**Importing Modules**

import json

import random

* json: Used to save and load flashcards in a structured format (JSON file).
* random: Used to shuffle the questions in the quiz mode.

**Defining Constants**

FLASHCARD\_FILE = 'flashcards.json'

* FLASHCARD\_FILE: Specifies the name of the file used to store flashcard data.

**Loading Flashcards**

def load\_flashcards():

try:

with open(FLASHCARD\_FILE, 'r') as file:

return json.load(file)

except FileNotFoundError:

return {}

* This function attempts to load flashcards from the specified file.
* If the file exists, it reads and returns the JSON data as a dictionary.
* If the file does not exist, it returns an empty dictionary ({}).

**Saving Flashcards**

def save\_flashcards(flashcards):

with open(FLASHCARD\_FILE, 'w') as file:

json.dump(flashcards, file)

* This function saves the flashcards dictionary into the specified file using json.dump().

**Adding a New Flashcard**

def add\_flashcard(flashcards):

question = input("Enter the question: ")

answer = input("Enter the answer: ")

flashcards[question] = answer

print("Flashcard added!")

* Prompts the user to enter a question and its answer.
* Stores the question-answer pair in the flashcards dictionary.
* Prints a confirmation message once the flashcard is added.

**Viewing All Flashcards**

def view\_flashcards(flashcards):

if not flashcards:

print("No flashcards available.")

return

for question, answer in flashcards.items():

print(f"Q: {question}")

print(f"A: {answer}\n")

* Checks if there are any flashcards.
* If there are none, it prints a message.
* If flashcards exist, it loops through the dictionary and prints each question and its corresponding answer.

**Quiz Mode**

def quiz(flashcards):

if not flashcards:

print("No flashcards available.")

return

questions = list(flashcards.keys())

random.shuffle(questions)

for question in questions:

print(f"Q: {question}")

user\_answer = input("Your answer: ")

correct\_answer = flashcards[question]

if user\_answer.lower().strip() == correct\_answer.lower().strip():

print("Correct!")

else:

print(f"Wrong! The correct answer is: {correct\_answer}")

print()

* Checks if there are any flashcards; exits if none are available.
* Converts the dictionary keys (questions) into a list and shuffles them randomly.
* For each question:
  + Displays the question and prompts the user for an answer.
  + Compares the user's answer with the correct one (ignoring case and extra spaces).
  + Displays whether the answer is correct or wrong, showing the correct answer when wrong.

**Main Function**

def main():

flashcards = load\_flashcards()

while True:

print("\nFlashcard App")

print("1. Add Flashcard")

print("2. View Flashcards")

print("3. Quiz Yourself")

print("4. Exit")

choice = input("Choose an option: ")

if choice == '1':

add\_flashcard(flashcards)

save\_flashcards(flashcards)

elif choice == '2':

view\_flashcards(flashcards)

elif choice == '3':

quiz(flashcards)

elif choice == '4':

save\_flashcards(flashcards)

print("Goodbye!")

break

else:

print("Invalid choice, please try again.")

* Loads flashcards from the file at the start.
* Displays a menu with four options:
  1. Add a new flashcard.
  2. View existing flashcards.
  3. Take a quiz with flashcards.
  4. Exit the application.
* Based on the user's choice:
  1. Calls the corresponding function for the selected option.
  2. Saves flashcards after addition or before exiting.
* Exits the program when the user chooses option 4.

**Entry Point**

if \_\_name\_\_ == "\_\_main\_\_":

main()

* Ensures the main() function runs only when the script is executed directly, not when imported as a module.

This code provides a simple flashcard application with options for adding, viewing, and quizzing flashcards, along with persistent storage using JSON.