Assignment 3

Submission Date: 11 January 2020, 06:00 AM
Submission Mode: Soft-copy / MS Teams

- **You have to submit single .py file**. Make sure file name of your submitted must be your roll number.
- You are provided a file as a template. You can use the file for your solution.
- Make sure that function names must be similar as asked in the assignment.
- You must read Academic Integrity at the end of this document.

Frequencies and Hash-Table

We are processing for a logistic company handling a huge number of parcels every day. The handling a huge number of deliveries required a planning as well. The company has divided the city into different block of locations such as Gulshan Block 4 is considered one location - each location is identified by a number.

At the end of each day, we have to find the number of parcels remaining for each location and a file is maintained for the entrance and exist locations. This information is critical to strategically plan the next day. Whenever a new parcel passes through entrance, it's location ID is stored in a file and a similar file is also maintained at the exit location for any parcel going outside the warehouse. Presently, it is taking too much time therefore it is decided to automate this process by writing a small utility.

We are provided two text files in which each line contains a number representing the Location ID for the parcel. As discussed above, the entrance file contains the Location IDs for parcels received whereas the exit file contains the Location IDs for parcel going for delivery. Our goal is to generate the list of Location IDs with remaining number of parcels.

Implementation

HashTable:
You have to implement the Hash-Table with linear probing. This file will store each location as a key and its frequency as value. The signature and details of required functions are given in the provided code template. You may add other functions if required.

FrequencyTable:
This call is a kind of wrapper for the HashTable class in order to implement the logic of frequency. The signature and details of required functions are given in the provided code template. You may add other functions if required.

FrequencyUtility:
This class is responsible to read the data from the file and store in to FrequencyTable in order to generate frequency for each location.

Code:	See the provided code template

Example:

Consider the following files:

For entrance:

```
121345
675839
563719
982756
12364
14653
12364
121345
121345
563719
```

For exit:

```
982756
12364
14653
12364
121345
```

```
The testing code must print the following output (order can vary):
[(121345,2), (675839,1), (563719,2)]
```

Academic Integrity

Each student in this course is expected to make sure that any work submitted by a student in this course for academic credit will be the **student's own work**. Scholastic dishonesty shall be considered a serious violation of these rules and regulations and is subject to strict disciplinary action. Scholastic dishonesty includes, but is not limited to, cheating on exams, plagiarism on assignments, and collusion.

PLAGIARISM: Plagiarism is the act of taking the work created by another person or entity and presenting it as one's own for the purpose of personal gain or of obtaining academic credit. Plagiarism includes the submission of or incorporation of the work of others without acknowledging its provenance or giving due credit according to established academic practices. This includes the submission of material that has been appropriated, bought, received as a gift, downloaded, or obtained by any other means. Students must not, unless they have been granted permission from all faculty members concerned, submit the same assignment or project for academic credit for different courses.

CHEATING: The term cheating shall refer to the use of or obtaining of unauthorized information in order to obtain personal benefit or academic credit.

COLLUSION: Collusion is the act of providing unauthorized assistance to one or more person or of not taking the appropriate precautions against doing so. Any student caught violating academic integrity will suffer an academic penalty. All violations of academic integrity will also be immediately reported to the Disciplinary Committee. Any student violating academic integrity a second time in this course will receive a failing grade for the course, and additional disciplinary sanctions may be administered through the Disciplinary Committee.

Conclusively, each student needs to take care of:

1. You must not share your solutions with other students. You are encouraged to discuss the problems but each student is supposed to take care of his or her own solution.
2. You must not submit solution of other students as yours.
3. You must duly cite all resources you used in development of your solution.