
Lab Objectives: searching, sorting, complexity.

1. Download the class, `Birthday`. Review this class to understand the attributes (instance data and methods) of a Birthday object.
 - a. Add the method `__lt__` to the class. A `Birthday` is less than another `Birthday` if its name is less than the other name.
 - b. Add the method `__eq__` to the class. A `Birthday` is equal to another `Birthday` if its name is the same as the other name.
2. Write a script, `BirthdayApp.py` which will contain the following methods:
 - a. `read_birthdays()`: takes a filename as a parameter, and returns a list of Birthday objects using the data from the file with the given name.
 - b. `selection_sort()`: takes a list of Birthday objects and sorts the Birthdays using the selection sort algorithm in ascending order of names.
 - c. `linear_search()`: takes a list of Birthday objects, a month and a day and returns the **list** of matching names.
 - d. `binary_search()`: takes a list of **sorted** Birthday objects and a name and then returns the birthday object with the given name **recursively**. If not found, the function returns None.
3. In the script, do the following:
 - a. Read the Birthdays from the file `birthday.txt` (download sample file from Moodle) into a list, using the function `read_birthdays`. A person with the same name will not be added to the list and an appropriate message will be given.
 - b. Input a month and a day value and display the list of people born on that day if exists.
 - c. Sort the list using `selection_sort` function and display **the sorted list**.
 - d. Input a name and display his/her birthday as in the sample run.

Sample Run:

```
Alara Zengin is already in the list
```

```
Enter the month: 4
```

```
Enter the day: 6
```

```
People Born on the given day: ['Mert Ali', 'Yaprak Kosar']
```

```
Sorted List
```

```
[Alara Zengin: 25/8, Batuhan Karakus: 3/5, Bora Sonmez: 3/11, Deniz Kara: 3/11, Elif Senturk: 25/1, Emre Yalcin: 21/12, Irem Su Basar: 2/10, Kamil Topal: 15/11, Mert Ali: 6/4, Ozge Burak: 1/3, Yaprak Kosar: 6/4, Yasemin Cicek: 21/12]
```

```
Enter a name to search: Ozge Burak
```

```
Ozge Burak: 1/3
```

Sample Run:

```
Alara Zengin is already in the list
```

```
Enter the month: 2
```

Enter the day: 10

No birthday on that Day!

Sorted List

[Alara Zengin: 25/8, Batuhan Karakus: 3/5, Bora Sonmez: 3/11, Deniz Kara: 3/11, Elif Senturk: 25/1, Emre Yalcin: 21/12, Irem Su Basar: 2/10, Kamil Topal: 15/11, Mert Ali: 6/4, Ozge Burak: 1/3, Yaprak Kosar: 6/4, Yasemin Cicek: 21/12]

Enter a name to search: Can Yengul

None