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HLT HW 7
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Percy: The Chatbot

Report and Evaluation

Introduction

Ancient Greece gave birth to many contributions that have remained integral to human society thousands of years later. Alexander the Great and his military strategies, Euclid, Archimedes, Pythagoras and their mathematics, Aristotle and Plato and their contributions to philosophy, democracy all originate in Greece. Along with these famous warriors, mathematics and philosophers, Greece would give birth to some of the greatest storytellers of human history. It would be the likes of Hesiod and Homer that would tell the tales of great warriors, monsters, and gods that once ruled the world. These stories play an important role throughout human society today as the mythology born in the minds of Hesiod and Homer can be seen referenced in modern science, arts, literature and language. The problem when someone attempts to learn about Greek mythology is the vastness of it. There are 12 main Olympians gods, titans and giants. Along with the theme there are hundreds of minor gods and other immortals, thousands of monsters, demigods, kings and queens and much more. It can be difficult when trying to learn specific information about everything in Greek mythology. This is where our chatbot, Percy, comes in.

We developed Percy, a chatbot, which is a computer program or artificial intelligence (AI) that conducts conversation via auditory or textual methods, for specific information retrieval on Greek mythology. The chat bot is aided by a knowledge base where it draws information on the many Gods, Goddesses, and Monsters of Greek mythology, and any gap in knowledge from the knowledge base is filled with the chatbot's ability to retrieve information through the largest encyclopedia on the internet, Wikipedia.

Chatbots can be divided into two different categories: rule based chatbots and self-learning chatbots. Rule-based chatbots have a set of simple rules that they are trained on and can answer questions based on this set of predefined rules.

Self-learning chatbots are able to utilize artificial intelligence and machine learning to answer questions, which makes them more versatile for certain situations.

Chatbots can be further divided in two more categories based on how they generate their information. There are retrieval bots, which get their information from a set of predefined responses, and generative based chatbots, which are trained on previous conversations, and are able to generate responses based on that. Generative is more of a “realistic” conversation flow. For our purposes we did a simple rule and retrieval based chatbot. Building a chatbot that is self-learning and generative would be overkill for the scope of this project. We needed a system that could answer simple user questions from a finite source of information on Greek Mythology, utilizing self-learning and generative chatbots for this would be over-engineering the bot. Our rule and retrieval based chatbot is aided with the powerful Natural Language Toolkit (NLTK) library for text processing.

Techniques from Class

The Natural Language Toolkit (NLTK), is an open source python library that performs natural language processing functions such as lemmatization and tokenization. The issue with processing large amounts of data from the knowledge base is that it is not formatted uniformly. In order to make sure that bot is able to process the information effectively we need a way of converting the data to a

structured format. We preprocess the text in the following way: lowercase the text so that the data is not case

sensitive, the strings are then tokenized, non-ascii characters are removed, and the tokens are lemmatized. We lemmatized instead of stemming because stemming can create some non-exists words. We also implemented part of speech tagging within pre-processing.

```
def remove_non_ascii(words):
    """Remove non-ASCII characters from list of tokenized words"""
    new_words = []
    for word in words:
        new_word = unicodedata.normalize('NFKD', word).encode('ascii', 'ignore').decode('utf-8', 'ignore')
        new_words.append(new_word)
    return new_words

def processText(raw_text):
    """ process the raw text of the knowledge base by:
        - removing punctuation and digits
        - tokenizing the processed text
        - removing non-ascii characters from the tokens
        - applying POS tagging and lemmatization
        and returns the list of lemmas
    """
    text = re.sub(r'[\<>{}.\?!,:;()\-\n\d]', ' ', raw_text.lower())
    word_token = word_tokenize(text)
    clean_text = remove_non_ascii(word_token)

    # pos tagging and lemmatization
    tag_map = defaultdict(lambda: wn.NOUN)
    tag_map['J'] = wn.ADJ
    tag_map['V'] = wn.VERB
    tag_map['R'] = wn.ADV
    lemmatizer = WordNetLemmatizer()
    lemma_list = []
    clean_text = [i for i in clean_text if i]
    for token, tag in nltk.pos_tag(clean_text):
        lemma = lemmatizer.lemmatize(token, tag_map[tag[0]])
        lemma_list.append(lemma)

    return lemma_list
```

This pre-processing function was based on the GitHub code example with some modifications.

```

def preprocess(raw_text):
    """
    Preprocess raw tex.
    Arguments: a raw text string
    Output:
        text - raw_text with punctuation and numbers removed, lower cased
        tokens - tokens
        stemmed - stemmed words
        lemmas - lemmas
        content - tokens with stop words removed
    """

    # remove punctuation and numbers with a regular expression
    text = re.sub(r'[.?!,:;()\-\n\d]', ' ', raw_text.lower())

    # tokenizing extracts words, not white space
    tokens = word_tokenize(text)

    # stemming removes affixes from words.
    stemmer = PorterStemmer()
    stemmed = [stemmer.stem(t) for t in tokens]

    # lemmatization finds the root words
    wnl = WordNetLemmatizer()
    lemmas = [wnl.lemmatize(t) for t in tokens]

    # removing stopwords
    stop_words = set(stopwords.words('english'))
    content = [t for t in tokens if not t in stop_words]
    return text, tokens, stemmed, lemmas, content

```

Alongside the NLP techniques we used, we also implemented machine learning techniques such as TF-IDF vectorization and cosine similarity.

In a knowledge base this big there will be words that dominate the document, but they do not provide any useful information. TF-IDF ranks words based on how often they appear in the document and penalizes the words that appear often. This is useful for removing words such as “the”, which can appear often but don’t have much useful information. The TF-IDF vectorizer gives us two real valued vectors in

vector space. This then allows us to calculate the cosine similarity, which allows us to find the similarity between the users questions and the knowledge in the knowledge base. This allows us to efficiently match and find the most relevant information to deliver to the user.

```
def botResponse(user_input):
    """ generates a response most similar to the users requests based on cosine similarity
        - if no content is found in the knowledge base, the wiki api is used to search wiki
    """

    #tfidf_vectorization_and_cosine_similarity
    sent_tokens.append(user_input)
    TfidfVector = TfidfVectorizer(tokenizer=processText, stop_words='english')
    tfidf = TfidfVector.fit_transform(sent_tokens)
    vals = cosine_similarity(tfidf[-1], tfidf)
    index = vals.argsort()[0][-2]
    flat = vals.flatten()
    flat.sort()
    req_tfidf = flat[-2]

    bot_response=''
    # can't understand user input or need to wiki search
    if(req_tfidf == 0) or "tell me about" in user_input:
        print("I'm thinking.....")
        if user_input:
            bot_response = search_wiki(user_input)
            return bot_response
    # found in knowledge base
    else:
        bot_response = bot_response+sent_tokens[index]
        responses = ["You just really know what questions to ask don't you!", "Hmm, let me see what I can find on that ",
                    "Great question!", "Oh wow, let me see what I can dig up for you ",
                    "Give me a second.. I need to think on that one."]
        print(random.choice(responses))
        return bot_response
```

The code in implementing the TFIDFVector as well as cosine_similarity was produced here after researching many implementations. Below is the implementation we followed:

```

robo_response=''
sent_tokens.append(user_response)
TfidfVec = TfidfVectorizer(tokenizer=Normalize, stop_words='english')
tfidf = TfidfVec.fit_transform(sent_tokens)
#vals = cosine_similarity(tfidf[-1], tfidf)
vals = linear_kernel(tfidf[-1], tfidf)
idx=vals.argsort()[0][-2]
flat = vals.flatten()
flat.sort()
req_tfidf = flat[-2]

```

Evaluations

Percy is designed to be super easy to use and understand. The bot gives you tips at the start on how to communicate with it properly. This makes it intuitive for the user to understand how to get the most out of the bot. The responses of the bot are not perfect. For instance asking the bot a “who is” question, makes the bot search the knowledge base for information. An example would be asking the bot “who is Zeus?”, the bot would then correctly return that “Zeus was recognized as the father of gods and humans”. However, asking the bot a “tell me about” question, makes the bot perform a search using the Wikipedia library. Here is where it sometimes is incorrect. Asking the bot “tell me about Zeus”, returns information on Jesus.

When the bot performs knowledge base questions it sometimes only will return the first line the keyword is found in the knowledge base as opposed to the entire answer. In addition, another issue is the difference in answers generated based on the user’s question. For example, when asked “who is Ares”, there is no relevant result. However, when asked “who is the god of war”, the bot responds with Ares. The system can be mainly improved in two ways. The first is solving the issues with the Wikipedia library searches. Instead of using the library, we could use the

Wikipedia API, which would give us more accurate results. The other way the system could be improved is by changing the bot into a generative bot. Currently, the way you ask a question can yield different results, if the bot can learn from past responses, this would resolve this issue.

From a brief survey, here are the strengths and weaknesses:

Strengths

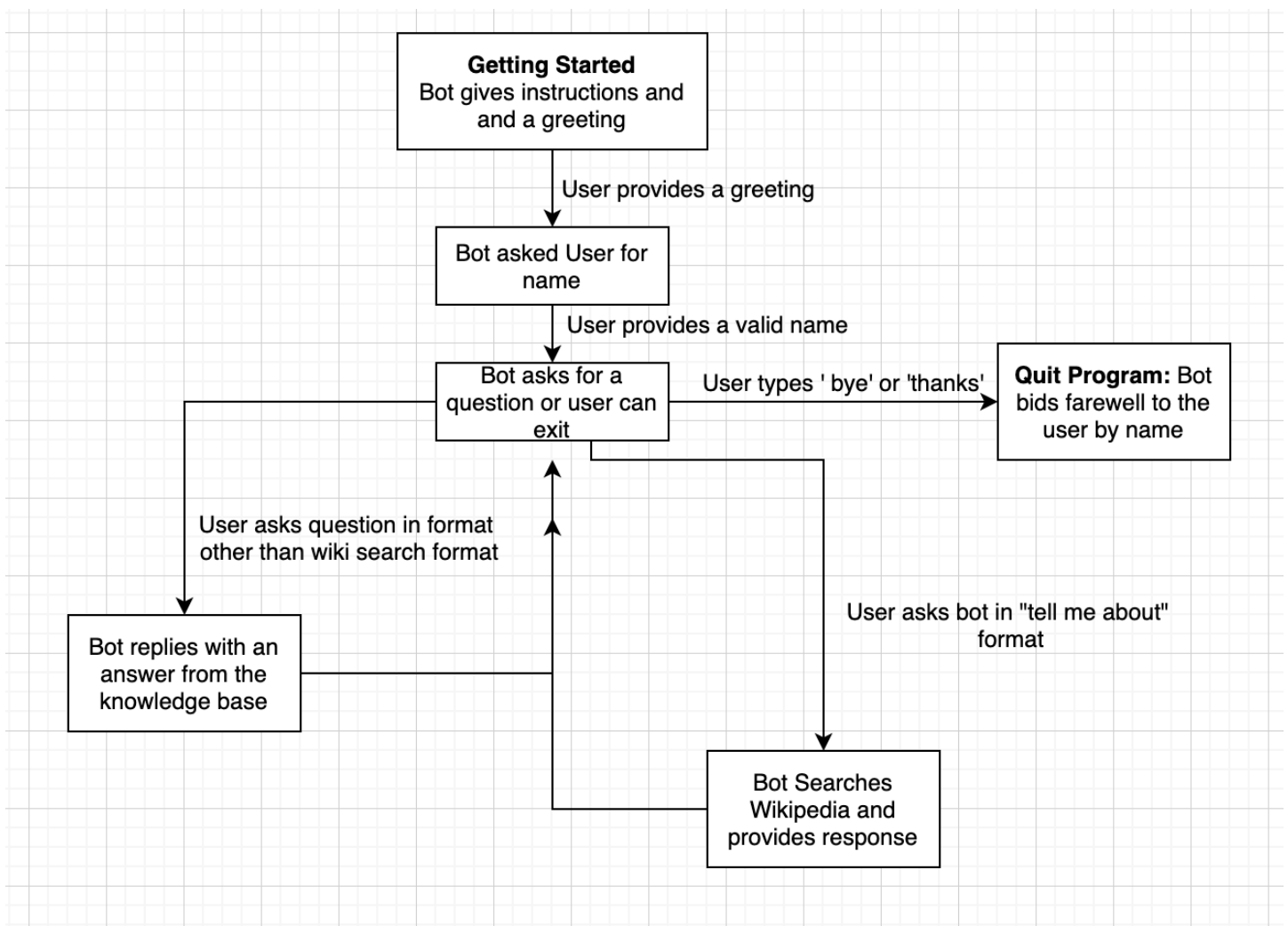
- Solid understanding and responses to questions with simple information on Greek Mythology
- The scope of the project can be expanded with the Wikipedia API, allowing the user to ask questions outside of the domain if they want to
- The bot is intuitive because of the instructions explained and “friendly” with its personalized commentary

Weaknesses

- Sometimes the first occurrence of a keyword is returned instead of the most relevant
- Certain questions are understood better when reworded (EX: Who is Ares vs Who is the god of war)
- The bot is not generative so the conversation relies on random occurrences of ready made replies

Dialog Logic

The logic presented here is a general idea of the flow of conversation/responses between the user and Percy. Percy responds to the user with the desired answers as well as a bit of personalized commentary which is chosen at random from some premade responses. To get a specific overview of every dialog response, there are some screenshots below:



```
responses = ["You just really know what questions to ask don't you!", "Hmm, let me see what I can find on that ",  
            "Great question!", "Oh wow, let me see what I can dig up for you ",  
            "Give me a second.. I need to think on that one."]
```

```
responses = ["Wow I've always wanted to learn more about ",  
            "Hmm, let me see what I can find ", "Here is what I found on ",  
            "This is information on ", "Oh wow, let me see what I can dig up ",  
            "I'm searching my brain for "]
```

Sample Dialog Interactions

```

Here are some tips:
Ask me questions about Greek Mythology like this: Who is the god of war?.....Who did Hera marry?... Who is the youngest god?
If you want to know more on a specific topic or aren't getting the answers you want, try asking me about the topic in this way: 'Tell me about ____'
If you want to exit, type Bye, or thanks!

Hi! My name is Percy and I'm a chatbot with data on Greek Gods and Goddesses. psst...say hi to me.. I like to feel acknowledged :)
hi
hi there
What is your name?
Shivani
Hi Shivani what would you like to ask me?
Who is Zeus
Percy: Give me a second.. I need to think on that one.
god zeus

zeus was recognized as the father of gods and humans.
who is the oldest god
Percy: You just really know what questions to ask don't you!
pan is considered to be one of the oldest greek gods and was especially beloved among the people.
who is the goddess of beauty
Percy: You just really know what questions to ask don't you!
aphrodite - goddess of love and beauty.
tell me about hercules
Percy: I'm thinking.....
Wow I've always wanted to learn more about hercules
Hercules () is the Roman equivalent of the Greek divine hero Heracles, son of Jupiter and the mortal Alcmene. In classical mythology, Hercules is famous for his strength
The Romans adapted the Greek hero's iconography and myths for their literature and art under the name Hercules. In later Western art and literature and in popular culture
Thanks
Percy: You are welcome Shivani.

```

The above diagram shows a brief introduction, responses from the knowledge base, and responses from the Wiki live look up. Below we will display a more detailed dialogue strictly from the knowledge base and live look up.

Interactions Strictly from Knowledge Base:

The diagram shows responses based on searches from the knowledge base.

```

Here are some tips:
Ask me questions about Greek Mythology like this: Who is the god of war?.....Who did Hera marry?... Who is the youngest god?
If you want to know more on a specific topic or aren't getting the answers you want, try asking me about the topic in this way: 'Tell me about ____'
If you want to exit, type Bye, or thanks!

Hi! My name is Percy and I'm a chatbot with data on Greek Gods and Goddesses. psst...say hi to me.. I like to feel acknowledged :)
hi
hey
What is your name?
shivani
Hi Shivani what would you like to ask me?
who is Hera
Percy: Hmm, let me see what I can find on that
goddess hera

goddess hera was the sister of zeus, daughter of the titans cronus and rhea, and at the same time zeus' wife.
who did hera marry
Percy: Hmm, let me see what I can find on that
hera - queen of the gods and married to zeus.
who is the oldest god
Percy: Give me a second.. I need to think on that one.
pan is considered to be one of the oldest greek gods and was especially beloved among the people.
who is the god of war
Percy: Hmm, let me see what I can find on that
ares - god of war.
what is a centaur
Percy: You just really know what questions to ask don't you!
these creatures may represent chaos and lack of reason, for example, the centaurs - half-man and half-horse.
who is the goddess of beauty
Percy: Oh wow, let me see what I can dig up for you
aphrodite - goddess of love and beauty.
thanks
Percy: You are welcome Shivani.

```

Interactions from Wiki (Live Look-Up)

```

Hi! My name is Percy and I'm a chatbot with data on Greek Gods and Goddesses. psst...say hi to me.. I like to feel acknowledged :)
hi
why hello there
What is your name?
Shivani
Hi Shivani what would you like to ask me?
tell me about ancient Greece
Percy: I'm thinking.....
Wow I've always wanted to learn more about ancient greece
Ancient Greece (Greek: Ἑλλάς, romanized: Hellás) was a civilization belonging to a period of Greek history from the Greek Dark Ages of the 12th-9th centuries BC to the e
tell me about Hercules
Percy: I'm thinking.....
Hmm, let me see what I can find hercules
Hercules () is the Roman equivalent of the Greek divine hero Heracles, son of Jupiter and the mortal Alcmena. In classical mythology, Hercules is famous for his strength
The Romans adapted the Greek hero's iconography and myths for their literature and art under the name Hercules. In later Western art and literature and in popular cultur
tell me about Hermes
Percy: I'm thinking.....
Here is what I found on hermes
Hmm there doesn't seem to be much on hermes
None
tell me about Hades
Percy: I'm thinking.....
Oh wow, let me see what I can dig up hades
Hmm there doesn't seem to be much on hades
None
tell me about Medusa
Percy: I'm thinking.....
This is information on medusa
In Greek mythology, Medusa (; Ancient Greek: Μέδουσα "guardian, protectress") also called Gorgo, was one of the three monstrous Gorgons, generally described as winged b
According to Hesiod and Aeschylus, she lived and died on an island named Serpedon, somewhere near Cisthene.
thank you
Percy: You are welcome Shivani.

```

The above diagram is an example of responses based off of the Wiki library.

Appendix of Knowledge Base

```

APOLLO - Olympian god of music, poetry, art, oracles, archery, plague, medicine, sun, light and knowledge.

ARES - God of war. Represented the physical, violent and untamed aspect of war.

ARISTAEUS - Minor patron god of animal husbandry, bee-keeping, and fruit trees. Son of Apollo.

ASCLEPIUS - God of medicine, health, healing, rejuvenation and physicians.

ATLAS - The Primordial Titan of Astronomy. Condemned by Zeus to carry the world on his back after the Titans lost the war.

ATTIS - A minor god of vegetation, fruits of the earth and rebirth.

BOREAS - A wind god (Anemoi) and Greek god of the cold north wind and the bringer of winter. Referred to as "The North Wind".

CAERUS - Minor god of opportunity, luck and favorable moments.

```

```

ChatBot x
Hi! My name is Percy and I'm a chatbot with data on Greek Gods and Goddesses. psst...say hi to me.. I like to feel acknowledged :)
*nod*
What is your name?
shivani
Hi Shivani what would you like to ask me?
who is attis
Percy: Hmm, let me see what I can find on that
attis - a minor god of vegetation, fruits of the earth and rebirth.

who is boreas
Percy: I'm thinking.....
None
Percy: You just really know what questions to ask don't you!
boreas - a wind god (anemoi) and greek god of the cold north wind and the bringer of winter.
who is castor
Percy: Oh wow, let me see what I can dig up for you
castor - one of the twins, castor and pollux, known as dioskouri.

```

This is a sample of how the chatbot is pulling information from the knowledge base to answer the user's questions. The snippet above shows the particular section of the knowledge base that corresponds to the output.

What's in the Knowledge Base?

The knowledge base consists of the text scraped from multiple websites with domain knowledge of Greek Mythology. Most of these websites listed the main Gods and Goddesses and their relationships and their region of influence. In addition to Gods and Goddesses, the knowledge base also contains information on monsters such as Satyrs, Medusa, or Centaurs. Here's a more organized list of contents of the knowledge base, followed by some more sample interactions:

- List of Gods and Goddesses and what they do
 - Hermes
 - Hades
 - Apollo
 - Athena
 - Castor

- Boreas
- Helios
- Zeus
- Uranus
- Aphrodite
- Hypnos
- Triton
- Poseidon
- etc.

Hi User what would you like to ask me?

who is Castor

Percy: Oh wow, let me see what I can dig up for you
castor - one of the twins, castor and pollux, known as dioskouri.

Who is the goddess of beauty

Percy: Oh wow, let me see what I can dig up for you
aphrodite - goddess of love and beauty.

who is the god of war

Percy: Give me a second.. I need to think on that one.
ares - god of war.

who is the god of oceans

Percy: Give me a second.. I need to think on that one.
oceanus
titan god of the ocean.

who's the god of sleep?

Percy: Oh wow, let me see what I can dig up for you
hypnos
the greek god of sleep.

Here's a more detailed look at some snippets of the knowledge base:

Achelous	The patron god of the "silver-swirling" Achelous River.
AEOLUS	- Greek god of the winds and air
AETHER	- Primordial god of the upper air, light, the atmosphere, space and heaven.
ALASTOR	- God of family feuds and avenger of evil deeds.
APOLLO	- Olympian god of music, poetry, art, oracles, archery, plague, medicine, sun, light and knowledge.
ARES	- God of war. Represented the physical, violent and untamed aspect of war.
ARISTAEUS	- Minor patron god of animal husbandry, bee-keeping, and fruit trees. Son of Apollo.
ASCLEPIUS	- God of medicine, health, healing, rejuvenation and physicians.
ATLAS	- The Primordial Titan of Astronomy. Condemned by Zeus to carry the world on his back after the Titans lost the war.
ATTIS	- A minor god of vegetation, fruits of the earth and rebirth.
BOREAS	- A wind god (Anemoi) and Greek god of the cold north wind and the bringer of winter. Referred to as "The North Wind".
CAERUS	- Minor god of opportunity, luck and favorable moments.
CASTOR	- One of the twins, Castor and Pollux, known as <u>Dioskouri</u> . Zeus transformed them into the constellation Gemini
CERUS	- The large and powerful wild bull tamed by Persephone and turned into the Taurus constellation.
CHAOS	- The nothingness that all else sprung from. A god who filled the gap between Heaven and Earth and created the first beings.
CHARON	- The Ferryman of Hades. Took the newly dead people across the rivers Styx and <u>Acheron</u> to the Greek underworld if they paid him.
CRONOS	- The god of time. Not to be confused with Cronus, the Titan father of Zeus.
CRIOS	- The Titan god of the heavenly constellations and the measure of the year..

Achilles	The warrior Achilles is one of the great heroes of Greek mythology. According to legend, Achilles was extraordinarily strong, courageous and loyal, but his heel was his only weakness.
Sparta	Sparta was a warrior society in ancient Greece that reached the height of its power after defeating rival city-state Athens in the Peloponnesian War.
Alexander the Great	Alexander the Great was an ancient Macedonian ruler and one of history's greatest military minds who, as King of Macedonia and Persia, established the largest empire the world had ever seen.
Hercules	Hercules (known in Greek as Heracles or Herakles) is one of the best-known heroes in Greek and Roman mythology. His life was not easy—he endured many hardships and performed twelve labors.
Trojan War	The story of the Trojan War—the Bronze Age conflict between the kingdoms of Troy and Mycenaean Greece—straddles the history and mythology of ancient Greece.
Aristotle	The Greek philosopher Aristotle (384–322 B.C.) made significant and lasting contributions to nearly every aspect of human knowledge, from logic to biology.
Sevens Wonders of the Ancient World	The amazing works of art and architecture known as the Seven Wonders of the Ancient World serve as a testament to the ingenuity, imagination and sheer power of ancient civilizations.
Greek mythology	Greek mythology is the body of myths originally told by the ancient Greeks, and a genre of Ancient Greek folklore. These stories concern the origin and growth of the world and its features, and especially the actions of the legendary figures and how they fit into the overall scheme of things.

The twelve Olympian gods were the major gods of the Greeks and lived on Mount Olympus. They included:

Zeus - Leader of the Olympians and god of the sky and lightning. His symbol is the lightning bolt.

Hera - Queen of the gods and married to Zeus. She is the goddess of marriage and family. Her symbols are the peacock, Poseidon - God of the ocean, earthquakes, and horses. His symbol is the trident.

Dionysus - Lord of wine and celebrations. Patron god of the theatre and art. His main symbol is the grapevine.

Apollo - Greek god of archery, music, light, and prophecy. His symbols include the sun, the bow and arrow, and the lyre.

Artemis - Goddess of the hunt, archery, and animals. Her symbols include the moon, the bow and arrow, and the deer. Her symbols include the winged sandals and caduceus.

Athena - Greek goddess of wisdom, defense, and war. Her symbols are the owl and the olive branch. She is the patron goddess of Athens.

Aphrodite - Goddess of love and beauty. Her symbols include the dove, swan, and rose. She is married to Hephaestus.

Demeter - Goddess of agriculture and the seasons. Her symbols include wheat and the pig.

Let's see the full list of the Primordial Greek Gods:

Achlys: the goddess of the eternal night. The first creature that some say existed even before Chaos himself. According to some versions, she was the first goddess.

Aether: the god of light. The spark of life for every creature. Etymologically, Aether means the highest and purest layer of the sky.

Aion: the god of eternity. He was a ghostly primordial deity who personified the meaning of time (sometimes he is confused with Chronos).

Ananke: the goddess of inevitability, compulsion, and necessity. She was an inevitable divine force.

Chaos: the god of the void. He was the beginning of all life. According to most versions of Greek myths, Chaos pre-existed the other gods.

Chronos: the god of time. Not to be confused with Aion (god of eternity) or Cronus (the Titan that we will meet later).

Erebus: the god of darkness and shadow. He symbolizes the silence and the depth of the night together with his sister, the goddess Nyx.

Eros: the god of love and procreation. Not to be confused with Eros, the winged god of desire that we will meet later.

Gaia: the goddess of the earth (Mother Earth). She is the mother of all - the primeval mother. At a cosmogenic level, she is the first goddess.

Hemera: the goddess of day.

Hypnos: the god of sleep and father of Morpheus.

Nemesis: the goddess of retribution.

Nesoi: the goddesses of islands.

Nyx: the goddess of night. She was a sovereign, primordial and cosmogenic entity, respected and feared by most gods. She is the mother of the Erinyes.

Ourea: the gods of mountains.

Pontus: the god of the sea and father of the sea creatures.

Tartarus: the god of the darkest and deepest part of the Underworld - the original god of the Underworld. The Underworld was ruled by Hades.

Thalassa: the goddess of the sea and consort of god Pontus.

Thanatos: the god of death. He is the twin brother of Hypnos (god of sleep) and lives in the dark Tartarus.

Uranus: the god of the heavens. He soon became ruler of the world and father of the Titans.

- List of Monsters
 - Medusa
 - Minotaurs
 - Centaurs
 - Satyrs
 - Cyclopes

```

Who is Medusa
Percy: Give me a second.. I need to think on that one.
medusa
medusa had the fearsome ability to turn anyone who looked her
who killed medusa
Percy: Oh wow, let me see what I can dig up for you
perseus killed medusa
danaë was the daughter of king of argos.
what is a centaur
Percy: Oh wow, let me see what I can dig up for you
these creatures may represent chaos and lack of reason, for e
tell me about Medusa
Percy: I'm thinking.....
Hmm, let me see what I can find medusa
In Greek mythology, Medusa (; Ancient Greek: Μέδουσα "guardia
According to Hesiod and Aeschylus, she lived and died on an i
tell me about Satyrs
Percy: I'm thinking.....
Oh wow, let me see what I can dig up satyrs
In Greek mythology, a satyr (Greek: σάτυρος, translit. sátyros

```

- What is Greek Mythology?
- What are myths?

```

what are myths
Percy: Great question!
prose writers from the same periods who make reference to myths include apuleius, petronius, lollianus, and heliodorus.
What is Greek Mythology
Percy: Great question!
[16]:15 greeks regarded mythology as a part of their history.

```

- Greek Terms (History, mythology etc.)
 - Alexander the Great
 - Sparta
 - Aristotle

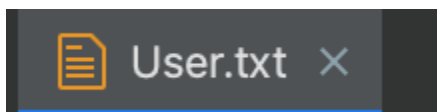
```

Who is Alexander the Great
Percy: Great question!
alexander the great
alexander the great was an ancient macedonian ruler and one of history's greatest military minds who, as king of macedonia and persia, establi
tell me more about Alexander the Great
Percy: You just really know what questions to ask don't you!
alexander the great
alexander the great was an ancient macedonian ruler and one of history's greatest military minds who, as king of macedonia and persia, establi
tell me more about Sparta
Percy: Oh wow, let me see what I can dig up for you
she told him to find the hesperides.
tell me about Sparta
Percy: I'm thinking.....
Hmm, let me see what I can find sparta
Sparta (Doric Greek: Σπάρτα, Spártā; Attic Greek: Σπάρτη, Spártē) was a prominent city-state in ancient Greece. In antiquity, the city-state w
Given its military pre-eminence, Sparta was recognized as the leading force of the unified Greek military during the Greco-Persian Wars, in ri
tell me about Aristotle
Percy: I'm thinking.....
I'm searching my brain for aristotle
Aristotle (; Greek: Ἀριστοτέλης Aristotélēs, pronounced [aristotélɛːs]; 384–322 BC) was a Greek philosopher and polymath during the Classical
tell me about Ancient Greece
Percy: I'm thinking.....
Hmm, let me see what I can find ancient greece
Ancient Greece (Greek: Ἑλλάς, romanized: Hellás) was a civilization belonging to a period of Greek history from the Greek Dark Ages of the 12t

```

Appendix of User Profile

```
User Profile: User
who is castor
who is the goddess of beauty
who is the god of war
who is the god of oceans
who's the god of sleep?
who is medusa
who killed medusa
what is a centaur
tell me about medusa
tell me about satyrs
what are myths
what is greek mythology
who is alexander the great
tell me more about alexander the great
tell me more about sparta
tell me about sparta
tell me about aristotle
tell me about ancient greece
thanks
```



The user profile is a text file created for each unique user. In this text file, the user's name is saved as well as the questions they ask the bot. Essentially, all user input is saved to the file and is appended to the file when the same user runs the program again.

The purpose of saving these questions is to see what the user is interested in and gauge where their interests are headed. With the scope of this chatbot, we can not determine what the user likes or dislikes only what they are interested in.

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