hard (for computers)?

This question is hard for computers due to the math required to determine that the shape in the name is a triangle. The math behind this comes from knowing the sum of interior angles of a pentagon is 540, and a third of this is 180, which is equivalent to the sum of interior angles of a triangle [A4]. Furthermore there is misdirection used which talks about binomial expansion, which is where Pascal's Triangle is involved in terms of the coefficients. This misdirection makes Chat-GPT answer with "Binomial Theorem" and ignores the fact a shape is in the name [A3]

QA System Answers

> **Chat-GPT**: Binomial Theorem (Pyramidal / OQL)
> **Bing**: Binomial Theorem (mentions Pascal's Triangle but not as the answer – Pyramidal / OQL)

Q3 (Biology)

Pyramidal: This group of organisms was first discovered in the organ that connects the stomach to the colon in a very sick animal that is used to produce bacon. Antigenic analysis of the letter before P and the one after G antigens can be used to identify this group of organisms. This group of organisms can invade different cell types and are capable of producing ATP in areas with and without elements denoted by the letter O. There are three minus one known species of this group of organisms, and one of them is often found in the same species of the animal Kermit the frog would fall into. Name this group of rod-shaped organisms whose name includes characters of a certain fish, and is associated with the consumption of raw meat.

OQL: Name this group of organisms whose name includes characters of a certain fish, and causes someone to feel sick because of putting the stuff herbivores wouldn't eat into their stomachs without having the temperature of it being significantly raised.

Answer: Salmonella

Explaining the Answer

Salmonella was first discovered in the small intestines (connects stomach to the colon) in a pig with swine flu [F7]. While 95% of clinical isolates can be identified through antigen groups A-E, salmonella is identified through antigens O (letter before P) and H (letter after G) [F6]. Salmonella is a facultative anaerobic organism, so it can produce ATP with and without the presence of oxygen (O) [F8]. There are two (2 = 3 - 1) known species of Salmonella, Salmonella enterica and Salmonella bongori. Salmonella bongori is mostly found in reptiles (Kermit is a frog, and frogs are reptiles) [F6]. Salmonella are rod-shaped bacteria and cause people to get sick because of consuming raw (uncooked) meat (herbivores don't eat meat) [F7]. The word "salmon" (a type of fish) is in the word "Salmonella". While E. coli and Salmonella are both pretty similar, the question asks for a group of organisms. E. coli is the name of a bacteria, Salmonella is the name for a group of bacteria.

Why is it Interesting?

Salmonella is interesting because it is 1 of 4 key global causes of diarrhoeal diseases [F10]. In fact, the people who have read/ are reading this sentence may or may not have salmonella food poisoning. There are around 93.8 million cases globally each year, with 155,000 deaths [F9]. Don't eat raw foods. Just don't.

Why is it Pyramidal?

The first sentence talks about the history of its discovery that most people probably don't care about, although it does give a good hint that it appears in pigs and lives in the small intestines. The second sentence is related to how it is identified which only people who study in this specific area probably know about. The third gives hints about facultative anaerobic organisms, of which there aren't many that are of that type. The fourth gives more specific detail about the species of Salmonella, which is easy to get if you have studied it. The last is everyday food safety information that most people should know about.

Why is it Hard (for computers)?

Muli-hop is used in the first sentence (pyramidal) as systems must first know what organ connects the stomach to the colon [A12]. This question uses a lot of common sense such as knowing the order of the alphabet, e.g. letter before P, letter after G. Instead of saying Oxygen, the question is phrased with an element denoted with the letter "O", which is common information in the topic of science [A1]. Simple math is needed to answer the question, which even some systems may struggle with when connecting information, e.g. there are three minus one known species (two species) [A10]. There are also really obvious hints that are given to misdirect the computer into thinking of something else e.g. the species of Kermit the frog is needed (frogs are reptiles) [A6]. Also to make it easier for humans, the question says that a certain fish is in its name (salmon), but this misdirects the system into thinking that the answer is actually a fish, as seen in some of the answers given for the OQL style of the question [A13].

QA System Answers

> **Chat-GPT**: Helicobacter pylori (pyramidal, until last sentence), scombroid fish (OQL)
> **Bing**: Clostridium perfringens (pyramidal), reef fish (OQL)

Q4 (Math Theorem)
Pyramidal: This is a mathematical concept. The concept involves knowing two distinct domain values, a and b. Furthermore, a function f must have continuity throughout the open interval and endpoints created by the two points a and b. On the open interval between the points, f must also have derivatives at all points. The functional values at a and b must be equal, and through the application of the theorem, the result is a point d on the open interval whose derivative is zero. What is the name of this theorem used in Calculus?

OQL: This Calculus theorem requires continuity on a closed interval between two points, a and b, as well as differentiability. What theorem, which requires the functional values of a and b to match, produces that a point between the open interval has a derivative of zero?

Answer: Rolle's Theorem

Explaining the Answer
Rolle's Theorem is a mathematical concept used in Calculus. This theorem is a specific case of the mean value theorem, where when given two distinct points, a function f on the open interval must be differentiable. Furthermore, on the closed interval, f must also be continuous. The Mean Value Theorem is applicable to any functional values at b and a, however, the question asks for functional values at a and b to "be equal." This case of the Mean Value Theorem is the Rolle's Theorem, which when given two points with matching functional values, produces a point on the open interval between the two points which has a derivative of zero [F16].

Why is it Interesting?
This is interesting because Rolle's theorem was actually used to prove parts of the Mean Value Theorem. The Mean Value Theorem is a broader application of what Rolle's theorem is, but was proven by Rolle's theorem. Furthermore, Rolle's theorem has many applications in Calculus, especially when trying to simply show that a derivative or second derivative at a point on the interval is zero [F17]. The application of Rolle's theorem, although more specific in application, is useful for proving many Calculus concepts [F16].

Why is it Pyramidal?
The question is pyramidal since the first hint specifies that the concept is a mathematical concept. Furthermore, the next hints give details about the requirements of the theorem, specifying the need for continuity of a function f, on the closed interval between two distinct points [F16]. The next hint gives even more details about the need for differentiability of the function on the open interval [F17]. This narrows the possible theorems to the Mean Value Theorem and Rolle's Theorem. However, the second to last hint required for the functional values at a and b to match narrows the theorem down to Rolle's Theorem, as the Mean Value Theorem does not require matching functional values [F17].

Why is it Hard (for computers)?
This is hard for computers since the entire question is formulated with mathematical concepts and notations. There is no direct math to be done, but the listing of variables aims to confuse Chat-GPT and computers about the theorem's requirements and applications. The variables listed, which are points a, b, d, as well as the function f, all are required to keep track of what intervals are being mentioned and which value is required [A4]. Furthermore, logical reasoning is required to know that continuity on the open interval between a and b and its endpoints means creating a closed interval [A7]. This is a requirement for the application of the theorem, and is worded this way to trick computers.

QA System Answers
> **Chat-GPT**: Mean Value Theorem (Pyramidal / OQL)
> **Bing**: Mean Value Theorem / Rolle's Theorem – (Pyramidal / OQL – correct more often than not)

Q5 (Theorem)

Pyramidal: This theory introduced concepts that allowed humans to get a better understanding of the science that would help drive a war between two countries with some of the largest landmass in the world. It can help describe how objects behave in space and give a better understanding of why what you are seeing may be different from what other people are seeing. The theory was created by the same person that appreciated music throughout his life, especially an instrument that is commonly used at weddings. However, it does not have anything to do with why planets orbit around larger celestial bodies. What is this theory?

OQL: This theory gave birth to concepts that allowed people to better understand why they see the same object differently. What is this theory?

Answer: Theory of Special Relativity

Explaining the Answer

The theory of special relativity can be used to describe how spacetime works. The science that would lead to the Cold War between The Soviet Union and the United states is mass-energy equivalence. This consequence of the two postulates of special relativity can be used to calculate the energy that can be generated from nuclear fission. One of the driving forces in the war was the nuclear arms race between the two countries [F11]. The theory also has consequences such as time dilation and length contraction, which describes why objects can move faster or slower in the eyes of different people [F12]. The question specifies that it does not have anything to do with the orbit of planets which is relevant to general relativity. Special Relativity was developed by Albert Einstein, who was also known for his love of music, especially the violin [F13].

Why is it Interesting?

The theory of special relativity has allowed many different technologies to be developed. For example, the development of nuclear technology is a direct result of the theory. Other technologies such as GPS are also based on the consequences of the theory of special relativity [F14]. In addition, Albert Einstein, who developed this theory, is one of the most well known scientists of the 20th century.

Why is it Pyramidal?

The hardest part of the question is on top. This hint introduces the question as a theory but utilizes a hint that is of a different category than "science". The next hint is when the question begins to dive into the specifics of the theorem. The last hint is the most beneficial as it gives an idea about who actually created the theorem.

Why is it Hard (for computers)?

The question utilizes multi-hop in some of its hints. The computer needs to piece together countries with the highest land masses along with the wars that they were a part of. In the last hint, the system needs to put together instruments that are used in weddings, such as the violin, piano, flute, etc., with scientists. Another thing that can make the question hard for computers is how specific it needs to be. At first the computer may guess the Theory of Relativity, but the question only specifies parts that are relevant to special relativity.

QA System Answers

Chat-GPT: Theory of Relativity
Bing: Theory of Relativity

TV and Film
Q1 (*The Lion King*)
Pyramidal: In a film where the main protagonist loses their father at the hands of a relative, there is a duo. During the film, the protagonist encounters the cheerful duo which duet a song that repeats a phrase about the lack of trouble in an East African language. As a group, they journey back to the home of the main protagonist to bring peace once more from a pack of hyenas led by the antagonist. What is the name of the duo which the main protagonist encountered?

OQL: This cheerful duo sings in a musical which repeats a phrase about the lack of trouble, in an East African language, while on the protagonist's journey home. What is the name of this duo?

Answer: Timon and Pumbaa

Explaining the Answer
The duo is the meerkat and warthog duo, Timon and Pumbaa from *The Lion King*. This duo appears in *The Lion King,* which is about Simba's journey to reclaim the throne from his uncle, Scar, after his father died [G18]. Timon and Pumbaa were the duo who met Simba, and sang "Hakuna Matata," a song about "no worries" in Swahili, an East African language [G19]. As a group, they travel back to Pride Rock, Simba's home, to reclaim it from the hyenas led by Scar. Thus, Timon and Pumbaa are the duo which Simba encounters and travels with [G17].

Why is it Interesting?
This is interesting because *The Lion King* is a popular movie for children which had a remake back in 2019. This movie features the journey of Simba, who had a dark past with the death of his father as the hands of a relative [G18]. Furthermore, the duo in question, Timon and Pumbaa, are widely known for their catchy songs in the Swahili language. Their songs are very well known, especially due to their musical duet during the film itself.

Why is it Pyramidal?
First the guessers are given that this is a film. In said film, the protagonist's father is killed at the hands of their relative. Furthermore, we know that the question asks about a duo in the film. The protagonist encounters this cheerful duo and they duet about the lack of problems and worries in an East African language. This hints towards the movie being based in Africa, as well as the song,

"Hakuna Matata" [G19]. This, coupled with the group journeying back home to reclaim it from hyenas, should be enough to know the film is *The Lion King* [G18]. From there, we know the very popular duo to be Timon and Pumbaa.

Why is it Hard (for computers)?
This stumps computers due to the question being about a particular duo in a film, rather than the film itself. The mention of a duet about the lack of trouble, as well as the East African language used in the song, probe the movie to be *The Lion King.* Bing has no idea what the movie is based on keywords, but Chat-GPT can identify the musical being "Hakuna Matata" and *The Lion King* [A7]. However, Chat-GPT cannot determine which duo sings "Hakuna Matata". This is likely due to the common sense aspect of the question, as well as a sense of misdirection when talking about the film and asking about the two characters [A8].

QA System Answers
Chat-GPT: Jambo Bwana (Pyramidal) / Rafiki and Simba (OQL) / Occasionally doesn't guess
Bing: Unable to determine film (Both)

Q2 (Korean Actor)

Pyramidal: This actor appears in a popular tv show in which this person slaps the main character for not being able to flip a red tile. This actor played the opposite of a model highschool student in his first lead role in a show about a romance between his character and a teacher. In a science fiction show that takes place in space, the character of this actor gets selected on a mission and is given the role of a captain. Name this actor who also plays the lead role of a popular apocalyptic film which mostly takes place on a train.

OQL: Name this actor who plays the lead role of a popular apocalyptic film where characters try to not die on a train and whose Korean film director was not associated with the award winning film Parasite.

Answer: Gong Yoo

Explaining the Answer

In the show Squid Game, Gong Yoo's character slaps Gi-hun since he can't win at Ddajiki (fails to flip over the red tile with the blue one) [G3]. His first lead role is in a show called Hello My Teacher, which is a romance about a teacher and troublemaking student. He also plays the captain of the space crew of the sci-fi show called The Silent Sea [G1]. The two most popular apocalyptic train films by Korean directors are Snowpiercer and Train to Busan. Bong Joon-ho directed both Parasite and Snowpeircer, so the answer must be the lead actor in Train to Busan, which is Gong Yoo [G2].

Why is it Interesting?

Gong Yoo is a famous actor in Korea who appears in many popular TV series/movies like Squid Game and Train to Busan . He has also received many film awards such as the Best Actor for the Asian Film Awards in 2017 [G1]. Even outside Korea, he has accumulated a fairly large fan base [G4].

Why is it Pyramidal?

The first sentence asks about a very specific scene that this actor appears in that one would probably wouldn't know about unless you have recently watched the series. The next sentence talks about his earlier roles, which is not the most popular thing that is known about him. The third sentence talks about one of his most recent popular TV shows that he stars in, making it easier to guess. The last sentence is the easiest as it gives information about the lead role in one of his most popular movies.

Why is it Hard (for computers)?

Because many QA systems are trained on English databases, answers will be biased toward English sources, which could explain why systems gave an English actor, even though the answer is about a Korean actor [A2]. The main clue that systems struggle with is the apocalyptic train film. In English search engines, the first result that pops up is Snowpiercer, but in any Korean search engine, the first result is Train to Busan. Also to help humans distinguish the answer (for the OQL), there is a negation included where it says that the director was not associated with the award winning film Parasite. Systems don't seem to recognize the not, and answer Chris Evans (lead role of snowpiercer) even though Snowpiercer and Parasite are by the same director [A14]. The slapping and red tile scene mentioned in the first sentence of the pyramidal question is very unique to this actor, so by the end of the last sentence and through process of elimination, humans can infer it is not Chris Evans. QA systems like GPT will still give answers even if a clue seems wrong by their answer given, resulting in the wrong answer, or just ignore clues that might be important [A7].

QA System Answers

Chat-GPT, **Bing**: Chris Evans
(pyramidal + OQL)

Q3 (Minions)

Pyramidal: This film falls under the category of comedy. The film is animated, and revolves around the childhood of the main character from the series films. The series of films revolves around the main character's desire to become a supervillain. The release of the movie sparked the internet phenomenon where teenagers who went to watch the film wore suits. One of the companions of the protagonist is "Bob," who is small, yellow, has two eyes, and often wears overalls. What is the name of this film where the protagonist, who is portrayed as a child, tries to become the greatest supervillain with his minions?

OQL: This animated comedy film about a child trying to become the best super villain sparked the internet phenomenon where teenagers wore suits to watch this film. What is this movie in which the main protagonist, who is portrayed as a child, begins his journey to become the best supervillain with his minions?

Answer: *Minions: The Rise of Gru*

Explaining the Answer

The *Despicable Me* series is a series of animated comedy movies about the main character, Gru, who aims to become the best supervillain [G21]. This series resulted in the internet phenomenon and many memes where teenagers wore suits to watch the film. In particular, the 2022 movie release *Minions: The Rise of Gru*, sparked the most recent trend, and this film depicts Gru during his childhood [G20]. Furthermore, Gru's companions are the Minions, who are generally small yellow creatures that often wear overalls. One of Gru's companions is named "Bob," and the question describes his features [G21]. Thus, the answer is *Minions: The Rise of Gru*, the film in the *Despicable Me* franchise which revolves around Gru's childhood.

Why is it Interesting?

This is interesting because this film transpired an online meme and evolved into a crazy phenomenon about teenagers wearing suits at the theaters. The phenomenon became too out of control to the point where theaters started to ban the wearing of suits to watch the film, and made headlines in 2022 when the movie first aired [G20]. Furthermore, this film is the latest installment in the very popular Universal Studios'

franchise which has had over five films created [G21].

Why is it Pyramidal?

The question is Pyramidal as it starts off with a broad category about the film being a comedy film. Details further show that the film is an animated film about the childhood of the main protagonist who desires to become a supervillain [G21]. This narrows down the possible lists of films drastically, as there are not many animated films about the childhood of supervillains. Further hints about the internet phenomenon that transpired from the film, as well as the companion named "Bob" who is yellow and wears overalls, signal that the film is a part of the *Despicable Me* franchise [G20]. Thus, piecing together the film series and the fact that the film is about the main character's childhood, the answer, *Minions: The Rise of Gru* should easily be obtainable.

Why is it Hard (for computers)?

This is hard for computers since this film is more of a current event, as the film was released in 2022 and ChatGPT retains data from 2021 and prior [A17]. Thus, Chat-GPT does not know when *Minions: The Rise of Gru is released,* but has some knowledge about the film and franchise. Furthermore, I used a bit of common sense and logical reasoning which relies on being able to identify that "Bob," with his identifying features, is a part of the *Despicable Me* franchise [A7]. These cause Chat-GPT to lock in the answer of *Despicable Me*, the original movie, but does not take into account the previously mentioned part about the film being focused about the main character's (Gru's) childhood [A8].

QA System Answers

> **Chat-GPT**: Despicable Me (Pyramidal / OQL)
> **Bing**: Minions (Pyramidal) / Minions: The Rise of Gru (occasionally – OQL)

Q4 (Biopic)

Pyramidal: In the National Film Registry, there was a film that was about a series of interviews following the death of an influential publisher and there is now a biopic about one of the members of staff involved in making that film. In the biopic, who was the well-known tv personality that played a well-known author and political activist who was running for a political position in the most populous U.S. State and wrote about health violations in a major U.S. city causing public and government concerns?

OQL: This well-known tv personality played a minor role in a biopic about a member of staff involved in the making of a film, which was about a series of interviews about the death of an influential publisher, that made it to the National Film Registry. The minor role in this film was running for a political position in the most populous state in the United States and was known for writing a narrative about the health violations for laborers in a major U.S. city which raised public and government concerns. Who was the actor who played that role in the biopic?

Answer: Bill Nye

Explaining the Answer

Bill Nye played Upton Sinclair in the film "Mank" [G5]. Upton Sinclair was known for writing the book The Jungle which criticized the meat packing industry in Chicago which raised public and government concern. He was also running for Governor of California [G6][G9]. The film Mank was a biopic about Herman Jacob Mankiewicz who was the screenplay writer of the film "Citizen Kane" which is about a series of interviews following the death of an influential publisher named Charles Foster Kane [G7]. "Citizen Kane" is in the National Film Registry [G8].

Why is it Interesting?

It is interesting because Bill Nye usually guest stars in shows and movies as himself and he rarely plays roles not having to do with himself or science. In the film Mank, he plays another historical figure.

Why is it Pyramidal?

The question starts off with talking about the National Film Registry and there are many films in there. Then, it narrows down to a specific film because the question gives a synopsis of the film which is "Citizen Kane". Then the question talks about the biopic that was created about a member of staff of that specific film. There aren't many biopics made of film staff or any from that small subset. In that biopic, Upton Sinclair is seen running for Governor of California who is played by Bill Nye.

Why is it Hard (for computers)?

It might be difficult for computers because anything more than a degree of connection might be too much. The question involved multiple degrees of connection whereas the answer chatgpt gave were only 1 degree of connection with 2 branches. This technique is called multi-hop [A3]

QA System Answers

Chat-GPT: Dermot Mulroney (Pyramidal) | Ben Affleck (OQL)
Bing: James Woods (Pyramidal) | Sean Penn (OQL)

Q5 (Family Life)

Pyramidal: There is a 1990's movie about romance between a businessman and a sex worker, who is played by the same woman who went on to be in Ocean's Eleven and Ocean's Twelve. This film features an English song from the 1960's with the almost same name. In 2003, a south asian country released a romantic-comedy-drama film, which featured a South Asian remake of the English song previously referenced. How many girls did the main actress of the south asian movie adopt?

OQL: There was a 1990's movie, which features an English song from the 1960's with almost the same name, about romance between a businessman and a sex worker, who is played by a woman who went on to be in Ocean's Eleven and Ocean's Twelve. How many girls did the main actress of the 2003 South Asian romantic-comedy-drama film which featured a south asian remake of the english song previously referenced adopt?

Answer: 34

Explaining the Answer

Preity Zinta is a famous South Asian actress who adopted 34 girls from the Mother Miracle orphanage[G10]. One of the biggest movies she starred in is one of the staples of Bollywood cinema. It is called *Kal Ho Na Ho* [G11]. In this movie, there is a song called "Pretty Woman" [G12] which is a remake of the song "Oh, Pretty Woman" by Roy Orbison. In 1990, there was a movie with a similar name to the song called *Pretty Woman* which featured the song "Oh, Pretty Woman." [G14]. The movie is a romance movie between a businessman and a sex worker [G15]. It stars Julia Roberts who went on to star in both Ocean's Eleven and Ocean's Twelve [G16].

Why is it Interesting?

It's interesting because for many fans of Bollywood and many Hindi speaking people, this is a very obvious reference when watching the movie *Kal Ho Na Ho*, but those outside of that bubble have no idea. There are many songs in Bollywood and the rest of south asian cinema that take english songs and even plot points and remake them into their own with their own twist to them. The chorus in both the original and the Bollywood remake is very obvious from the melody, tune, even parts of the lyrics.

Why is it Pyramidal?

This was pyramidal because there were a lot of movies in the 1990's and many with romance. The plot point that the question specified was a little obvious, but not too specific. The movie got specific when the question referenced one of the cast members being in 2 other movies. It got more specific when it mentioned the song with almost the same name. There were many South Asian films released in 2003 and India is just one of the countries. There was only 1 that featured the song in question provided that the song was figured out, and the main actress of the film was only 1 and the information asked was just a lookup of facts.

Why is it Hard (for computers)?

This may be hard for computers because there may be too many connections to make and one of the mistakes the computers all made is that it thought that the question was talking about how many children the actress adopted in the movie, however the question was not phrased that way. It was phrased such that it should assume that the question was talking about real-life and that the film mentioned was just a reference. This could be classified as a Common sense adversarial because the AI assumed it was talking about what happened in the movie, but it was not [A1].

QA System Answers

    Chat-GPT: 1 (Pyramidal) | 0 (OQL)
    Bing: 1 (Pyramidal) | 0 (OQL)

Music

Q1 (J-pop)

Pyramidal: Formed by the record label just smaller than Universal Music Group, this duo originally created songs based upon stories created from a literature based social media website. One member of this duo is a producer who has created the same type of music associated with the musical software developed by Crypton Future Media, Hatsune Miku. Their debut song went viral on social media during its initial release, which is a song that includes themes of suicide and references to the personification of death in Greek mythology. Name this musical duo who is also most notable for creating music for animated series such as Oshi no Ko and Beastars.

OQL: Name this musical duo which is formed by the record label just smaller than Universal Music Group, and is well known for creating music for an animated series about an idol and a one about anthropomorphic animals.

Answer: YOASOBI

Explaining the Answer

Universal Music Group is the largest record label, so the one just smaller than that would be the second largest, or Sony Music Entertainment (SME) [H5]. YOASOBI is a musical duo formed by SME to make songs about stories from a novel-centered website called Monogatary.com. One member of the duo, Ayase, is a vocaloid producer [H1]. Hastune Miku (by Crypton Future Media), is the most popular vocaloid software [H6]. The duo's first song, "Racing Into the Night," is about suicide and a man who is fascinated by Thanatos, the personification of death in Greek mythology [H3]. The duo has also made the opening and ending for the animated series called Beastars (it's about anthropomorphic animals), and the opening for a recent series called Oshi no Ko [H2].

Why is it Interesting?

YOASOBI is a popular musical duo which has garnered lots of attention throughout social media sites [H4]. They were even assigned to write music for popular Japanese animated TV series, which makes them more notable as music plays an important role in Japanese animated series [H2]. There are also many covers (both instrumental and vocal) of their songs online.

Why is it Pyramidal?

The first sentence talks about the origin of the duo, which most people probably don't know about. The second sentence is easier as it gives more information about the type of music that they are associated with. The third sentence gives info about their first song, which happens to be one of their most popular ones. The last sentence gives info on what the duo is most popular for.

Why is it Hard (for computers)?

The question uses several instances of multi-hop, which systems may struggle with, e.g. needing to know the two biggest music industries and also what kind of music Hatsune Miku is associated with [A5]. The main hint about the tv series is related to Japanese culture, in which QA systems may get wrong as they are trained with mostly English datasets. Animated series in Japan and America differ in the fact that music plays a more important role in the former. People will often talk about the opening and endings of a Japanese animated series, but not so much about an American animated series. QA systems will most likely assume animated series as American even though music doesn't play as much of an important role [A2]. This could be why some answers given were about non-Japanese music groups.

QA System Answers

    Chat-GPT: The Living Tombstone (pyramidal, until last sentence), HoneyWorks (OQL, answer varies)

    Bing: Yorushika (pyramidal), The Living Tombstone (OQL, answer varies)

Q2 (Vivaldi)

Pyramidal: This composer was "rediscovered" in the 20'th century after manuscripts were recovered by one of the main libraries of the city that is known to have one of the largest collections of ancient Egyptian artifacts. He taught as the "viola all'inglese" after his appointment at a place that was well known for its groups that were the same type of ensembles that the Spice Girls and Destiny's Child are. This person's compositions are identified by their place in a catalog with the same abbreviation as what people use for camping, outdoor living, and road trips. Some of this person's most famous works include "The Four Seasons" and "Gloria". Who is this person?

OQL: Which person composed famous pieces such as "The Four Seasons" and "Gloria"?

Answer: Antonio Vivaldi

Explaining the Answer

Vivaldi's work was seemingly forgotten until the 20th century when a series of events helped to restore his reputation. One of these events was when the Turin National University Library rediscovered many of his manuscripts thanks to a generous donation. He worked at the Ospedale della Pietà, which was known for its all-female musical ensembles, as the viola all'inglese. Vivaldi's works are categorized by its position in the "Répertoire des oeuvres d'Antonio Vivaldi" where each number is identified by their "RV" number, which is also an abbreviation for "recreational vehicle". Finally at the end, Vivaldi's most famous works are "The Four Seasons", a set of four violin concertos, and "Gloria".

Why is it Interesting?

Vivaldi is known as one of the greatest Baroque composers that existed. Although people may not know his name, they may recognize some of his compositions like "The Four Seasons". He has also had some influence on modern media. His compositions have been used in shows like The Sopranos.

Why is it Pyramidal?

The first sentence gives the guesser the hint that the answer is a composer and probably a famous one as well. After, the hints become a little easier as it requires more modern knowledge that more people may know. The next hint gives a direct hint about the answer to the question. The last part of the question is the easiest part as it directly names the works that Vivaldi composed which can lead the guesser directly to the answer.

Why is it Hard (for computers)?

The question involves multiple multi-hop portions. In the first sentence, the computer has to connect the city that has one of the largest collections of Egyptian artifacts to what was found there.

QA System Answers

Chat-GPT: Johann Joachim Quantz (until the last sentence)

Bing: Francesco Maria Veracini (until last sentence)

Q3 (VTuber)

Pyramidal: This singer is a Japanese artist who initially debuted in 2018 as an independent artist. The first original song released is named after the type of small Solar System body composed of ice and dust, which releases gasses as it orbits the Sun. The following year after their debut, the artist signed a contract with INoNaKa Music. Her first single release was under Cover Corp. in 2020. Her first album was released in Fall of 2021 and featured her newest song, "Stellar Stellar." Who is this artist that became the first Virtual Youtuber to appear on The First Take?

OQL: This singer is a Japanese artist who initially debuted in 2018, releasing their first original song, "Comet." Her first single release was under Cover Corp. in 2020, and her first album featured the song "Stellar Stellar." Name this artist that also became the first Virtual Youtuber to appear on The First Take.

Answer: Hoshimachi Suisei

Explaining the Answer

Hoshimachi Suisei is a Japanese Virtial Youtuber (VTuber) who is currently a part of Hololive Production (Hololive), a talent agency that works under Cover Corp [H13]. Suisei debuted as an independent VTuber back in 2018, releasing their first original song, "Comet," the name of the type of small Solar System body composed of ice and dust [H14]. In 2019, Suisei joined Hololive under their music company, INoNaKa Music, and released her first single, "Next Color Planet" in 2020. Her first album *Still Still Stellar* was released in 2021 with and includes her song, "Stellar Stellar," which she performed as the first VTuber on The First Take. The First Take is a widely known Youtube channel and music show where artists, predominantly Japanese, perform their songs in a single take [H16].

Why is it Interesting?

Hoshimachi Suisei's rise to stardom in the online world was primarily due to the Covid-19 outbreak which led millions to search for entertainment from the comfort of their homes during quarantine. Suisei was one of the entertainers and music artists who took over the internet during this era, and is well known for her entertainment and musical talent [H13]. As mentioned in the question, one of the greatest accomplishments is being the first VTuber to appear in The First Take, which is interesting since previous singers were all publicly known [H16].

Why is it Pyramidal?

This question opens off with the broad category of Japanese singers. This is further narrowed down by the initial song release being "Comet" and the artist's signing into Hololive's music agency. This narrows the possibilities by quite a bit to VTubers, and is further narrowed by the mention of Suisei's first single and album [H15]. The song name alone should be enough to pinpoint the singer. The very last clue about the singer being the first VTuber on The First Take, should give the singer away as Hoshimachi Suisei, as no other VTuber was on this show [H16].

Why is it Hard (for computers)?

The question is hard for computers because a common link was used to connect Suisei's first original song to a comet [A5]. This, along with the need to have logical reasoning to know the music company is under Hololive and Cover Corp., only throw off Chat-GPT even more. Lastly, The First Take performance is on the newer side, which Chat-GPT may not know about, along with the whole idea of VTubers being pretty obscure to the average person [A17].

QA System Answers

Chat-GPT: AZKi (Pyramidal / OQL)
Bing: Hoshimachi Suisei (using the final hint about The First Take – Pyramidal / OQL)

Q4 (Classical)

Pyramidal: In the largo movement in this piece written by the same guy who wrote the two times a dozen preludes, the harmony contains triplets of eighth-notes as the key changes from a key 1 sharp less than G-sharp minor to a key with 1 more flat than A-flat major. This piece was written for an instrument with 22 times more keys than the strings on a violin, and was published by Julian Fontana, who was not the same person that composed this piece. Although a bit more nocturnal, this piece shares similar resemblances to Beethoven's Moonlight Sonata, sharing the same key and key change. Name this famous solo piece by Frédéric Chopin that begins with a whole note at sharp equivalent of A-flat, followed by a cycle of broken chords and is written in a key 2 sharps less than D-sharp minor.

OQL: Name this famous solo piece by Frédéric Chopin that is written in a key 2 sharps less than D-sharp minor but 1 more than F-sharp, which is made to be played on the instrument with 88 keys, and begins with a whole note at the sharp equivalent of A-flat, followed by a cycle of broken chords.

Answer: Fantaisie-Impromptu

Explaining the Answer

In the largo movement of Fantaisie-Impromptu the left hand plays tuplets of eight-notes and the key changes from C-sharp minor (1 less than G-sharp) to D-flat major (1 more than A-flat) [H8]. A dozen is 12, so 2x12 = 24. Chopin composed the 24 preludes. A violin has 4 strings and a piano has 88 keys (so 44 times more keys than strings). The piece was actually never published by Chopin himself, but by his student, Julian Fontana [H7]. Fantaisie-Impromptu is often compared with Beethoven's Moonlight Sonata as they share similar tempo, key signature and key-change, although Fantaisie-Impromptu sounds a bit more nocturnal [H9]. Fantaisie-Impromptu is a piano piece, written in C-sharp minor (2 sharps less than D-sharp, and 1 more than F-sharp), is defined with its intro with a whole note at G-sharp (sharp equivalent of A-flat), which is then followed by a cycle of arpeggios (or broken chords) [H8].

Why is it Interesting?

Fantaisie-Impromptu is one of Chopin's most well known and played solo piano pieces to this date [H10]. In the piano community, this song is often played in recitals and regarded as one of the harder songs to play. There are also many covers of this piece by both professional and amateur pianists online [H11].

Why is it Pyramidal?

The first sentence talks about the middle movement of the piece, which isn't very well known for those who haven't played it or listened as a whole before. You also need to know a fact about Chopin's other pieces to know that Chopin made it. The next clue gives more information about the intended instrument and gives more hints toward the composer as it names his student. The third sentence gives another popular piano piece that is often compared to this piece. The last sentence gives the actual composer, key signature, and the defining introduction of the piece.

Why is it Hard (for computers)?

This question uses a bunch of simple math combined with basic music theory which QA systems struggle with [A15]. For example the question talks about the key signature and changes of the piece, but never specifically states the actual one e.g. instead of C-sharp minor, the question states 2 sharps less than D-sharp. Systems must know how many sharps the different time signature has, then add or subtract sharps, and then figure out what key signature that one is. This is also in a sense a multi-hop question because of its nature [A3]. Other uses of math used are two times a dozen to represent the 24 preludes, and also the fact that the piano has 44 times more keys than the strings of a violin. These instrumental and key signature facts are easy for humans who know a bit of music theory, but not for systems as they will give answers that have the wrong key signature [A10].

QA System Answers

> **Chat-GPT**: Nocturne in C-sharp minor (pyramidal + OQL)
> **Bing**: Raindrop prelude (pyramidal), Nocturnes, Op. 27 (OQL, answer varies)

Q5 (A cappella)

Pyramidal: This style of singing can find some of its origins with a type of vocal music that is named after someone who played a key role in converting the people of a country which is known for its football leagues into its main religion during a period of time where its leader was changed from a period of years to decades. In recent years, this singing style has gained a growth in popularity thanks to films like one where the actress, who played a princess who was cheated on by her prince, goes on to win the national championship for this singing style. Originally, the name of this singing style was used to describe music that was only expressed through voices. What is this style of singing?

OQL: This singing style has gained a growth in popularity thanks to films like one where the actress, who played a princess who was cheated on by her prince, goes on to win the national championship for this singing style. What is this style of singing?

Answer: A cappella

Explaining the Answer

A capella singing style can have its origins traced back to creation of Gregorian chants in the middle ages where monks would sing chants without musical accompaniment. The name of these chants came from Pope Gregory I, responsible for converting anglo-saxons to Christianity, who was attributed to its standardization. England is known for its popular football leagues and teams such as Manchester United and the Spurs. A cappella gained popularity in the last two decades thanks to movies like *Pitch Perfect* where actress Anna Kendrick, who played Cinderella in the movie *Into The Woods*, joins an a cappella group and goes on to win the national championships with her group. The name of the singing style can be used to describe isolated vocal tracks that used to have instruments [H12].

Why is it Interesting?

In the past decade and a half, a cappella singing has been gaining popularity thanks to films like the pitch perfect series and groups like Pentatonix. A cappella music is also very different sounding from its counterparts that have instrumentation.

Why is it Pyramidal?

The first hint tells that the answer to the question is a singing style and gives some information about its origins that would only be known if you had knowledge of soccer as well as religious history. The next hint talks more about a cappella itself. It is easier that the previous hint as the information you need becomes more modern. The last sentence gives a direct hint to what singing style the question is asking about. The hints go from hardest to easiest throughout the question.

Why is it Hard (for computers)?

The first couple of sentences use multi-hop in order to trick the computer. The first hint requires the computer to know the country that the question is asking about, as well as the time period where the time between leaders could be from as short as a couple of years to decades. The computer then needs to use that information to get the answer to the first part of the question. In the second hint, the computer needs to understand which films the question is asking about in order to guess correctly.

QA System Answers

    Chat-GPT: Qawwali
    Bing: qawwali

Lifestyle
Q1 (Fast-Food Chain)

Pyramidal: In a collaboration with the game Donkey Kong Country, this company advertises one of its milkshake products in a 1995 commercial. Originally established in Japan by a businessman whose brother also established the conglomerate most notable for selling instant noodles packs, this company is widely seen across East Asian countries. The company took over the spot of the most popular fast-food chain in the birth country of the founder. Name this fast-food chain which is most famous for selling burgers.

OQL: Name this burger selling company that was originally established in the largest island country in East Asia and has also taken over the most popular fast-food chain in the birth country of the founder.

Answer: Lotteria

Explaining the Answer

In an old commercial, Lotteria uses the game Donkey Kong Country to advertise their Super Donkey Kong milkshake [I3]. Lotteria was established in Japan (largest island country in East Asia) by a Korean businessman whose brother founded the food company Nongshim, which is most notable for selling Nongshim ramen [I2]. Lotteria has many chains across East Asia and is the number one most popular fast-food chain in Korea. The most popular items on Lotteria are their burgers [I1].

Why is it Interesting?

Lotteria is basically the McDonalds of Korea and is pretty popular in other East Asian countries. Fast-food chains originated in America, and American fast food chains have basically taken over the world, but Lotteria is significant as it is a foreign born chain, and holds a number one spot in a country with high GDP [I4].

Why is it Pyramidal?

The first sentence talks about a very old commercial that happened when Youtube wasn't even around so there isn't much info of it online. You wouldn't really know about it unless you actually saw the commercial. The second is much easier as it gives hints about the origin and founder. The third and fourth sentences are the easiest because it states the number one fast-food chain, and there really aren't any others that aren't from America.

Why is it Hard (for computers)?

Since the question is about a fast-food chain, many QA systems will be biased towards fast-food chains originating in America. While Lotteria isn't really known in the U.S., it is the most popular in Korea, but a lot of systems aren't Korean based [A2]. The hint that trips most systems up, making them guess McDonald's., is the question embedding of the number one fast food chain in a country. While McDonald's is the number one fast-food chain in a lot of countries, it is pretty obvious for a human to see from the question that the fast-food chain is not from America, narrowing the answer down to Lotteria [A8]. There is also multi-hop used in the pyramidal version as the system must first know which food company founder has a brother that also founded another food company that sells ramen packs [A3].

QA System Answers

    Chat-GPT, **Bing**: McDonald's
    (pyramidal, OQL)

Q2 (Video Game)

Pyramidal: This game is the newest released game by a well known Chinese company which develops video games. The company behind the game is well known for releasing a worldwide sensation using an anime art style. The most well known game by the previously mentioned company is their open world action role-playing game, where the story revolves around a traveler who was separated from their sibling in the world of Teyvat. In the company's newest game, there is a character whose name is the lunar calendar date of when the game was publicly released. The game revolves around the main protagonist's journey across the universe in a train, and is a turn-based role-playing game. What is this newly released game?

OQL: This new game is made by the same company who released the popular, open world, role-playing game where players can explore the world of Teyvat to try and reunite with their sibling. The game was released on the same date matching a playable character's name using the lunar calendar, and is about the main protagonist's journey across the universe. What is the game in question?

Answer: Honkai: Star Rail

Explaining the Answer

Honkai: Star Rail is miHoYo's newest released game. The company is a Chinese videogame company who created the hit sensation, Genshin Impact, where players explore an open world role-playing game in the land of Teyvat [I14]. Thus, the company connecting the games is miHoYo. In Honkai: Star Rail, one of the characters is named March 7th, which when converted from the Lunar Calendar, equates to April 26th, the release date of the game [I15]. Lastly, Honkai: Star Rail involves traveling across galaxies in a train and is played in a turn-based manner.

Why is it Interesting?

This is interesting because this is the newest title in miHoYo's roster of games [I14]. This game, on the first day of release, obtained over a million players in the Americas alone based on the number of uniquely generated user IDs in the region. Furthermore, Honkai: Star Rail had been announced over a year ago, and was finally released as of the day of writing this question [I15].

Why is it Pyramidal?

The question broadly opens with a game that is newly developed by a Chinese game company. The next part about the company creating the game that explores the world of Teyvat should immediately hint that the company in question is miHoYo since they made Genshin Impact [I14]. Drawing this connection, the game in question developed by miHoYo has a character named after its release date on the Lunar Calendar. This character in question is March 7th, which equates to the April 26th release date [I15]. The hints, along with the description of the game being turn-based, should be enough to know that the game is the newly released, Honkai: Star Rail.

Why is it Hard (for computers)?

This question is hard due to the need to find the common link between the games, which is the company miHoYo [A3]. Furthermore, Chat-GPT does now have access to the knowledge that his game is one of the newly released games, which could be considered as a current event [A17]. Thus, Chat-GPT thinks the game is Genshin Impact rather than the new game by miHoYo due to the limited knowledge from before the game's release.

QA System Answers

Chat-GPT: Fisheye Placebo (Pyramidal) / Genshin Impact (OQL)

Bing: Zenless Zen Zero (Pyramidal) / Genshin Impact (OQL)

Q3 (Fashion Brand)

Pyramidal: In one of this brand's Spring-Summer shows, models walk on the runway with an identical version of themselves. A popular item from this brand has its handles created by the stuff eaten by a species of bear that has similar fur to a polar bear, but also with black spots. This brand's founder's first and last name both contain the characters of the brand name itself. A rapper's most famous song featured the artist repeatedly saying this brand name, followed by the word that is used to refer to a group of thugs and also begins with the same letter as this brand's name. Name this brand whose logo has two interlocking letters which comes after the first letter in Fila, but before the first letter in H&M.

OQL: Often flaunted by hip hop artists in their music videos, name this fashion brand whose logo is an intersection of the characters in google and gigabyte, excluding the vowels.

Answer: Gucci

Explaining the Answer

In their most recent fashion show, Gucci has a show featuring models and their twin version of themselves [I9]. A polar bear has white fur and a bear with white fur and black spots is just a panda. Pandas eat bamboo, and Gucci has a famous product line of bamboo bags that has a bamboo handle [I6]. The founder of Gucci is Guccio Gucci. The brand name "Gucci" appears in both his first and last name [I5]. Lil Pump's (rapper) most famous song is "Gucci Gang", where he just says the phrase "Gucci Gang" over and over again (gang is used to refer to a group of thugs) [I8]. The intersection of the characters in Google and gigabyte, excluding the vowels, is just two G's. Gucci's logo is just two interlocking G's [I5]. The letter G is in between F and H (alphabetically).

Why is it Interesting?

Gucci is one of the most popular fashion brands in the world, collaborating with various musical artists/groups and other famous brands. It has a strong presence in the fashion industry as the brand is well known for its unique craftsmanship and luxury items [I7]. Owning one of these items from this brand will definitely make one stand out in a crowd.

Why is it Pyramidal?

The first sentence talks about a fashion show which many people who have heard of the brand name probably don't watch or care about. The next sentence is easier as it gives a sentence about a popular item that is known to be created by the brand, although still quite difficult, as the item is pretty old. The next sentence gives clues about the founder, who has a very unique name. The fourth is even easier as it references a popular rap song with over 1 billion views that uses the brand name. The last is the easiest as it describes the logo of the brand.

Why is it Hard (for computers)?

The first sentence references a more recent fashion show in QA systems like gpt don't have information about [A17]. In the pyramidal version, there is a very unique description of a panda, that shouldn't be hard for humans to get, but may confuse the system as pandas aren't really commonly described like that. There is also some common sense needed, where some systems don't get, such as knowing what the first letter of a word that is already given to you and also which letter falls in between "F" and "H" [A8]. In the OQL version of the question, the question uses some basic logical reasoning/set theory to get the logo of the brand. It asks to take the intersection of characters of two small words, which is easy for humans to do and the answer is pretty obvious, but systems struggle with this, giving the wrong answer [A7]. The OQL version also asks for an exclusion of vowels, which certain QA systems may not get as they commonly struggle with negation and such [A14].

QA System Answers

Chat-GPT: Fendi (pyramidal), BAPE (OQL)

Bing: Hermes (pyramidal), BAPE (OQL)

Q4 (Brand)

Pyramidal: This brand shared a name with a now defunct airline founded in the middle east in the mid 1900s. After the first time it was shown off to the public, they were not shown again until a month later when they were seen in every game that was played with the wearer afterwards. The producer of this brand has its headquarters in a city that shares part of its name with an animal that likes to eat wood. The company specializes in creating gear that individuals who like to travel on foot would use. The logo that represents the brand is said multiple times in a song by Drake that goes by the same name and also shares the former name of a video game character that wears a red hat and blue overalls. What is this brand?

OQL: This brand's logo shares a name that a video game character that wears a red hat and blue overalls used to have. What is this brand?

Answer: Air Jordan

Explaining the Answer

The Air Jordan brand was first created for Michael Jordan to wear during his games during his time with the Chicago Bulls in 1984/1985 [I10]. he brand shares a name with an airline that was originally named "Air Jordan", which was later changed to "Air Jordan of the Holy Land" [I11]. This airline was based in the country of Jordan and was founded in 1950. Michael Jordan wore the shoes for the first time against the Philadelphia 76ers but did not wear them again until one month later on December 20 [I12]. The company that produces Air Jordan basketball shoes is Nike, Inc. Its headquarters is in Beaverton, Oregon. Nike specializes in designing footwear and other equipment that would be useful when exercising. The logo of Air Jordan goes by the name of "Jumpman". In 2015, Drake and rapper Future released a song of the same name that references the logo within it. The logo also shares a name with the old name of the video character Mario.

Why is it Interesting?

The Air Jordan brand is one of the largest basketball shoe brands in the world. In 2022 alone, the brand recorded over $5 billion in sales [I13]. The brand is also associated with the legendary basketball player Michael Jordan as it was first developed for him to wear before branching out into the public. Air Jordan shoes are valuable to collectors and fans of all ages. The brand has become one of the key basketball shoe brands in the industry.

Why is it Pyramidal?

The first hint tells that it is a brand but the rest of it is hard to know unless you have a lot of knowledge unrelated to the topic. After, the hints begin to talk about the history of the brand and give information that people who have knowledge about the brand would know. The next hint talks about the producer of the brand and relevant information about it. The latter parts of the question all give hints directly related to the brand, brand image, and logo.

Why is it Hard (for computers)?

The question utilizes multiple multi-hop components. For example, the computer needs to connect an animal that likes wood, which in this case is a beaver, and connect it to a city, Beaverton [A8]. This is also used in the last part of the question when the computer has to extract information about a song and a video game character in order to connect it to not even just the brand itself but its logo.

QA System Answers

Chat-GPT: Jumpman
Bing: Cotopaxi

Q5 (Social Media)

Pyramidal: There is a social media website that utilizes forums and communities (one can even say subcultures) to sort out and communicate with others anonymously. This social media website has a forum where users who want to rant about their situations, whether problematic of not, to do so. Its posts are often reposted on other social media sites for an even bigger expanding audience to empathize. What is the name of the community?

OQL: What is the name of the subforum in the forum-style social media website where users rant about their situations for people to empathize with which garnered people to repost them on other social medias?

Answer: r/TrueOffMyChest

Explaining the Answer

The forum style social media mentioned in the question is Reddit. Reddit's format is that they have "subreddits" which are sub forums about various topics starting with "r/". One of which is called "r/TrueOffMyChest". "r/TrueOffMyChest" is a subreddit where users either complain, rant, vent, or get something off their chest to the internet often because they cannot tell others around them in real life [I16]. This specific one garnered much attention from users outside of the website and it gained a trend of people copy-pasting or screenshotting them and reposting them to other social media websites, more prominently TikTok [I17].

Why is it Interesting?

This is interesting because this questions is about Internet culture and this specific subreddit is a perfect insight as to how not only how internet culture is, but it also gives an insight as to what was mainstream culture, people's mental states, the political and economic state of the world at the time, and it also gives a peek at the social and family values. It is the most accurate documentations of turmoil that is going on in the average person's mind in the world for future historians to reference.

Why is it Pyramidal?

This question is Pyramidal because it starts from a broad topic which is social media. Then it narrows down by saying it utilizes forums and anonymity. It further narrows down the specific community by describing its users. This could still be many, but the one that sealed it, was the fact that there is now a trend of reposting the posts from this community, which only leaves r/TrueOffMyChest.

Why is it Hard (for computers)?

This question has to do more with current events which may be difficult for computers [A17]. It probably cannot understand video content as of the moment so it cannot take that data into account as much. Current trends are not the computer's strong suite because it takes a while for a trend to even be realized by society. This is where AI is not trained to look at society and what it is doing [A2]

QA System Answers

> **Chat-GPT**: Reddit (Pyramidal) | r/AmItheAsshole (OQL)
> **Bing**: r/rant (Pyramidal) | r/rant (OQL)

Sport
Q1 (UFC)
Pyramidal: Vanessa Demopoulos defeated Sam Hughes with this in the fourth round. Tony Ferguson used this against his opponent for the interim Lightweight Championship. Chael Sonnen received this from Anderson Silva, failing to get the Middleweight Championship. This action is used against someone in an attempt to stop circulation to the brain, which uses one's body part to form a shape similar to the ring used in the Ultimate Fight Championship (UFC), but with five less sides. Name this move which is used commonly in martial art combat sports such as Brazilian jiu-jitsu.

OQL: Tony Ferguson used this against his opponent for the interim Lightweight Championship, Vanessa Demopoulos also used this against Sam Hughes in the fourth round of their match, Chael Sonnen received this too from Anderson Silva. Name this move used by these fighters to prevent blood circulation to the opponents brain.

Answer: Triangle Choke

Explaining the Answer
In the LFA 85, Vanessa Demopoulos defeated Sam Hughes with a triangle choke during the fourth round [J4]. In UFC 216, Tony Ferguson defeated Kevin Lee with a triangle choke [J3]. In UFC 117 Anderson Silva defeated Chael Sonnen with a triangle choke [J2]. A triangle choke is a choke often used in combat submission sports which stops circulation to the brain. This choke uses one's legs to form a triangle shape [J6]. The UFC ring is an octagon (8 sides), so a triangle has 5 less sides than it [J1].

Why is it Interesting?
Triangle chokes are common finishes in UFC matches. Submission techniques are important in UFC and the triangle choke is one of the most popular. Many popular fights have one of the fighters using this technique. This technique can also be used to save one from an assault in real life [J5].

Why is it Pyramidal?
The first three sentence order are fights that are finished with a triangle choke ordered from least to most popular. Women's UFC fights aren't watched as much as mens which is why the first sentence is about the women's league. Feruson's match is pretty popular but not as popular as Silva, as Silva is one of the most prominent fighters in UFC history. The fourth sentence is the easiest as it literally gives you the shape of the choke, and only the triangle choke is the only choke that is named after a triangle.

Why is it Hard (for computers)?
This question uses a common-link technique in which the system must guess what is common between the fighters/matches listed in the question. Because of this some systems struggle to find this and don't really answer because there isn't enough information given [A16]. There is also some basic math/geometry involved in the question combined with multi-hop, where systems may struggle to connect the dots. The system must know what ring is used in UFC, how many sides the ring has, and then subtract those sides with a number to get another shape that is formed by the move. This is fairly easy for humans to do if they know what the UFC ring is, but not for some systems [A9].

QA System Answers
Chat-GPT: guillotine choke (pyramidal), D'arce Choke (OQL)
Bing: D'arce Choke (pyramidal), D'arce Choke (OQL)

Q2 (Kyūdō)

Pyramidal: There is a traditional martial art sport known in the Eastern world and uses this official set of techniques. Contestants are scored by the quantity of hits, as well as the accuracy from their standing distance of approximately 200 feet from their objective. The sport first emerged in the late 1100's, and gained traction once more during the 1900's. This sport remains popular, and is often depicted in popular anime such as "Kaguya-sama: Love Is War." While wearing gloves, the contestant launches arrows towards their target using which set of official techniques with their equipment?

OQL: This traditional East Asian sport consists of contestants launching arrows at a target approximately 200 feet away using which set of official techniques with their equipment?

Answer: Shaho Hassetsu / Hassetsu

Explaining the Answer

The question starts with a traditional martial art from the Eastern world. This hints the topic at being about an old sport in Eurasia [J18]. Furthermore, the method of scoring points by standing approximately 200 feet from their objective should indicate some sort of shooting sport [J19]. The sport's date of origin and popularity increase should hint towards the sport of Kyūdō. The Japanese sport of Kyūdō consists of contestants shooting arrows from a longbow while using the formal techniques which All Nippon Kyudo Federation (ANKF) dubbed as the Shaho Hassetsu (Hassetsu) [J17].

Why is it Interesting?

This is interesting because the typical martial arts consists of your typical physical contact sport. Kyūdō on the other hand is the sport of archery to test one's patience and focus, as shooting targets from a longbow at 60 meters is not easy to accomplish [J19]. Furthermore, this sport, although a traditional one, still remains quite popular to this day in Japan.

Why is it Pyramidal?

As previously mentioned, one has to build connections from the clues given. The common sense of the sport being traditional and from the East indicates an old Eurasian sport [J18]. Furthermore, the description of the sport and scoring should indicate some form of archery or shooting. Those hints, tied with the origin of the sport and the fact that depictions of the sport are found in "popular anime," which is Japanese entertainment, should allow you to understand that the sport mentioned is Kyūdō. Lastly, the question asks about the techniques used in the sport, which were officially dubbed by the All Nippon Kyudo Federation (ANKF) as Shaho Hassetsu [J17].

Why is it Hard (for computers)?

This is hard for computers since all of the previous hints and connections are used to identify the sport. However, common sense is needed to both parse together the connections between the description of the sport and the idea of "anime" being Japanese [A7]. This only gets you the sport however, when then you need knowledge of in order to answer the question about the sport, which ChatGPT fails to do so as the system gets hung up on the name and details of the sport [A8]. Thus, rather than answering the question, ChatGPT simply describes the ideas.

QA System Answers

Chat-GPT: Kyūdō (Pyramidal) – shooting form/shooting style (OQL)

Bing: Kyūdō (Pyramidal)

Q3 (ESports – League)

Pyramidal: This organization participates in many online tournaments. The esports organization also is currently a team representing North America in the 2023 Mid-Season Invitational. Furthermore, this organization has a number in its name. An Attack-Damage Carry (ADC) player, who was also a popular cosplayer, left the organization's League of Legends roster in 2020, resulting in a saying due to the team's inability to make it to the 2020 World Championship. Moreover, the organization's team in the League Championship Series (LCS) 2023 Spring Season also won first place. Which organization is this?

OQL: This esports organization represents North America in the 2023 Mid-Season Invitational, and had a popular Attack-Damage Carry (ADC) player who left the League of Legends roster in 2020. Name the organization whose team in the League Championship Series (LCS) 2023 Spring Season won first place.

Answer: Cloud9

Explaining the Answer

Cloud9 is an esports organization which currently has a League of Legends team that is partaking in the 2023 Mid-Season Invitational (MSI) [J21]. The organization quite literally has a number in its name, and Sneaky is the ADC player and cosplayer who left the roster in 2020, resulting in the saying "No Sneaky No Worlds" [J23]. This saying was popularized due to the team's inability to make it to the international World Championship during 2020 after Sneaky's leave. Lastly, Cloud9 took first place in the spring season of the League Championship Series, which is the North American League of Legends regional tournament [J20].

Why is it Interesting?

This is interesting because Cloud9 is an esports organization which has been around for many years, and is famous for winning many tournaments with their teams. I chose to particularly talk about the League of Legends esports team for Cloud9 due to the popularity of both the game itself, as well as the team within the League of Legends community. Lastly, Cloud9 won the most recent regional League of Legends tournament in North America, and is now partaking in an international tournament (MSI)

[J20]. MSI is currently an ongoing tournament [J21].

Why is it Pyramidal?

The question is pyramidal since the first clue is that the answer is an esports organization based on participating in online tournaments. The next hints narrow the possible organizations, as there are two teams representing North America in MSI [J21]. Technically, if the guesser knows this, the next hint of having a number in the organization's name is already enough to narrow the choice down to Cloud9 since Golden Guardians does not have a number in their organization [J21]. However, the next hints probe at Sneaky, an ADC player and cosplayer who left Cloud9. This is another possible hint to lead to Cloud9, as his leave in early 2020 resulted in the team's inability to make it to the international World Championship for League of Legends [J23]. Lastly, Cloud9 won the recent spring split of the League Championship Series in North America, taking first place [J20]. This is the biggest hint since they were the winners of the most recent esports competitive event.

Why is it Hard (for computers)?

This question is hard for computers since most of the events in question are recent and ongoing tournaments [A17]. Furthermore, adding the hint that the organization has a number is misdirection in terms of tricking computers to focus on other teams with numbers, rather than Cloud9. For example, Chat-GPT answered with 100 Thieves (100T) since the organization has a number. Furthermore, multihop was used when asking about the ADC player who left Cloud9 (Sneaky) and the phrase "No Sneaky No Worlds" which resulted from his leave [A5]. The connection between the leaving of Sneaky to the saying, although possible to be made by computers, is not as easy. There would need to be an information hop from Sneaky's leave, to the phrase, and back to the organization in which Sneaky left.

QA System Answers

    Chat-GPT: 100 Thieves (Pyramidal / OQL)
    Bing: 100 Thieves (Pyramidal / OQL)

Q4 (Hockey)

Pyramidal: This sport is a very popular sport where teams have to score points against each other in a large rectangular arena. One of the largest tournaments of this sport was created by a person who shares a name with the man who developed a film known for its philosophical themes about the nature of humanity. A rapper, who is known for his association with a substance that consists of a principal component of a mouth spray that can alleviate symptoms of multiple sclerosis, wants to build a youth program in this sport. Participants in this sport wear a helmet that has a hard outer shell and a visor to protect their face. They are also prone to physical injuries. What is this sport?

OQL: A rapper, who is known for his association with a substance that consists of a principal component of a mouth spray that can alleviate symptoms of multiple sclerosis, built a youth program in this sport. What is this sport?

Answer: Ice Hockey

Explaining the Answer

Ice hockey is one of the most popular sports in North America and is even somewhat popular in Europe as well [J7]. An ice hockey rink is long and rectangular in shape, although it does have rounded ends. One of the largest ice hockey tournaments is the Stanley Cup. It began in 1888 by Lord Stanley of Preston [J8], who shares a name with Stanley Kubrick who produced the film "2001: A Space Odyssey". The Rapper in the question is Snoop Dogg. He is known for smoking marijuana. A principal component of marijuana is THC or tetrahydrocannabinol [J9]. THC is also a component of Nabiximols. Snoop Dogg has plans to create a youth hockey league [J11].

Why is it Interesting?

The question includes hints that contain information from many different categories. From the sport itself, to music and film. Ice Hockey is so popular that it is the national sport of Canada. Like American football and soccer, hockey also plays a part in national and regional identity.

Why is it Pyramidal?

The first hint tells that the answer is a sport and gives a vague range of what that sport could be by saying it takes place in a rectangular arena. The next couple of hints give hints that pertain to ice hockey but do not directly talk about the sports. Instead the hints talk about music or film in connection to sports. The last couple of hints talk about the sport directly. The difficulty in the hints goes from hard to easiest or hardest to relate to easiest to relate.

Why is it Hard (for computers)?

The question utilizes multi-hop in order to trick the computer. The question requires the computer to piece together information about the composition of the treatment of multiple sclerosis and rappers that may use the substance that the component can create. The question also asks about a connection between the film industry and the sports industry. The question also attempts to fool the computer into guessing other contact sports as the helmet and injuries of hockey are very similar to those found in sports like American football.

QA System Answers
>**Chat-GPT**: American Football
>**Bing**: lacrosse

Q5 (Water)

Pyramidal: A sport was recently inducted into a Hall of Fame of the U.S. state with only 1 Summer Olympic qualifier in a water sport. The sport is an annual summer event requires competitors to build their own vehicle. What is the event?

OQL: What is the annual summer event water sport, which requires competitors to build their own vehicle, that was inducted into the Hall of Fame in 2020 of the U.S. state with 1 Summer Olympic qualifier in another water sport?

Answer: Yukon 800 marathon

Bing: Kinetic Grand Championship (Pyramidal) | Cardboard Boat Regatta (OQL)

Explaining the Answer

The Yukon 800 marathon is a sport that takes place in Alaska every June. It is a sport where competitors build their own speedboat and race in the water [J22]. The sport was inducted into the Alaska Sports Hall of Fame in 2020 [J24]. Alaska to date has only had 1 person qualify for a Summer Olympic sport having to do with water. Her name is Lydia Jacoby [J25].

Why is it Interesting?

It is interesting because Alaska is a state with a different culture than the rest of the U.S. because it is detached from the mainland. They have their own sports that not many people know about and it is also interesting to see a sport having to do with engineering.

Why is it Pyramidal?

This question is pyramidal because there are many sports that are in Hall of Fames all over the U.S. It becomes more specific by saying that the state that the Hall of Fame belongs to is the one with 1 Summer Olympic water sport qualifier. Then, it becomes extremely specific by the question describing the sport.

Why is it Hard (for computers)?

This might be difficult for computers because this sport is very niche. Along with that, this question utilizes connections to make different parts of the the questions into answers. It makes the computer divert its attention to capture other parts and putting it all together can be difficult. This is called Multi-hop [A3].

QA System Answers

    Chat-GPT: Red Bull Flugtag (Pyramidal) | Red Bull Flugtag (OQL)

Misc

Q1 (Bossaball) - Sports

Pyramidal: There is a sport that is associated with jumping and was first introduced in a country that consists of many states and its federal district. The game's namesake comes from a music style that a Brazilian man who collaborated with a singer who was inspired by Bing Crosby in 1967 popularized. The referee is also named after the music style that is the super genre of the previously mentioned style. The game was conceptualized the same year that the Olympics occurred in the city that Shakespeare's, *A Midsummer Night's Dream* took place in . What is this sport?

OQL: This sport is associated with jumping and is named after the music style that can often be heard in the country it was first introduced in. What is this sport?

Answer: Bossaball

Explaining the Answer

Bossaball is a combination of volleyball, soccer, and different gymnastics skills. It was first introduced in the country of Brazil, which consists of a union of 26 different states and its own federal district [J12]. The name bossaball comes from the Bossa Nova music style which Antônio Carlos Jobim, who collaborated with Frank Sinatra in 1967, popularized the genre [J13]. Frank Sinatra was greatly influenced by the vocal style of Bing Crosby. The referee of bossaball is called the samba referee, which is a super genre of bossa nova [J14]. The game was introduced in the year 2004 which was the same year that the Olympics took place in Athens, which is the place where *A Midsummer Night's Dream* takes place [J15].

Why is it Interesting?

Bossaball is a relatively new sport compared to other more well known sports. Despite being new, it has been introduced to many countries in Europe, Africa, and South America like Argentina, Egypt, and Venezuela. There have even been international tournaments throughout the years and it was even present at the 2022 Qatar World Cup [J16]

Why is it Pyramidal?

The first sentence gives the guesser that the answer is a sport and gives some information about the history of the sport. It does not fit specifically to bossaball itself since the country could also be the United States where sports like basketball originated. The next hint gives information about a major aspect of bossaball which is the musical aspect. Close afterwards, more information about the sport is given. Since the name of the referee for this game is not just "referee", the hint giving the name of it provides a lot of information that could give the answer. Lastly, information about the creation of the sport was given.

Why is it Hard (for computers)?

The question employs the use of logic in order to confuse the computer. A sport that is associated with jumping could be any number of sports but narrowing down the country that it originated in would help a lot. However, in this case a country that consists of many states and its federal district could be a couple of answers. COmbining this with the previous hint, it could be easy to mix up the sport with something like basketball, which is what Chat-GPT returned when given only this sentence.

QA System Answers
Chat-GPT: Capoeira
Bing: Capoeira

Q2 (osu!) – Lifestyle (Games) [WIP]
Pyramidal: This is a popular online game which has both singleplayer and multiplayer capabilities. This game has had many official esports events, where international teams participate in a four versus four player competitive game. The longest standing top player has held their position for over two years, and caused the previous top player to lose their rank in 2021. What is the name of the game which is associated with the number of 727, which is the number of a content creator's performance rating in the game?

OQL: This popular online game is associated with the performance rating number, 727, and has official esports where international teams have players compete in a four versus four game. Which game has a top player which currently holds the longest reign of the position as of May 17th, 2023?

Answer: osu!

Explaining the Answer

Osu! is an online rhythm game which has both singleplayer, as well as multiplayer capabilities [K8]. The official esports event in question is the osu! World Cup, where international teams have four players on each team compete against each other on the various tournament-picked maps [K7]. This official esports event is held annually, and started in 2011. Furthermore, osu!'s current top player is a player named "mrekk," an Australian who has been in first place for over two years. Mrekk overtook the previous top player, "WhiteCat," in 2021 [K6]. Lastly, 727 is associated with the phrase, "when you see it," which is a reference to "Cookiezi" and his completion on the map "Blue Zenith" which was worth 727 performance points (pp) [K9]. Thus, osu! is the game in question as a result of all of the hints.

Why is it Interesting?

This is interesting because the rhythm game community is relatively small compared to other communities on the internet. Having this question about osu! hopefully sheds some light on the somewhat popular, but rarely talked about game. Furthermore, the United States competitive team for osu! has won five years in a row, and the next tournament is this fall [K7]. Also, the current top player "mrekk" still continues to hold the top rank, and has created a large gap in performance points between the second rank player [K6]. The

community goes as far as dubbing this "a new era" for osu! and the rhythm game community, as "mrekk" has set numerous records for top scores in the game, achieving what many players thought was impossible.

Why is it Pyramidal?

The question is pyramidal since the broad category is an online game with singleplayer and multiplayer. This is the broadest category, as thousands of games fit this. The next hint about official esports events lowers the possibilities down, but still is very ambiguous [K7]. Furthermore, the clue about the longest standing top player since 2021 should lower the possibilities of possible games even further. This clue also hints that there is a ranking system between players and their performance [K6]. Lastly, the reference to 727 is popular within the osu! community, as most osu! players know the reference due to its popularity and usage [K9]. Similar to the last hint, this hint also entails that there is a system for rating a player's performance, and the player obtained 727.

Why is it Hard (for computers)?

The question is hard for Chat-GPT and Bing AI due to its initial broad descriptions, which require the use of multihop to parse together the start and end of the overall question [A5]. The need to go from an online game with an esports tournament, to a game whose top player reigns the longest since 2021, as well as figuring out what the meaning of 727 is, all coincide to confuse Chat-GPT and Bing AI into guessing incorrectly. Furthermore, there is a need for logical reasoning to analyze the various hints about what "performance rating" entails and that a rating system exists for players [A7].

QA System Answers
> **Chat-GPT**: Brawlhalla (Pyramidal) / Splatoon 2 (sometimes OSU! – OQL)
> **Bing**: Tom Clancy's Rainbow Six Siege (Pyramidal) / Splatoon 2 (OQL)

Q3 (Genshin Impact) - Lifestyle (Games)

Pyramidal: There is an open-world game made by a well-known company from the most populous country in the world. This company is well known for releasing a worldwide sensation using an anime art style and the most well known game made by them is their open world action role-playing game, where the story revolves around a traveler who was separated from their sibling. One of the NPCs sells buns filled with meat and her name is an obvious nod to the folktale where a couple hunts and butchers humans to make into meat buns to serve to the public. Who is the NPC in the game?

OQL: The open-world game released by a well-known Chinese company is about a traveler who was separated from their sibling in the world of Teyvat. Who is the NPC, whose name is an obvious nod to the folktale where a couple hunts and butchers humans to make into meat buns to serve to the public, that sells meat buns?

Answer: Su Er'niang

Explaining the Answer

Su Er'niang is an NPC in the town of Liyue in the world of Teyvat in the game Genshin Impact made by a Chinese gaming company called Mihoyo [K1]. She stands by her cart and sells an in-game food called Mora Meat which is a meat bun. Her name is an obvious nod to a character in Chinese folklore called Sun Erniang [K1]. In the novel Water Margin, Sun Erniang and her husband hunt and butcher humans and cook them up and make meat buns out of them [K2]. This implies to the people that know this folklore that Su' Erniang's meat buns are actually made of human meat.

Why is it Interesting?

This is interesting because references in games are not often recognized as much and much less when they have to do with ancient folklore. This reference brings a bigger depth into the game, the different cities in the game and each of their culture's derived country. In this game, the country of derivation of the city Liyue is China. There are other regions of other characters, but it's interesting and enlightening to see the amount of effort put into the small parts like Easter eggs.

Why is it Pyramidal?

This is Pyramidal because is starts broad by mentioning an open-world game. Then it becomes slightly more specific when mentioning the most populous country in the world because it would specify only 1 country. Then, it describes the game in question and its plot which specifies the game itself. Then it gets even narrower by describing a specific character and then referencing the fact that it is connected to a Chinese folklore character both of whom sell meat buns.

Why is it Hard (for computers)?

For this, the question was focused on Chinese culture and since the dataset is more focused on English speaking cultures, it could be considered difficult because of the language barrier and therefore it could miss the language connection like puns [A2]. These models could probably have more information on other European history and folklore and not Asian cultures. Adding on to that, NPC's are not usually a part of games that people know in-depth about.

QA System Answers

Chat-GPT: Granny Shen (Pyramidal) | Xiangling (OQL)

Bing: Xiangling (Pyramidal) | Xiangling (OQL)

Q4 (Double Eagle II) - History[DELETE ME IF COMPLETE]

Pyramidal: This vehicle was the one of the first to cross the body of water that is connected to the deepest point on earth. Another name for the vehicle that they rode in was the spirit of the biggest city in the state that is named after a location that is directly next to it. In that same state, there is an area where vehicles that can weigh more than 200 tons can be found, which has the same name as this vehicle. After a century's worth of attempts to cross the body of water, this flight took 137 hours to cross and finally land in a field of barley. What is the name of the vehicle?

OQL: This vehicle was the one of the first to cross the body of water that is connected to the deepest point on earth. What is the name of the vehicle?

Answer: Double Eagle II

Explaining the Answer

The body of water that the question is asking about is the Atlantic Ocean. The deepest point on earth is the Mariana Trench at about 12 thousand feet [E18]. It is indirectly connected to the Atlantic Ocean through the Panama Canal. Another name for the balloon is The Spirit of Albuquerque. Albuquerque is located in New Mexico which was named after the Aztec Valley of the Rio Grande River in Mexico [E19]. There is an airport in New Mexico that shares a name with the hot air balloon, Double Eagle II Airport. The total time for the balloon to cross the Atlantic and finally land in a barley field in France was a little more than 137 hours.

Why is it Interesting?

The Double Eagle II was a historic balloon and its trip across the ocean was a monumental event. The flight was even supposed to last longer as officials closed the Le Bourget Airport for the crew to land at, but the balloon was running out of ballast so they had to land earlier than expected [E20].

Why is it Pyramidal?

The first sentence gives the fact that the answer is some sort of vehicle and gives some relevant and yet misleading information at the same time about it. This is the most difficult part of the question as it may mislead guessers and their thoughts. The next couple of hints give more and more information about the balloon and what happened with it. This could eventually lead to the name of the balloon being guessed.

Why is it Hard (for computers)?

The question attempts to mislead the computer by using common sense. In the first sentence, by saying that the ocean that the balloon flew over is connected to the Mariana Trench, the computer would immediately think of the Pacific Ocean because the trench lies within the ocean. However, the Atlantic is also indirectly connected through the Panama Canal and as a result the computer is misled at the start and a wrong answer could be generated [A7].

QA System Answers
    Chat-GPT: Bathyscaphe Trieste II
    Bing: Double Eagle II

Q5 (Belgian-English Art)

Pyramidal: There was an event in the 1990's that caused mass casualties of 2 ethnicities in the country where the film "Rising from Ashes" took place. This country and event was also the one where a famous Belgian artist lost a relative of his. He is also known to be a designer. What was the first collaboration piece he made with an English-speaking artist?

OQL: A Belgian artist who lost his relative in a tragedy in the 1990's taking place in the country where "Rising from Ashes" took place is also known to be a designer. What was the first collaboration musical piece he made with an English-speaking artist?

Answer: "Alors on Danse" remix

Explaining the Answer

"Alors on Danse" was originally a solo piece by Stromae, but Kanye West remixed it and Stromae saw it as something new, innovative, and a collaboration piece and he invited West to share the stage with him in Coachella in 2015 [K3]. Stromae is a Beligian artist and designer and he lost his father in the Rwandan genocide in 1994 [K4]. Rwanda is the place where the film "Rising from Ashes" took place [K5].

Why is it Interesting?

This is interesting because international collaboration between artists at the time were rare and unforeseen. Stromae is also a well-renowned artist and his most notable song is where he sang about the absence of his father. This is also an instance where an artist didn't directly collaborate with the other, rather they reworked the other's work and the other welcomed it and called it a collaboration.

Why is it Pyramidal?

The question starts off mentioning a mass casualty in the 1990's which is very broad. Then it gets more specific into describing the Rwandan genocide by mentioning a film's location and the description of the event. This connects to a Belgian artist, which is also a broad category, and in fact there are a surprising number of people with Rwandan roots in Belgium. Stromae is only the most prominent. Then it gets into something very specific by asking what was the first collaboration with an English artist.

Why is it Hard (for computers)?

This could be difficult be it is utilizing the multi-hop method [A3] by asking about irrelevant characteristics of the questions for the computer to be able to derive the answer. In that path, the computer could get lost and focus on something else tangential to the main idea.

QA System Answers

Chat-GPT: There were no collaborations (Pyramidal) | Meltdown (OQL)

Bing: Meltdown (Pyramidal) | There were no collaborations (OQL)

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Adversarial QA Techniques

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