1. Definitions:
    a. Intelligence: A measure of a person's ability to both gain knowledge and apply it.
    b. Artificial Intelligence: A replica of human intelligence in machines or computers.
    c. Agent: An entity that can think and act within its environment.
    d. Rationality: A pattern of thinking and acting based on sound logic or reasoning.
    e. Logical Reasoning: A method that helps lead to a conclusion or thought based on applying knowledge or logic.
2. Who was Alan Turing and what were his contributions to computer science and artificial intelligence?
    a. Alan Turing was the inventor of the Turing test. It was used to test if computers or machines could actually be capable of thought or intelligence. A computer would pass the test if it was capable of fooling a person that it was another human being with some written dialogue in a chat box. The human participant could not see the computer, but they could ask it questions. The computer would then respond to those questions and try to convince the person it was human with those responses. With this test, Turing helped provide the basic components that many artificial intelligence programs use today; these components include the ability to communicate through human language, the ability to gain and maintain knowledge about its surroundings, the ability to respond to questions and provide new ideas, and the ability to adjust or learn from the data or knowledge it gains. While the test itself may not be completely determinant of a computer's intelligence, it did provide a foundation for AI and machine learning in the modern world.
3. Perform internet search to discover whether the following tasks can currently be solved by computers. Explain each case and cite your references.
    a. Playing a decent game of table tennis (Ping-Pong)
        i. Yes, a computer can do this. I found a video displaying a machine learning to play a decent game of table tennis through simulation and training.
        ii. "AI table tennis robot learned to play in just 90 minutes": https://www.youtube.com/watch?v=qAItxreKMOI&ab_channel=NewScientist
    b. Driving in Victorville, California.
        i. No, a computer can not do this. While self-driving cars are not fully a thing yet, the technology is always developing and learning to get closer to that goal. I found an article explaining if the task was possible or not. I also found an article of a car crash involving a Tesla in Victorville, California. I am uncertain if the cause of the crash was the self-driving computer, but it still highlights that the technology is still not fully effective at keeping the car and its passengers safe.

   ii. "Can a car Drive Itself": https://wonderopolis.org/wonder/can-a-car-drive-itself
   iii. "Driver of Tesla killed after slamming into semi-truck in Victorville": https://www.vvng.com/driver-of-tesla-killed-after-slamming-into-back-of-semi-truck-in-victorville/

c. Playing a decent game of bridge at a competitive level.
   i. Yes, a computer can do this task. I found an article explaining that an AI called NooK played and won against several highly-skilled players of the card game. The AI did not win all of its games, but it still beat many of the human players and won most of the sets. This is a great example of AI being extremely knowledgeable of a task while not being flawless at it.
   ii. "An artificial intelligence just beat 8 world champions at bridge": https://www.cbc.ca/radio/asithappens/as-it-happens-the-wednesday-edition-1.6402751/an-artificial-intelligence-just-beat-8-world-champions-at-bridge-1.6402861
d. Discovering and proving new mathematical theorems.
   i. Yes, a computer can do this. I found several articles explaining that the DeepMind AI was used by mathematicians to discover and prove a new mathematical theorem in 2021. This is a great example of a machine helping with large and complex tasks that humans may not be able to do.
   ii. "Mathematicians use DeepMind AI to create new methods in problem-solving": https://www.sydney.edu.au/news-opinion/news/2021/12/02/mathematicians-use-deepmind-ai-develop-new-methods-problem-solving-proofs-conjectures.html
e. Writing an intentionally funny story.
   i. No, a computer can not do this currently. While I could not find a computer telling a funny story, I did find an example of a robot telling jokes. An AI called Jon the Robot was used to tell jokes to an audience and respond to their reactions to the jokes. I did not laugh at any of the jokes personally, but it seemed that at least some people were entertained by Jon. Good thing comedy is subjective.
   ii. "Comedy by Jon the Robot": https://www.youtube.com/watch?v=UZN6rpGvJXQ&ab_channel=ACMSIGCHI
f. Giving competent legal advice in a specialized area of law.
   i. No, a computer cannot do this currently. This is a similar case to the self-driving car. While it is not possible now, AI is being developed and trained to help with legal matters. I found an article explaining how AI is

not perfect for this kind of task, but that it could change with more time and progress.

ii. "Can AI Give Competent Legal Advice in a Specialized Area of Law?": https://www.allaboutlaw.co.uk/law-careers/legal-technology/can-ai-give-competent-legal-advice-in-a-specialised-area-of-law

g. Translating spoken English into spoken French in real time.
   i. Yes, a computer can do this. I found an article explaining Machine Translation (MT) is being used and developed to translate many different languages in real time. I also found a video of someone using an AI to translate what they say in English to French in real time. While the AI was not perfect, it was able to translate a good amount of the English and change the speaker's mouth movement with the spoken words.
   ii. "Teaching AI to translate 100s of spoken and written languages in real time": https://ai.meta.com/blog/teaching-ai-to-translate-100s-of-spoken-and-written-languages-in-real-time/
   iii. "AI translated video English to French": https://www.youtube.com/watch?v=a418-ewV8Z0&ab_channel=King%27sAcademy
h. Performing a complex surgical operation.
   i. Yes, a computer can do this with assistance. While AI cannot perform complex operations by itself, I found examples of surgeons using it to assist them in these operations. This is called robotic surgery. That name is kind of misleading as it is not exactly done by a robot. Instead, it is assisted by a robot. However, this could be another case where things could change in the future given more development and testing of AI and machines.
i. Creating original art (e.g. painting, music, etc.)
   i. Yes, a computer can technically do this. There are several examples of AI that can create images and videos based on text prompts given to it. Some popular examples of an AI doing this task are Midjourney and InVideo, which is in this assignment. However, there is currently a heavy debate on the originality and validity of this art. In this example, AI uses different images and videos created by actual people to create its own stuff. However, this may be considered stealing to some extent; therefore, the art created by the AI may not be entirely original. However, AI still indeed has the ability to create images, paintings, and videos.
   ii. Midjourney: https://www.midjourney.com/home?callbackUrl=%2Fexplore

   iii. “If it wasn’t created by a human artist, is it still art?”: https://news.harvard.edu/gazette/story/2023/08/is-art-generated-by-artificial-intelligence-real-art/

4. Generate a novel video in your area of interest using **invideo AI**:
   a. I decided to generate a brief video on what the world would be like if dinosaurs were still alive today.
   b. Video: https://ai.invideo.io/watch/b1RN2olL4r-