

LAB ASSIGNMENTS
PYTHON PROGRAMMING LAB
MCA 1st Year 1st Semester, 2022
Subject Code: MCAP1112
Day 7

1. Write a program which can iterate through a list of users (tuples comprising of a name, email and age) and if the user is at least 18 years old, adds her/him to a dictionary. Write an exception hierarchy which defines a different exception for each of these error conditions:
 - the name is not unique
 - the age is not a positive integer
 - the user is under 18
 - the email format is not valid

Raise these exceptions where appropriate. Whenever an exception occurs, your program should move onto the next set of data in the list. Print different error messages for each different kind of exception.

2. Create an *OrdinaryCounter* class, which mimics a physical clicker counter — the kind people use at entrances to events and buildings to count how many people are coming in. It may have an *initializer* that initializes count to zero, *increment*, to increment the counter, *clear*, to reset the counter to zero, and *get_value*, to get counter value. Create a *SpecialCounter* class that behaves somewhat like the *OrdinaryCounter*, but always increment by two instead of one, and also has functionalities to decrement counting.
3. Write an “abstract” class, *Bag* and use it to define some methods which any bag object should have: *add*, for adding any number of items to the bag, *empty*, for taking all the items out of the bag and returning them as a list, and *count*, for counting the items which are currently in the bag. Write a class *Item*, which has a *name* attribute and a *value* attribute – you can assume that all the items you will use will be *Item* objects. Now write two subclasses of *Bag* which use different underlying collections to store items: *ListBag* should use a list, and *DictBag* should use a dict.

Write a function, *repack_bags*, which takes any number of bags as parameters, gathers up all the items they contain, and redistributes them as evenly as possible over all the bags.

Test your code with a *ListBag* with 20 items, a *ListBag* with 9 items and a *DictBag* with 5 items. You should end up with two bags with 11 items each, and one bag with 12 items.