

- `quit` - The program terminates with the return value `EXIT_SUCCESS` without printing anything.
- `themes` - Prints all known themes in alphabetical order, one below the other, for example:

```
> themes
Cooking
Dance
Exercise
Handcraft
Information technology
Languages
Music
>
```

- `courses <location> <theme>` - The command prints all the courses and the number of enrollments of them in the location and theme in question *arranged alphabetically by the course name*, for example:

```
> courses Lempaala Exercise
Hiit --- 10 enrollments
Pilates --- 5 enrollments
Yoga --- 3 enrollments
>
```

Or, if the course is full, the output is as follows:

```
> courses Vesilahti "Information technology"
Excel --- full
>
```

Above example shows also that a parameter consisting of several words must be enclosed by quote marks. (Both theme and course are such parameters that can consist of several words.)

Even if a theme consists of only one word, it can be enclosed by quote marks. For example:

```
> courses Nokia "Dance"
Zumba --- 2 enrollments
>
```

Note that a theme can consist also of three or more words (not necessarily of one or two, as in this example). However, the code template provides the function `split_ignoring_quoted_delim` that can split parameters consisting of several words in a correct way. Therefore, you need not care about detecting quote marks at all.

- `available` - The command prints the themes, locations, and names of all those courses that are free to be enrolled in, i.e. that are not full. The output is a single *alphabetically ordered* list, where the list elements are firstly ordered by themes, secondly by locations, and thirdly by course names.

You will probably understand it best after this example:

---

```
> available
Cooking : Pirkkala : Christmas food
Dance : Nokia : Zumba
Dance : Vesilahti : Zumba
Exercise : Lempaala : Hiit
Exercise : Lempaala : Pilates
Exercise : Lempaala : Yoga
Exercise : Nokia : Hiit
Exercise : Vesilahti : Fitness boxing
Handcraft : Pirkkala : Weaving
Handcraft : Vesilahti : Dressmaking
Handcraft : Vesilahti : Hammering
Languages : Lempaala : English
Languages : Pirkkala : German
Languages : Vesilahti : English
Music : Pirkkala : Karaoke
Music : Vesilahti : Guitar
>
```

---

- `courses_in_theme <theme>` - The command prints all courses under the given theme in all locations. The locations are listed in alphabetical order and courses in the order, they have been listed in the input file, as follows:

---

```
> courses_in_theme Exercise
Lempaala : Hiit
Lempaala : Yoga
Lempaala : Pilates
Nokia : Hiit
Pirkkala : Hiit
Vesilahti : Fitness boxing
>
```

---

Again (as in the command `courses`), the theme parameter can consist of several words.

- `courses_in_location <location>` - The command prints all courses under all themes in the given location. The courses are listed in alphabetical order as follows:

---

```
> courses_in_location Lempaala
English
Hammering
Hiit
Karaoke
Pilates
Yoga
>
```

---

- `favorite_theme` - The command prints the most popular theme. The number of enrollments in each theme are summed together, and this maximum number and the theme (or themes in alphabetical order) with this amount of enrollments are printed. For example:

---

```
> favorite_theme
116 enrollments in themes
--- Handcraft
>
```

---

The command assumes that if a course is full, it has 50 enrollments.

Let's look at an additional example on the case where there are the same maximum number of enrollments in several themes. If the content of the input file was:

---

```
Languages;English;Lempaala;14
Handcraft;Weaving;Pirkkala;2
Handcraft;Hammering;Vesilahti;12
Exercise;Pilates;Lempaala;5
Exercise;Yoga;Lempaala;3
```

---

the command would print:

---

```
> favorite_theme
14 enrollments in themes
--- Handcraft
--- Languages
>
```

---

If the input file is not empty, there is a theme that is the most popular one. In the case of an empty input file, the command prints:

---

```
> favorite_theme
No enrollments
>
```

---

- `cancel <kurssi>` - The command cancels the given course in all locations. For example:

---

```
> cancel English
English cancelled in all locations
> available
Cooking : Pirkkala : Christmas food
Dance : Nokia : Zumba
Dance : Vesilahti : Zumba
Exercise : Lempaala : Hiit
Exercise : Lempaala : Pilates
Exercise : Lempaala : Yoga
Exercise : Nokia : Hiit
Exercise : Vesilahti : Fitness boxing
Handcraft : Pirkkala : Weaving
Handcraft : Vesilahti : Dressmaking
Handcraft : Vesilahti : Hammering
Languages : Pirkkala : German
Music : Pirkkala : Karaoke
Music : Vesilahti : Guitar
```

---

By giving the command `available`, it is possible to see that English course is no more available in Lempäälä nor in Vesilahti (as they were in the previous print of `available` command). In implementing the command, you need not care about the situation that a theme can become "empty", if all its courses are cancelled.

Also in this command, the name of the course can consist of several words.

---

After completing the user's command, the program prints the prompt once again. It will continue printing the prompt until the user gives the command `quit`.

## Errors

If the user input has an error, the program prints the relevant error message, and after that, returns to waiting for user input. In other words, the execution of the program does not end if the user input contains errors.

After the user gives an unknown command, the program prints the following error message:

---

```
> something
Error: Unknown command: something
> some_command parameter
Error: Unknown command: some_command
>
```

---

If the user gives the command the wrong amount of parameters, the program prints the error message `Error: error in command <command>` as follows:

---

```
> courses Lempaala
Error: error in command courses
>
```

---

The command `courses` has two separate error messages. If the program cannot find the location the user has provided, it prints the error message `Error: unknown location`, and if it cannot find the given theme, it prints the error message `Error: unknown theme`. For example:

---

```
> courses some_location Exercise
Error: unknown location
> courses Lempaala some_theme
Error: unknown theme
> courses some_location some_theme
Error: unknown theme
>
```

---

If both the location and the theme are unknown, the program informs only about an unknown theme, as shown in last case above.

Note that the error message is printed although both the location and theme exist, but if the given location provides no courses in the given theme. In the command `favorite_theme`, you can see an input file with five lines, where `Pirkkala` has no exercise courses at all. In such case, the program prints:

---

```
> courses Pirkkala Exercise
Error: unknown location
>
```

---

For the command `courses_in_theme`, it is possible to give a theme that cannot be found. Then, the program prints the following error message:

---

```
> courses_in_theme some_theme
Error: unknown theme
>
```

---

Similarly, for the command `courses_in_location`, it is possible to give a location that cannot be found. Then, the program prints the following error message:

---

```
> courses_in_location some_location
Error: unknown location
>
```

---

Moreover, for the command `cancel`, it is possible to give a course that cannot be found. Then, the program prints the following error message:

---

```
> cancel some_course
Error: unknown course
>
```

---