ECMM455 Python Worksheet 8: File input/output

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1   Aims

- Practice reading and writing text files

2   File input/output

There are various functions and methods available to open/read/write/close files with Python. To work with a file, the first step is to use the *open()* function to create a file object (either to read or to write).

- *open()*

  - Opens a file and creates a file object
  - Different flags: 'r' – read, 'w' – write
  - Usage: *f = open(filename, 'r')*

When a file object has been created, there are several methods that can be applied to carry out input/output operations. Make sure the method is suitable for the type of file object that was created (e.g. applying a write method to a file object created with the 'r' flag will cause an error). Some useful methods:

- *read()*

  - Reads the entire file as a single string
  - Usage: *f.read()*

- *readline()*

  - Reads the next single line of a text file (i.e. reads as far as '\n')
  - Returns line as a string, gives an empty string for end of file
  - Usage: *f.readline()*

- *readlines()*

  - Reads all lines in a text file (using '\n' as the delimiter)
  - Returns a list of strings
  - Usage: *f.readlines()*

- *write()*

  - Writes a string to a file (all data must be converted to a string to be written)

– Usage: *f.write('this text will be written')*

- *close()*

    – Closes an open file object

    – Usage: *f.close()*

3 Further reading

The material in this worksheet is covered in Chapter 14 of *Think Python*.

4 Exercises

1. Write a program called *upper_case.py* to read a text file and write the contents into a new file, all in upper case. [Hint: You may need to create a simple text file first.]

2. Write a program to count the number of times the word "happy" appears in the lyrics to the Pharrell Williams song of the same name. [The lyrics are given in *wksht8_happy.txt* in the *data_files* folder on the ELE page.]

3. Alter the previous program to also sort the lyrics into two output files – one file for lines including "happy", another file for every other line.

4. Alter *upper_case.py* so that it prompts the user for the name of a file to open and for the name to give the output file. Save your new program under a new filename.

5. Write a program to prompt the user for a word and then count how many times it appears in *War and Peace* by Tolstoy. The text for *War and Peace* is given in *wksht8_war_and_peace.txt* in the *data_files* folder on the ELE page.