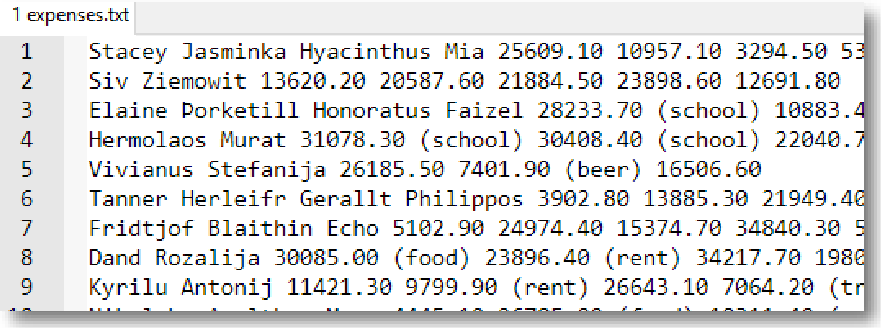
Homework 12

The Expenses Filter

Here is a portion of a text file with the expenses for the members of your Pokémon commune where every day is an adventure.



```
Stacey Jasminka Hyacinthus Mia 25609.10 10957.10 3294.50 53
Siv Ziemowit 13620.20 20587.60 21884.50 23898.60 12691.80
Elaine Porketill Honoratus Faizel 28233.70 (school) 10883.4
Hermolaos Murat 31078.30 (school) 30408.40 (school) 22040.7
Vivianus Stefanija 26185.50 7401.90 (beer) 16506.60
Tanner Herleifr Gerallt Philippos 3902.80 13885.30 21949.40
Fridtjof Blaithin Echo 5102.90 24974.40 15374.70 34840.30 5
Dand Rozalija 30085.00 (food) 23896.40 (rent) 34217.70 1980
Kyrilu Antonij 11421.30 9799.90 (rent) 26643.10 7064.20 (tr
```

You are the secretary and the accountant has asked for a list of each member, along with the expenses they have incurred.

> *Write a filter function named* **`expense`** *that reads the text file above (using standard input and redirection) and produces a new file that contains each member's name followed by a comma and the member's expenses formatted to two decimals. In addition, any duplicate spaces in the person's name should be reduced to one space.*

Because this is a filter, you program will read from **`cin`** and write to **`cout`**.

1. First Draft

Here's a first draft.

- → Include the `<iostream>`, `<iomanip>` and `<cctype>` headers
- → Add the basic, unformatted I/O pattern to the function
- → Test the function with `make test`

The function simply echoes every character input to output; the same **echo filter** presented in the chapter.

2. Printing the name

You'll notice that every person's name **has a different number of characters**. The requirements are for the program to print the name followed by a comma, and, to remove any duplicate spaces. So, how do we tell when a name is finished, and it is OK to print a comma?

- **When the next character to be read is a digit!**

First, you need to change the overall outer loop to use `cin.peek()` to look at the next character (before you read it). This method returns the constant `EOF` when it runs out of data and so you'll need to change the bounds condition to handle that.

Next, you'll need **two loops** inside the outer loop: one to process the name and one to process the numbers. These are not nested, but one after another.

The first loop is handled most easily as a **loop-and-a-half endless** loop. Inside:

1. Read the character from the stream using `cin.get()`
2. If it is a space and the **next character** is a space, then go back to step 1.
3. If the next character **is a digit** then leave the loop with a `break`.
4. Finally, print the character you read

After the loop, print a comma, followed by a space. If you get stuck, ask on Piazza or come to my office hours.

3. Reading Numbers

The second loop will sum the expenses on one line.

1. Create a `total` variable initialized to `0.0` **before** the loop
2. The `while` loop bounds: when the **next character** is a newline.
3. If next character is **a digit**, read with `>>` and add it to `total`

4. If the next character not a digit, just **read it and ignore it**.

After the loop, print the total with two decimal places. Then, read the newline and print it to go to the next person in the club.

You should be able to pass all tests at this point, and submit your assignment using **`make submit`**. If you have difficulty, please ask for help on Piazza or come to my office hours, which you'll find on the syllabus.