CSE474 - Lab Task 2

1. Create a class named *Accident* with the following attributes:

   beginning_time, ending_time, location, no_of_casualties, no_of_injured, financial_loss, impact_factor, list_of_casualties, list_of_injured

   beginning_time and *ending_time* should be datetime objects, as defined in the datetime library (you can import it in python). *location* should be a character string, *no_of_casualties* and *no_of_injured* will be integers, and *financial_loss* will be the incurred loss in BDT.

   Impact factor will be calculated by $\log_e(no\_of\_injured+1) + \text{sqrt}(no\_of\_casualties) + (1.12)^{financial\_loss/100}$

   list_of_casualties and *list_of_injured* will be lists of dictionaries. The dictionaries will have three keys, namely, *name, age,* and *NID_no*. Initially, these lists will be empty, and *no_of_casualties* and *no_of_injured* will be set to 0.
2. Create four child classes *Road_Accident, Plane_Crash, Fire_Accident,* and *Marine_Accident* of the *Accident* class. Each of them will have one additional parameter [*list_of_cars* (a list of strings), *list_of_planes* (a list of strings), *source_of_fire* (a string), and *launch_tracking_number* (a floating point number) respectively].
3. Write `__init__` and `__str__` functions for the parent *Accident* class. Initialize with *beginning_time, ending_time*, and *location*. If *ending_time* is missing as a parameter, make it equal to *beginning_time*. If both are missing, assign "2021". If *location* is missing, assign "Dhaka". Both these functions should be inherited by the child classes. The function __str__ should print all attributes of an instance.
4. Write `_update_injured` and `_update_casualties` functions in the parent class (*Accident*). They will take in either an integer or a list or both as parameters. If only an integer **n** is given as the parameter, add it to the corresponding *no_of_casualties* or *no_of_injured*, and append **n** dictionary items in the list with {"name" : "unknown", "age" : "unknown", "NID_no" : "unknown"}. If a list is given as a parameter, append it to the corresponding list, and update the number of casualties/injured. If both a number and a list are given as parameters, do both.
5. Write a `_merge` function. If `_merge(event1, event2)` is called, their types, *date, time,* and *location* will be compared. If the type matches, their *location* attributes match, and their timelines overlap, create a new object by merging their details. The *location* should remain constant, and *beginning_time* and *ending_time* should be easy to evaluate. Merge the lists of injured/casualties and update their numbers accordingly. Finally, delete the objects event1 and event2, and return the new object.

Submit within 16 November, Tuesday 1:59 PM.
Your code should be well-commented.
The programming language should be Python3.