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AI GROUP WORK ASSIGNMEN

**Section A**

Consider the following cloud computing trends for the year 2019/2020:

**I.)Common sense reasoning**

Common-sense reasoning is a field of artificial intelligence that aims to help computers understand and interact with people in a more naturally by finding ways to collect these assumptions and teach them to computers. Common Sense Reasoning has been most successful in the field of [natural language processing](http://en.wikipedia.org/wiki/Natural_language_processing) (NLP), though notable work has been done in other areas. This area of machine learning, with its strange name, is starting to quietly infiltrate different applications ranging from text understanding to processing and comprehending what’s in a photo.

Without common sense, it will be difficult to build adaptable and unsupervised NLP systems in an increasingly digital and mobile world. When we talk to each other and talk online, we try to be as interesting as possible and take advantage of new ways to express things. It’s important to create computers that can keep pace with us.

There’s more to it than one would think. If I asked you if a giraffe would fit in your office, you could answer the question quite easily despite the fact that in all probability you had never pictured a giraffe inhabiting your office, quietly munching on your focus while your favorite Pandora station plays in the background. This is a perfect example of you not just knowing about the world, but knowing how to apply your world knowledge to things you haven’t thought about before.

The power of common sense systems is that they are highly adaptive, adjusting to topics as varied as restaurant reviews, hiking boot surveys, and clinical trials, and doing so with speed and accuracy. This is because we understand new words from the context they are used in. We use common sense to make guesses at word meanings and then refine those guesses and we’ve built a system that works similarly. Additionally, when we understand complex or abstract concepts, it’s possible we do so by making an analogy to a simple concept, a theory described by George Lakoff in his book, “Metaphors We Live By.” The simple concepts are common sense.

There are two major schools of thought in common-sense reasoning. One side works with more logic-like or rule-based representations, while the other uses more associative and analogy-based reasoning or “language-based” common sense — the latter of which draws conclusions that are fuzzier but closer to the way that natural language works.

Whether you realize it or not, you interact with both of these kinds of systems on a daily basis.

You’ve probably heard of IBM’s [Watson](http://en.wikipedia.org/wiki/Watson_(computer)), which famously won at Jeopardy, but it’s a lesser-known fact that Watson’s predecessor was a project called [Cyc](http://en.wikipedia.org/wiki/Cyc) that was developed in 1984 by Doug Lenat. The makers of Cyc, called [Cycorp](http://www.crunchbase.com/organization/cycorp" \t "_blank), operate a large repository of logic-based common sense facts. It’s still active today and remains one of the largest logic-based common sense projects.

In the school of language-based common sense, the [Open Mind Common Sense](http://en.wikipedia.org/wiki/Open_Mind_Common_Sense) project was started in 1999 by Marvin Minsky, Push Singh, and myself. OMCS and ConceptNet, its more well-known offshoot, include an information store in plain text, as well as a large knowledge graph. The project became an early success in crowdsourcing, and now ConceptNet contains 17 million facts in many languages.

**Why Is It Important Now?**

The last few years have seen great steps forward in particular types of machine learning: [vector-based machine learning](http://en.wikipedia.org/wiki/Support_vector_machine) and [deep learning](http://en.wikipedia.org/wiki/Deep_learning). They have been instrumental in advancing language-based common sense, thus bringing computers one step closer to processing language the way humans do.

NLP is where common-sense reasoning excels, and the technology is starting to find its way into commercial products. Though there is still a long way to go, common-sense reasoning will continue to evolve rapidly in the coming years and the technology is stable enough to be in business use today. It holds significant advantages over existing ontology and rule-based systems, or systems based simply on machine learning.

It won’t be long before you have a more common-sense conversation with your computer about your trip to Mexico. And when you tell it that the water was a bit cold, your computer could reply: “I’m sorry to hear the ocean was chilly, it tends to be at this time of year. Though I saw the photos from your trip and it looks like you got to wear that lovely new bathing suit you bought last week.”

Section B:

**AI Applications In Education**

Not only is education being transformed as far as science, technology, engineering, and math (STEM) curricula, but the education industry as a whole is being transformed by AI. Educational institutions from elementary to higher education as well as adult and professional learning are being transformed by intelligent systems that are helping humans learn better and achieve their learning objectives.

One of the greatest challenges with regards to education is that people learn differently and at different rates. Students go through the education system with differing levels of learning ability and aptitude. Some are more adept at “left brain” thinking with skills for analytical thought, while others are more skilled at “right brain” thinking with creative, literary, and communicative ability. Others are challenged in different ways with physical and mental disabilities, or skill sets that differ from one region of the world to another, facing challenges in re-learning new languages and alphabets.

**AI-Enabled Hyper personalization**

[AI systems are being used to tailor and personalize learning for each individual student](https://www.cognilytica.com/2019/05/01/ai-today-podcast-87-ai-use-case-series-ai-in-education/). Through the power of machine learning based hyper personalization, AI systems are being used to develop a custom learning profile of each student and customize the training materials for each student based on their ability, preferred mode of learning, and experience.

Hyper personalized and on demand digital content is also created with the help of AI and machine learning which is changing the way things are done in education. Big textbooks providers now have their information broken down or condensed into smaller study guides, chapter summaries, flashcards, as well as short smart notes for better reading and understanding. Learning is therefore getting paperless with time and soon there will be less or no use of hard copy textbooks for learning. AI systems also have an online interactive interface which aids in feedback from the students to their professors for follow up purposes in areas where they might be struggling or have not yet fully grasped.

In addition to customized materials, AI systems are being used to augment tutoring with personal, conversational education assistants. These autonomous conversational agents can answer questions from students, provide assistance with learning or assignment tasks, and reinforce concepts with additional materials that can help reinforce the curriculum. These intelligent assistants are also enhancing adaptive learning features so that each of the students can learn at their own pace or time frames [Arizona State University gives many of its incoming college freshmen an Amazon Alexa](https://www.cognilytica.com/2018/08/29/ai-today-podcast-052-ai-on-the-campus-interview-with-john-rome-arizona-state-university/) as a way to give them much more timely and focused information about their campus needs. These voice assistants can help answer common questions about campus needs as well as be customized for each student’s particular schedule and courses. This greatly reduces the need for internal support and decreases the cost of wasteful college handbook printing that can quickly get out-of-date. The use of voice assistant systems is very much exciting and interesting to most students and is expected to gain broader adoption in the coming years.

**Adoption of voice assistants**

In addition, educators are making increased use of voice assistants in the classroom environment. Voice assistants such as Amazon Alexa, Google Home, Apple Siri, and Microsoft Cortana are giving students a chance to interact with educational material without the interaction of the teacher. These devices can be used at home or similar non-educational environment to provide conversational interaction with teaching material and additional educational assistance.

In the higher education environment, universities and colleges are giving students voice assistants instead of the traditionally printed student handbooks or hard-to-navigate websites for help with a number of campus-related informational needs.

**Assisting educators with organizational tasks**

In addition to education-oriented duties, teachers are also faced with having to manage the classroom environment and handle various organizational tasks. Educators are often required to handle many non-teaching responsibilities such as essay evaluation, grading of exams, filing necessary paperwork, HR and personnel related issues, ordering and managing classroom materials, booking and managing field trips, responding to parents, assisting with conversation and second-language related issues, dealing with sick or otherwise absent students, and otherwise facilitating the learning environment. Educators often spend up to 50% of their time on non-teaching tasks. AI systems are particularly helpful at managing these back office and task related activities. These AI systems can assist with grading activities and provide personalized responses to students. They can also handle routine and repetitive paperwork, deal with logistics related matters, and other personnel issues. AI systems can even provide a first-line interaction with parents and guardians and give access to resources or provide feedback as needed for routine matters giving teachers more time to focus on things that require a personal touch with the students.

[Education administrators are also reaping the benefits of AI](https://www.cognilytica.com/2019/03/28/infographic-ai-in-education/) with administrative tasks by using intelligent assistants to help with a range of administrative needs including budgeting, student applications and enrollment, course management, educator HR related issues, purchasing and procurement activities, expense management, and facilities management. Using intelligent AI-powered systems can greatly improve the efficiency of many educational institutions, lower their operating costs, give them greater visibility into income and expenses, and improve the overall responsiveness of the educational institutions.

On the higher education side, college admissions officials are looking at using AI systems to improve the fairness and quality of the admissions process. AI systems that are trained in a way that eliminates much of the human bias are starting to be used to provide a credible and fair admission using a given criteria when compared to humans. Recent college admissions scandals have increased oversight and governance on admissions processes, and the use of machine learning systems to provide a more systematic way of handling admissions is proving to be fruitful.

In the not too distant future, you can expect that AI and machine learning will be a core part of all educational experiences. AI is starting to show its benefits and application to a wide range of educational needs, and the hope is that it will greatly improve overall learning outcomes for all.

**Examples of ways in which AI is being pioneered and applied in education**. While the applications included are in use in some form today, one could argue that most are still in a relatively “primitive” stage in terms of envisioned long-term objectives.

Specifically, we explore:

* **Smart Content –**Technology that attempts to condense text books into useful tool for exam preparation such as true or false questions. “Smart content” creation, from digitized guides of textbooks to customizable learning digital interfaces, are being introduced at all levels, from elementary to post-secondary to corporate environments.
* **Intelligent Tutoring Systems** (ITS)– Personalized electronic tutoring customized to the learning styles and preferences of the pupil
* **Virtual Facilitators and Learning Environments –**Virtual human guides and facilitators for use in a variety of educational and therapeutic environments. . Though not yet a reality, the ultimate goal in this field is to [create virtual human-like characters](http://www.aaai.org/ojs/index.php/aimagazine/article/view/2487/2386) who can think, act, react, and interact in a natural way, responding to and using both verbal and nonverbal communication.

Out of those provided, intelligent tutoring systems (ITS) seem to have made the most progress over the last 20 years, as one of the original concepts for applications of AI in education. All have the potential to help shape a next generation of more personalized learning and responsive teaching.

Examples of ways in which AI is being pioneered and applied in education Source: <https://emerj.com/ai-sector-overviews/examples-of-artificial-intelligence-in-education/>

AI Applications In Education <https://www.forbes.com/sites/cognitiveworld/2019/07/12/ai-applications-in-education/#5bb7c72362a3>