

```
1 import re
2 from importlib.resources.readers import remove_duplicates
3
4
5 class Data:
6
7     # list of possible type of questions ~ computer modified [non-exhaustive]
8     possibleList = [["capital", "distanc", "weather", "movi", "forecast", "cit", "length", "climat", "humidit", "director", "actor"], # direct-answer question
9                     ["exercis", "diet", "cook", "workout", "routin", "gym", "activit", "nutri", "wellness", "recipi", "fitnes"], # health-related questions
10                    ["calendar", "remind", "task", "schedul", "event", "deadlin", "project", "checklist", "alert", "notif", "organ"], # productivity questions
11                    ["scor", "gam", "jok", "song", "challeng", "puzzl", "music", "lyric", "match", "adventur", "humor"], # entertainment questions
12                    ["plu", "minus", "multipl", "divid", "formula", "concept", "ratio", "algebra", "geometr"], # mathematical questions
13                    ["pric", "mean", "fact", "happen", "latest", "explain", "differenc"], # knowledge-building question
14                    ["best", "advic", "help", "tip", "plan"]] # advice-seeking questions
15
16     # list of possible types of questions ~ original unmodified [non-exhaustive]
17     dictionaryList = [{"capital", "distance", "weather", "movie", "forecast", "city", "length", "climate", "humidity", "director", "actor"},
18                      ["exercise", "diet", "cook", "workout", "routine", "gym", "activity", "nutri", "wellness", "recipe", "fitness"],
19                      ["calendar", "remind", "task", "schedule", "event", "deadline", "project", "checklist", "alert", "notif", "organ"],
20                      ["score", "game", "joke", "song", "challenge", "puzzle", "music", "lyric", "match", "adventure", "humor"],
21                      ["plu", "minus", "multiple", "divide", "formula", "concept", "ratio", "algebra", "geometry"],
22                      ["price", "mean", "fact", "happen", "latest", "explain", "difference"],
23                      ["best", "advice", "help", "tip", "plan"]]
24
25     # list of possible cities that the user might reference [non-exhaustive]
26     specificPlaceList = ["Los Angeles", "Chicago", "San Francisco", "Miami", "Austin", "Las Vegas", "Paris", "London", "Tokyo", "Sydney", "Rome", "Barcelona",
27                          "Berlin", "Dubai", "Toronto", "Seoul", "Bangkok", "Mexico City", "Riverside", "Cape Town", "California", "Florida", "Texas", "New York", "Nevada", "Hawaii", "Colorado", "
28                          Alaska", "Arizona",
29                          "Utah", "Illinois", "Michigan", "Washington", "Georgia", "North Carolina", "Tennessee", "South Carolina", "Oregon", "New Jersey", "Virginia", "United States", "Canada", "
30                          United Kingdom",
31                          "France", "Italy", "Spain", "Mexico", "Germany", "Australia", "Brazil", "Japan", "India", "South Korea", "Thailand", "South Africa", "China", "Russia", "Egypt", "Argentina", "
32                          New Zealand", "Pakistan"]
33
34     # list of possible pop-culture references [non-exhaustive]
35     specificPopCultureList = ["The Avengers", "Star Wars", "The Matrix", "Harry Potter", "Jurassic Park", "Titanic", "The Godfather", "Pulp Fiction", "Back to the Future", "The
36     Lion King", # movies
37     "Apple", "Nike", "Tesla", "Coca-Cola", "McDonald's", "Amazon", "Google", "Adidas", "Disney", "Microsoft", # brands
38     "Friends", "Game of Thrones", "The Office", "Stranger Things", "Breaking Bad", "The Simpsons", "The Mandalorian", "The Crown", "The Walking Dead", "Westworld", # tv
39     shows
40     "The Beatles", "Beyonce", "Kanye West", "Taylor Swift", "Elvis Presley", "Michael Jackson", "Ariana Grande", "Drake", "Lady Gaga", "Eminem", # artists
41     "Super Mario Bros.", "Minecraft", "Fortnite", "The Legend of Zelda", "Call of Duty", "Grand Theft Auto", "Pokémon", "League of Legends", "FIFA", "The Witcher", # video
42     games
43     "Rolls-Royce", "Ferrari", "Lamborghini", "Porsche", "Maserati", "Bentley", "Aston Martin", "Bugatti", "McLaren", "Mercedes-Benz"] # automotive brands
44
45     # method that removes accidental duplicates found by regular expression
46     def __remove_duplicate(self, list):
47         accList = []
48         for i in list:
49             if i not in accList:
50                 accList.append(i)
51         return accList
52
53     # uses Python Regular Expressions to derive key data in a structural format, replicating a basic version of Natural Language Processing
54     # "QT" = Question Type && "I" = Identifier
55     def parsedData(self, userInput, original_input):
56         question_type = self.__remove_duplicate(re.findall(r"(what|who|why|where|when|how|will|can|play|lets|let|should|is|tell|give)", userInput))
57         identifiers = self.__remove_duplicate(re.findall(r"(capital|best|cit|length|climat|humidit|director|actor|task|schedul|event|deadlin|project|checklist|alert|notif|organ|advic|help|
58         tip|distanc|plan|weather|forecast|latest"
59         r"|happen|movi|exercis|song|diet|workout|explain|differenc|routin|gym|activit|nutri|wellness|recipi|fitnes|calendar|remind|cook|scor|pric|
60         mean|plu|ratio|minus|multipl|divid|"
61         r"|jok|gam|fact|formula|concept|algebra|geometr|challeng|puzzl|music|lyric|match|adventur|humor)", userInput))
62
63     # returns error if either one of the variables above is empty, else, normal dictionary returned
64     if len(question_type) < 1 or len(identifiers) < 1:
65         # extra step of autocorrect for better interpretation
66         issue = {"QT": question_type, "I": self.autoCorrect(userInput, self.possibleList).split()}
67         if self.autoCorrect(userInput, self.possibleList) != "ERROR":
68             print("I am assuming that you mean to say " + self.autoCorrect(original_input, self.dictionaryList) + ". The original word is autocorrected.\n")
69         return issue
70     else:
71         result = {"QT": question_type, "I": identifiers}
72         return result
73
74     # takes the original sentence inputted by the user and then removes suffixes; local change not global
75     def stemWord(self, userInput):
76         return re.sub(r'\b(?:!(is\b)))(e|es|ing|ed|s|se|ication|ization|isation|ized|ised|ied|ous|y|ies|tion|ent|ents|er|ers|ic)\b', "", userInput)
77
78     # finds any key data similar to the list above that might be misspelled to reinterpret input ~ similarity >= 70%
79     def autoCorrect(self, userInput, c_list):
80         inputList = userInput.split()
81         result = ""
82         count = 0
83         for r in range(len(c_list)):
84             for c in range(len(c_list[r])):
85                 for n in inputList:
86                     iter = min(len(n), len(c_list[r][c]))
87                     for i in range(iter):
88                         if list(n).__getitem__(i) == list(c_list[r][c]).__getitem__(i):
89                             count+=1
90                         elif (i + 1) < len(c_list[r][c]):
91                             if list(n).__getitem__(i) == list(c_list[r][c]).__getitem__(i + 1):
92                                 count+=1
93                     if (count / len(c_list[r][c])) * 100 >= 70:
94                         return c_list[r][c]
95                     count = 0
96         return "ERROR"
```