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Foundations of Programming (Python)

Assignment05

Dictionaries in Python

Introduction

This document is a brief overview of dictionaries in the Python programming language. To demonstrate dictionaries, a Python script for keeping track of chores is given. With the Python script someone can add or remove tasks and their priority from a list.

Loading a list of tasks

A program that keeps track of a list of tasks needs to store information in a file because when a program is ended any data used is lost. When a program is run for the first time there may not be a file for it to read. A statement known as a “try block” is used to handle the case where a program attempts to load a file that does not exist. The try block attempts to load a file and if none exists it lets the program continue without error. If an appropriate file exists, the program loads the file from storage into the computer's active memory as a list of dictionary items.

Dictionary Items

Dictionary items are a collection of data that have key names. Normally collections of data have a number that tells where they are. Dictionaries in Python have key words to keep track of pieces of data in a collection. In the python script each chore has two parts and two keywords for it and a Dictionary is used to keep track of it. A chore has the keyword “task” for the chore and “priority” for how urgent the task is.

```
29  try:  # try to read in a file
30      objFile = open(strFile, "r")
31      for row in objFile:
32          lstRow = row.split(",")
33          dicRow = {"Task": lstRow[0], "Priority": lstRow[1].strip()}
34          lstTable += [dicRow]
35      objFile.close()
36  except:  # if a file isn't found don't worry about it
37      print("\nFile not found.")
```

Figure 1. Try (line 29) to run the code to read a file (line 30) for each row in the file (line 31) split it up (line 32) according to the dictionary of task and priority (line 33) and place that row into a list in memory (line 34). If Python tries to read a file that doesn't exist, it will skip to line 37 without crashing.

The Menu

A handy menu is presented to the person running the chore program, they are presented with five options to help them organize their life. First they may see the chores the program has for them. Second they may add something to the list. Third they may remove something from the list. Fourth they may save the items in the computer's memory to a file in the computer's storage for later use. Finally, they may exit the program to get some chore work done.

Adding to the list

If the user chooses to add to their list of responsibilities, they are prompted for the name of the task and its priority. The task and priority are placed in a dictionary object that keeps track of the input by the keyword's "task" and "priority". The new dictionary object (chore) is then put in a list with any other chores that may be there and is held in the computer's memory.

Removing from the list

If the program user chooses to remove an object from the list of chores, they may. The user is prompted for the task they wish to remove. The list of chores in the computer's memory is clicked through and if a task in the list matches the user's wish the task is deleted from the list.

Saving to a file

A computer's memory is where data is stored to be used by a program. A computer's storage is too slow for a program to use. Programs may need to do complex operations and people may not want to wait around for a program to work. Unless a program is to run all the time it is necessary to save data to a file

in storage because once a program stops running any data memory the program was using is lost or written over by some other program.

The list of chores used in the showing, and adding done by the user is in the computer's memory and to be usable after the program needs to be saved. To save the list of chores a file is opened or created and the contentents of the chore list are written to a file for later use.

Exiting a Program

Whenever the user is prompted, they may end the program even if they have not saved it.

Summary

At the start of the example script a "try block" is used to enable the program to run even if Python attempts to load a file that does not exist. Dictionaries are a Python way for collecting data by keywords instead of the usual way organizing by number. A file stores data that can be uploaded into a computer's memory for a program to use. A menu is useful for communicating the purpose of a program. Once in memory a user may select different ways of changing data. A computer's memory is unstable and generally not usable to a program after the program ends so it must be saved. Data in memory used by a program is saved to storage for later use.

```
Microsoft Windows [Version 10.0.19044.2604]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Kasey>python C:\_PythonClass\Assignment05\Assigment05.py

File not found.

    Menu of Options
    1) Show current data
    2) Add a new item.
    3) Remove an existing item.
    4) Save Data to File
    5) Exit Program

Which option would you like to perform? /[1 to 5] - 2

Task: Brush pet bat
Priority: medium
Exit? ('y/n'): n

    Menu of Options
    1) Show current data
    2) Add a new item.
    3) Remove an existing item.
    4) Save Data to File
    5) Exit Program

Which option would you like to perform? /[1 to 5] - 1

Brush pet bat, medium


    Menu of Options
    1) Show current data
    2) Add a new item.
    3) Remove an existing item.
    4) Save Data to File
    5) Exit Program

Which option would you like to perform? /[1 to 5] - 4

Data saved.
```

Figure 2. An example run of the python script from the command line

```
C:\Users\Kasey\AppData\Local\Programs\Python\Python311\python.exe C:\_PythonClass\Assignment05\Assigment05.py

File not found.

    Menu of Options
    1) Show current data
    2) Add a new item.
    3) Remove an existing item.
    4) Save Data to File
    5) Exit Program

Which option would you like to perform? /[1 to 5] - 1

Carpe diem!

    Menu of Options
    1) Show current data
    2) Add a new item.
    3) Remove an existing item.
    4) Save Data to File
    5) Exit Program

Which option would you like to perform? /[1 to 5] - 2

Task: Feed Billy the Bat
Priority: High
Exit? ('y/n'): n
```

Figure 3. No file found, the program still runs, checking the current list which is empty a default message “Carpe diem” prints. Adding a task.

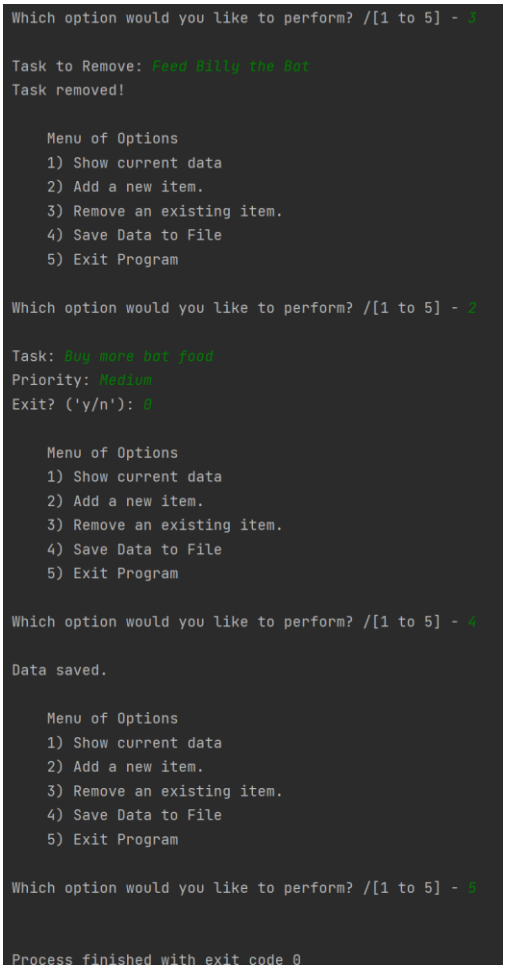

Figure 4. Removing a task, adding a new task, saving data and exiting.

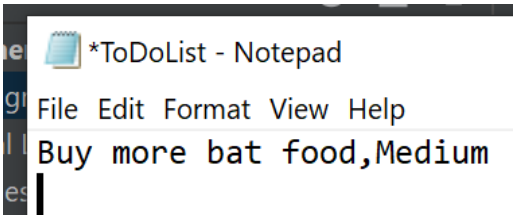

Figure 5. Data saved to the file before exiting.