MIDDLE EAST TECHNICAL UNIVERSITY, NORTHERN CYPRUS CAMPUS
CNG445 Software Development with Scripting Languages

Date handed out: 24 March 2020, Tuesday
Date submission due: 07 April 2020, Tuesday 23:59

Assignment 1: Object-Oriented Programming with Python

This assignment aims to help you practice object-oriented design and programming in Python. On the successful completion of this assignment, you will also practise Python basics. Your main task in this assignment is to develop an application for a research institute for effective record keeping and reporting.

Application Overview

The research institute is responsible for researching and developing methods for animals. It keeps animals in controlled environments and monitors their progress under controlled feeding. You can find some examples of existing manual records of the research institute. You are expected to develop an application to effectively keep track of these details and provide necessary reports.

Staff room list

Staff ID	First name	Last name	Office	Tel
111282	Harry	Wilson	A-123	1234
282333	Jacob	Williams	A-124	1245
333464	Oliver	Smith	A-125	1256
444555	Oscar	Evans	A-126	1267

Animal Feeding Record

Animal No:	1234				
Date	Time	Food name	Manufacturer	Weight (gr)	Staff
18/08/2018	09:30	Pigplus	RHM	1000	Harry Wilson
18/08/2018	15:00	Vitax	Browns	500	Harry Wilson
19/08/2018	09:00	Pigplus	RHM	2000	Oscar Evans
19/08/2018	15:30	Vitax	Browns	750	Oliver Smith

Animal Record Card

Animal Information					
Animal No:	1234				
Gender:	M				
Birth date:	25/06/2016				
Colour:	Black				
Environment Conditions					
Relative Humidity:	63				
Enclosure Size (m²):	10				
Temperature:	22				
Hours of light per day:	11				
Date	Time	Animal Weight (kg)	Temperature (C°)	Note	Staff
19/09/2018	10:05	10.5	35		Oscar Evans
20/09/2018	10:10	10.4	35.5	Decrease	Oscar Evans
21/09/2018	9:55	10.4	35	Stable	Oscar Evans

You are expected to use object-oriented programming for developing this application, and therefore you need to design appropriate classes and relationships between these classes. The application should also be easy to use.

Application Setup

You need to have an object for the application and this object should be stored in a txt file. Therefore, the program should take the file name as a command line argument and load the application when the program is started. The following line shows an example of how you should execute the program with a file name.

```
python researchinstitue.py app.txt
```

If the users want to create a new information application, then they should execute the program without a file name and then they should enter the name of the application (which will be used as a file name to store the application object) when the program is started. The following line shows an example of how you should execute the program without a file name.

```
python researchinstitue.py
```

When the users exit from the program, the updated version of the application should be saved again in the specified file.

Application Functionalities

This application should have the following functionalities:

1. The application should be able to add a new staff, a new food, a new animal along with the environment conditions, a report of animal feeding and a report of animal observation.

   The application should ensure that each staff has a unique ID with 6 digits. The telephone number should consist of 4 digits and the office number should be in following format where X represents a digit: A-XXX.

   The application should also ensure that each animal has a unique ID with 4 digits. An animal should not be fed more than two times in a day and should be observed more than three times in a day.

   You need to use the `datetime` module[1] of Python to keep track of date and time where necessary.

2. The application should be able to produce the following reports. Each report should be printed both on a screen and also exported as txt file.
   a. Details of all staff (Staff ID, First name, Last name, Office, Tel)
   b. Feeding details of a given animal between specified dates (Date, Time, Food name, Manufacturer, Weight, Staff)
   c. Observation details of a given animal between specified dates (Date, Time, Animal Weight, Temperature, Note, Staff)
   d. Staff who have observed a given animal (Staff ID, First name, Last name, Office, Tel)
   e. Foods that have been fed to a given animal (Food name, Manufacturer)

Rules

- You need to write your program by using Python 3.x.
- You can use all built-in functions and modules.

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[1] https://docs.python.org/3/library/datetime.html

- You need to have a separate file for each class.
- You need to put all your files into a folder which is named with your student id(s) and submit the compressed version of the folder.
- Only one team member should submit the assignment.
- The code quality, modularity, efficiency and appropriate comments will be part of the grading.

Grading Policy

The assignment will be graded as follows:

Category	Grading Item	Mark (out of 100)
OO Design	Classes	10
	Relationship between classes	5
Setup	With a file	5
	Without a file	5
Main	Allow the user to apply the addition operations and produce reports in the application	5
Addition	Staff	5
	Food	5
	Animal	5
	Feeding	5
	Observation	5
Report	Details of all staff	5
	Feeding details on a given animal between specified dates	10
	Observation details on a given animal between specified dates	10
	Staff who have observed a given animal	10
	Foods that have been fed to a given animal	10