

Programming Project Task

Scheduling

Summer camps provide a useful way for students to spend their summer break. A survey was conducted in a school class to find out which students would like to participate in which camps. In this task, we will process the data from this survey.

The file `camps.txt` contains the camp data, where each line represents one camp. The file contains at most 100 lines. The first two pairs of numbers represent the start and end dates of the camp. The first value of each pair is the month, and the second value is the day. Since these are summer camps, only dates between June 16 and August 31 are valid. The dates are followed by the letter codes of the students who are interested in the camp, and finally, the theme of the camp is listed. The student letter codes are single uppercase letters from the English alphabet, and the camp theme is a single word without accents.

A sample of the first few lines from the file:

6 26 7 10 GIOSY soccer

7 14 7 21 FPUY drama

7 27 8 2 DKPRX religion

7 28 8 6 FJLOP scout

7 9 7 14 FKO mushrooming

In the second line, a drama camp starts on July 14 and ends on July 21, making it an 8-day camp. There are 4 students interested in it, who are identified by the letters F, P, U, and Y.

Tasks

1. Read and store the content of the `camps.txt` file.
2. Display how many camps are listed in the input file and show the themes of the first and last camp recorded.
3. Display the start date of the "music" camp(s). If there are multiple such camps, display them all. If no music camp exists, display the message: "No music camp found."
4. Find out which camp has the most students signed up. Display the start date and theme of the camp. If multiple camps have the same number of students, display them all.
5. Create a function that calculates the day number within the summer vacation for a given date. The date is provided as two integers representing the month and the day, and the function should return an integer. The first day of summer vacation is June 16 (month 6, day 16), and the 77th day is August 31 (month 8, day 31). The months are assumed to have the following number of days: June (30), July (31), and August (31). You will use this function in further tasks.
6. Ask the user for a date (day and month) and determine how many camps are ongoing on that date.

7. Ask for a student's letter code and determine which camps that student is interested in. List the camps in ascending order by start date and write the results to a file. Also, display whether the student can attend all the camps without scheduling conflicts (i.e., without needing to be in more than one camp on the same day).
8. For this final task, use your creativity to think of an additional problem that is related to the core project you have worked on. This could involve extending the functionality, optimizing the current solution, or adding new features. Your task must:
 - Be clearly connected to the project's theme or core functionality.
 - Require you to write new code or make significant changes to the existing codebase.
 - Include a description of what you're trying to solve or improve.