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4. Office hours

At a school parents can make appointments for the office hours of teachers through a web interface. In this exercise you have to work on the data of a day when the teachers offer office hours. The office hours are from 16:00 to 18:00, the available times are 16:00, 16:10, 16:20 ... 17:50. One appointment lasts for 10 minutes. Conflicts are not allowed by the program that checks the appointments.

File `appointments.txt` contains the teachers' appointments. One line contains the following data separated by spaces: the teacher's family name; given name; the time of the appointment; the date and time of the reservation of the appointment. Each teacher's name consists of exactly one family name and exactly one given name. Hour, minute, month and day data are all stored with two numerals in the file. The file definitely contains fewer than 500 lines and the data are ordered at random.

For example:

```
...  
Nagy Marcell 16:30 2017.10.29-20:32  
Fodor Zsuzsanna 17:10 2017.10.28-23:12  
Lakatos Levente 16:00 2017.10.30-08:24  
...
```

According to the first line of the example teacher Nagy Marcell has an appointment for 16:30, which was reserved on 29/10/2017 at 20:32.

Create a program that uses the data from file `appointments.txt` to answer the following questions. Save the source code of the program as `office`. (When writing the program, you do not have to check the correctness or the validity of the data provided by the user, you can assume that the data available correspond to the description.)

Before you display the result of exercise parts that require printing on the screen, display the exercise number (for example `Exercise 2:`). If you request data from the user, display what data you expect. Displaying without accents is also acceptable.

1. Read and store the contents of file `appointments.txt`.
2. Display the number of appointments the file contains data about.
3. Request a teacher's name from the user and then display the number of appointments for the given teacher on the screen according to the example. If the given teacher does not have any appointments yet – for example Farkas Attila –, then display message “No appointments for the given name.”
4. Request a valid time from the user in the format used in the source file (e.g. 17:40). Display the list of teachers who have an appointment for the given time on the screen. Display one name in each line. The list should be ordered alphabetically. Write the ordered list into a file as well, the file should also contain one name in each line. Use a file name that corresponds to the time, for example in the case of 17:40 store the data into file a `1740.txt`. Pay attention that the file name does not contain the colon character. (If you cannot create a file with this name, you may use the file name `data.txt`.)
5. Determine and then display on the screen every data of the time that was reserved the earliest. Follow the example given at the end of the exercise exactly when you display the data.

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6. Display the free times for teacher “**Barna Eszter**” on the screen. We know that she has at least one reserved and several free appointment times. The teacher can leave the school after her appointment with the last parent. When can she leave at the earliest? Display the time in an identifiable format on the screen.

45 marks

Example for formatting the textual outputs:

```
Exercise 2:  
Number of appointments: 161  
  
Exercise 3:  
Enter a name: Nagy Ferenc  
6 appointment(s) for Nagy Ferenc.  
  
Exercise 4:  
Enter a valid time (e.g. 17:10): 17:40  
Beke Bianka  
Csorba Ede  
Fodor Zsuzsanna  
Hantos Hedvig  
Keller Katalin  
Magos Magdolna  
Nagy Marcell  
Olasz Ferenc  
Papp Lili  
Szalai Levente  
Veres Gergely  
  
Exercise 5:  
Teacher's name: Csorba Ede  
Appointment: 16:30  
Time of reservation: 2017.10.28-18:48  
  
Exercise 6:  
16:00  
16:10  
17:00  
17:40  
17:50  
Barna Eszter can leave at 17:40 at the earliest.
```