

VE 280 Lab 4

Out: 12:00 June 9th, 2021 **Due:** 23:59 June 16th, 2021

Background:

Haruhi enjoyed watching *Attack on Titan* together with Kyon. However, she got quite upset about the last chapter and believed that she could produce a much better work than Isayama Hajime. The cultural festival was just around the corner, so she decided to call up the members of SOS brigade and produce her own short movie *The Adventures of Mikuru Asahina Episode 00*.

This short movie is mainly about the war between Asahina Mikuru, a cute girl from the future, and Nagato Yuki, a silent, expressionless and inhospitable alien girl.

- They need **1 costume for Mikuru, 2 guns and 100 bullets** for each scene.
- `Yamazaki's Model Shop` sells bullets and guns, and `Omori's Costume Store` sells costumes.

Ex1. How Many Scenes Could They Produce?

Related Topics: *exceptions, program arguments*.

For Ex1, you are going to simulate the process of purchasing the needed materials for the movie. The following are some basic rules:

- They will first visit `Omori's Costume Store` and then `Yamazaki's Model Shop`. If `Yamazaki's Model Shop` is open, they will first buy guns and then buy bullets. During the procedure, if any "exception" happens (eg: `Omori's Costume Store` is closed, bullets in `Yamazaki's Model Shop` are not enough, etc), the buying process will end (exception caught). See `ex1.cpp` for details.

- The input will be a sequence of numbers read from **program arguments** (6 numbers in total):

number of scenes (int)

- status of `Omori's Costume Store` (1 for open and 0 for closed)
- status of `Yamazaki's Model Shop` (1 for open and 0 for closed),
- number of costumes remaining in `Omori's Costume Store` (int)
- number of guns remaining in `Yamazaki's Model Shop` (int)
- number of bullets remaining in `Yamazaki's Model Shop` (int)

For example, if the program name is `ex1` and the arguments are "`3 1 1 10 5 355`", i.e. ,

```
./ex1 3 1 1 10 5 355
```

then they will make 3 scenes, both stores are open, 10 costumes remain in `Omori's Costume Store`, 5 guns and 355 bullets remain in `Yamazaki's Model Shop`.

- Part of the program has already been implemented. Your work is to complete the program by filling the parts marked with `TODO`. Please **do not change** any code that is already written. See `ex1.cpp` for further instructions.
- Output is Kyon's thoughts in his mind. Sample output for above example:

We visit Omori's Costume Store first...
We've bought enough costumes! I can't wait before Miss Asahina wears them! Then we visit Yamazaki's Model Shop...
Guns in Yamazaki's Model Shop are not enough. We still need 1 more.
We have to wait longer before we get started. Fortunately, Miss Asahina can have more peaceful days.

Ex2. Which Bullet Should They Buy?

Related Topics: *IO, compound objects, program arguments.*

Different types of bullets are put in different types of boxes, with different prices. The number of bullets in different boxes may not be equal. Koizumi wanted to find the type of bullet with the best cost performance (the lower, the better). Please write a program to help him. Cost performance is calculated by $\text{total cost} / \text{number of bullets}$

In this exercise, you are going to read a file which contains all the price information for different kinds of bullets.

In each line, they have the same format:

```
<type name (string ,no space)> <price (double)> <number of bullets (int)>
```

Here is an example:

```
variety1 56.81 40  
variety2 59.50 50  
variety3 79.28 70
```

The number of lines of this file is not fixed.

The **name of the file is not fixed** as well. In your lab materials, an example file named `price_list.txt` is provided. However, in some test cases, the name of the file could be different. You need to read the name of the file from **program argument**:

```
./ex2 <file_name>
```

The following are the requirements:

- Name your file as `ex2.cpp`.
- Make sure to use `file streams` to read the file and `structs` to contain the information.
- Output: Print the information of all of the bullet varieties with the best cost performance into stdout. The format and sequence (if there are two or more) should be the same as the input file.

Example output for above file:

```
variety3 79.28 70
```

- For consistency, you can assume that all the `price` numbers in the file have 2 decimal places. In your output, the `price` and should have 2 decimal places as well.

Ex3. Guest list

Related Topics: *I/O*.

Haruhi's new movie was on. A great many otakus were attracted to watch it. Kyon was asked to collect the names of audiences watching that movie. But he found that currently the collection of the names was a mess like this.

```
Taniguchi ,Kunikida , Sakaki,Yamane , Nakashima, Arakawa
```

Names were English letters, no space inside, separated by commas and spaces, but sometimes there are too many spaces between a name and a comma and sometimes there's no space. Only 1 comma can appear between 2 names, but **the number of spaces and the number of names are not fixed**. He wanted to make a name list using the original name collection and the exact number of people.

Please write your code in a file named `ex3.cpp`. Here are the requirements:

- Input: See above for an example.
- Output: Output the list of guest names followed by the number of guests. Example:

```
Taniguchi
Kunikida
Sakaki
Yamane
Nakashima
Arakawa
6
```

The order of the names should be **the same** as in the input message. Each name or the number occupies one line.