Tutorial 5

1. a) Using Pandas, read in the file `hospital.csv` as a Data Frame.

   b) Read in `hospital_extra_column.csv`, combine this and the previous data frame with `merge`.

   c) Read in `hospital_extra_row.csv`, combine this and the previous data frame with `concat`.

   d) Add a new columns describing the weight loss or gain over the course of the hospital stay.

   e) Produce a table of summary statistics with `describe`.

   f) Using `groupby`, find the mean weight loss or gain for males and for females. Using `groupby`, find the mean weight loss or gain for patients with physical injuries and for patients with medical problems.

   g) Combining `groupby` and `value_counts`, find the number of patients of each sex that have physical or medical problems.

   h) What percentage of patients were over 70 years old?

   i) Create a new data frame with only patients under 70 years of age. What was the mean length of stay for patients under 70 years of age?

   j) Pandas has a useful command to reshape data called `melt`. Look up this command in the Pandas online documentation, and see if you can use it to produce the following data frame:

	Name	variable	value
0	Alun Adams	Sex	M
1	Bleddyn Bowen	Sex	M
2	Christopher Clwyd	Sex	M
3	Daniel Derwen	Sex	M
4	Eifion Evans	Sex	M
...	...	...	...
235	Pamela Potts	Weight After	70.06
236	Quinlan Queltch	Weight After	77.12
237	Ulysses Underhill	Weight After	82.12
238	Victor Vallance	Weight After	72.42
239	Rosa Roberts	Weight After	74.13

240 rows × 3 columns

2. (a) Using Pandas, read in the file `houses.csv` as a Data Frame.

   (b) Find the median house price for each town.

   (c) Find the mean house price for each town, according to the house's size.

   (d) 80% of houses listed are at least what distance from a church?

   (e) Create a new column indicating if a house if less than 4 miles from a school.

   (f) Find the mean house price for houses less than, and for houses greater than 4 miles from a school.

   (g) I am looking for a Medium sized house, less than 2 miles from a school with a budget of $£130,000$. How many options do I have?