Energy Informatics

https://proglang.informatik.uni-freiburg.de/teaching/energy-informatics/2018ws/

Exercise Sheet 4 − Sequences and loops

2018-11-7

Exercise 1 (Simple loops)

- A palindrome is a sequence of characters which reads the same backward or forward, such as madam or 10101. Write a function that recognizes a palindrome. The function should accept a single input parameter and returns True if the input parameter is a palindrome, and False otherwise.

- Write a function that reverses a string (or list). The function should accept a single input parameter (string or a list) and returns the reversed input as a list.

Exercise 2 (Cooking recipes)

Given a list recipes with recipes, as follows:

```
recipes = [("Sushi", ["fish", "rice", "nori"]),
           ("Sashimi", ["fish", "rice"]),
           ("Pancakes", ["flour", "egg", "milk"]),
           ("Burger", ["bun", "beef"]),
           ("Burger TS", ["bun", "beef", "tomato", "salad"]),
           ("Cheese Burger", ["bun", "beef", "tomato", "cheese"]),
           ("Mixed Salad", ["salad", "tomato", "cucumber"])]
```

Write a function `cookable` which takes a list of ingredients (each ingredient is a string) and return all recipes that can be cooked with these ingredients. For example:

```
>>> cookable (["bun", "tomato", "cucumber", "salad", "beef", "bun"])
["Burger", "Burger TS", "Mixed Salad"]
>>> cookable (["fish", "rice", "tomato"])
[ "Sashimi"]
```

Exercise 3 (Movie database)

The file `movie.csv`[1] contains the top 100 most profitable movies. The first three rows are shown below. Domestic indicates the gross income in USA. Gross is in millions of $.

Rank	Title	Studio	Total Gross	Domestic	Overseas	Year
1	Avatar	Fox	"2,788.00"	760.5	"2,027.50"	2009
2	Titanic	Par.	"2,186.80"	658.7	"1,528.10"	1997
3	Star Wars: The Force Awakens	BV	"2,068.20"	936.7	"1,131.60"	2015

Load the csv file in python using `csv.DictReader` from the csv module[2].

1. What is the proportion of domestic and overseas gross income in the top 100?

2. Print the list of companies, sorted by gross income.

3. Compute the gross income per year. Is there a correlation? Do you have enough data to conclude?

Propose other questions to ask on this dataset.

(Bonus) How would you compute the most profitable movie genre? Try to install the IMDdPy[3] package (with `pip`, for example: `pip install IMDbPy`) and use it to fetch its genre.

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[1]Source: https://spreadsheets-to-programs.github.io/

[2]https://docs.python.org/3/library/csv.html

[3]https://imdbpy.sourceforge.io/