Topics:
Classes, Objects, Functions, Methods.
[*100 + 40 points*]

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1. Traffic Lights
[*30 points*]

It is strongly recommended to finish Chapter-15 examples, and do the exercises before starting this task.

a) Write a definition for a class named `TrafficLights` with attributes `corner`, `box` and `lights`, where `corner` is a `Point` object, `box` is a `Rectangle` object, and `lights` is a list of `Circle` objects.

b) Write a function called `draw_traffic_lights` that takes a `Turtle` object and a `TrafficLights` object, and uses the `Turtle` to draw the Traffic lights.

c) Write a function that returns a copy of the existing traffic lights. Demonstrate the difference between shallow and deep copy.

1. Bonus Task
[*+20 points*]:
Make the traffic lights change their color dynamically in turn, for instance, every 5 seconds.

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2. Product
[*30 points*]

Create a complete product object. The class must have the following methods:

a) `__init__`: creates an object with the following properties:
- `name`: product name
- `price`: product price
- `quantity`: number of product items (zero by default).

b) `subtract`: decreases the product quantity by the given amount.

c) `add`: increases the product quantity by the given amount.

d) `print_total` as a function:
Calculates and displays the total cost of a given list of products.
In case of discount (shown in percentage %), it shall be subtracted from the total price.
The quantity of the sold products shall be subtracted from the total amount.

2. Bonus Task
[*+10 points*]:
Deal with the case when product quantity is not enough (Exception).

Ex:

```
p1 = Product('Tassay 5lt', 250, 10)
p2 = Product('Aksay Nan', 70, 50)
p3 = Product('Albeni', 110, 35)

p1.subtract(2)
print(p1)

p2.add(10)
print(p2)

product_list = [(p1,2),(p2,3),(p3,5)]
print_total(product_list)

print(p1)
```

```
>>>
'Tassay 5lt': 8 items x 250 tenge
'Aksay Nan': 60 items x 70 tenge

Magnum Kaskelen
Receipt
--------
1  Tassay 5lt  250 tg x  2 =   500
2  Aksay Nan    70 tg x  3 =   210
3  Albeni      110 tg x  5 =   550
=============
Total:  1260.0

'Tassay 5lt': 6 items x 250 tenge
>>>
```

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3. Student

[*40 points*]

Create a `Student` class that keeps all student data, and provides all the necessary data management options.
Make sure that the program works exactly as shown below.
Ex:

```
s1 = Student('Zamanbek', 77777, 3.99)     # creates a new student
print(s1,'\n')

st = read_from_file('Students.txt')  # creates a list of students from data in a given file
print(st[0])
print()

print_list(st)   # prints out a list of students in a given format
print()
```

```
top3(st)     # prints out top three students from a given list
print()
print_list(st)   # the original list does not change

>>>
Zamanbek, ID:77777, GPA:3.99

Bauyrzhan, ID:14000, GPA:3.3

1  Bauyrzhan 14000  3.3
2  Shyntemir 14001  2.8
3  Azat      14005  3.5
4  Almas     14007  2.4
5  Zhanibek  14010  3.6
6  Mariyam   14011  3.4
7  Tolegen   14023  1.9
8  Saule     14034  3.0
9  Abay      14035  2.7

1  Zhanibek  14010  3.6
2  Azat      14005  3.5
3  Mariyam   14011  3.4

1  Bauyrzhan 14000  3.3
2  Shyntemir 14001  2.8
3  Azat      14005  3.5
4  Almas     14007  2.4
5  Zhanibek  14010  3.6
6  Mariyam   14011  3.4
7  Tolegen   14023  1.9
8  Saule     14034  3.0
9  Abay      14035  2.7
>>>
```

3. Bonus Task

[*+10 points*]:
Add an extra parameter to the `print_list` function to be able to print the list in a sorted order (by Name, ID, or GPA). By default, it shall display the list as it is.

==========END.