# 4. Bath

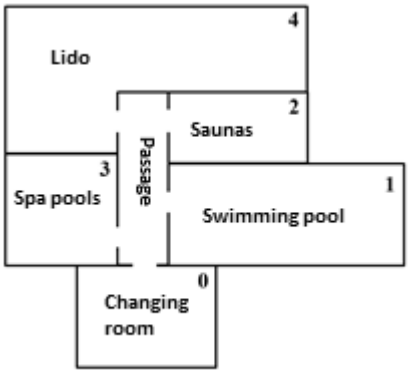
In baths the use of access control and movement monitoring systems is getting more and more frequent. Due to the improvement of services, a bath would like to analyse the bathing habits of guests. For this reason, the guests' data were taken at random from a daily census.

The bath has four separate sections. The guests reach the sections of the bath through the passage that starts at the changing room, and they also leave the bath through the changing room. Each guest receives an armband upon entry. The sensor on the armband registers each entry into or exit from a section. Each guest exits from the changing room once – when they enter the internal area of the bath –, and enter the changing room once – when they leave the bath. Once they have left, they do not enter the bath again. The bath is open from 6 o'clock to 20 o'clock.

File *bathdata.txt*, which is tagged by spaces, contains at most 800 data lines. The file contains the data of 100 guests of the bath. The list is grouped by guests, within that ordered by time. The order of guests is determined by the time they exit from the changing room.

- The first value in a line is a three-digit number, which is the guest's identifier.
- The second value in the line is the identifier of the bath section.

| Section | Identifier |
|---|---|
| Changing room | 0 |
| Swimming pool | 1 |
| Saunas | 2 |
| Spa pools | 3 |
| Lido | 4 |




- The third value in the line is 0 if the guest entered the given section and 1 if they exited from it.
- The fourth, fifth and sixth values in the line are the time of entry into or exit from the given section in hour minute second, 24-hour format.

For example:

```
453 0 1 6 15 27
453 1 0 6 17 19
453 1 1 6 52 56
453 0 0 6 56 32
        …
266 0 1 16 7 52
266 4 0 16 9 30
        …
```

The example shows a few data of guests with identifiers 453 and 266. Guest 453 exited from the changing room at 6:15:27 and entered the swimming pool at 6:17:19. He/she exited from the swimming pool at 6:52:56 and entered the changing room at 6:56:32.

Create a program that uses the data in file *bathdata.txt* to answer the following questions. Save the source code of the program as *bathstat*. (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 4:`). Displaying without accents is also acceptable.

1. Read the contents of file *bathdata.txt*.
2. Display on the screen the time when the first and last guests exited from the changing room.
3. Determine and display on the screen the number of bath guests who visited only one section apart from the changing room and used that section only once.
4. Determine which guest spent the longest time in the bath. Display the guest's identifier and the time spent in the bath on the screen. If several guests spent the longest time in the bath, it is enough to display only one guest's data.
5. Create statistics to count the guests who entered the bath between 06:00:00-08:59:59, 09:00:00-15:59:59 and 16:00:00-19:59:59. Display the results on the screen in the format shown in the example.
6. Create a list about the guests who visited the sauna section and the time spent by them there. Write the guest's identifier and the time spent in the section into file *sauna.txt*. The file should contain the guest's identifier and then separated by a single space the time spent in the section in hour:minute:second format in a line. Pay attention to the fact that a guest could have visited the sauna section several times a day.
7. Create a list that gives the number of guests for each section. Display the result on the screen according to the example. If the guest visited a given section several times a day, count it only as one in the statistics.

Example for formatting the text outputs:

```
Exercise 2:
The first guest exited from the changing room at 6:14:56.
The last guest exited from the changing room at 18:35:37.

Exercise 3:
33 guests visited only one section.

Exercise 4:
The guest who spent the longest time in the bath:
Guest 306: 6:41:19

Exercise 5:
Between 6 and 9 o'clock 9 guests
Between 9 and 16 o'clock 45 guests
Between 16 and 20 o'clock 46 guests

Exercise 7:
Swimming pool: 41
Saunas: 52
Spa pools: 54
Lido: 48
```