Exercise of Programming Language, Quiz E2

Write 6 Python programs to solve the following questions. Please name your program files as *Q1.py*, *Q2.py*, and so on, *i.e.*, according to the serial number of questions. All data files you need can be obtained from the e3 system. Submit your programs to e3 before the end of the quiz.

1. Sort the lines in file *animals.txt* in descend order (from greatest to least) and print the results on the screen. Your output should look like this:

```
Woody Cowboy Human
Tigger Tiger
Sulley Monster
Simba Lion
Pluto Dog
... etc ...
```

2. Given a list,

```
numbers = [164.9, 150.3, 148.7, 189.2, 160.0, 174.3, 154.2, 201.6, 184.9, 182.1, 179.4, 193.8]
```

   Please write a program to calculate these values,
   (1) The minimum. (2) The maximum. (3) The average. (4) The median.

   Hint: Your program shall be applicable even if the number of elements in the list changed in the future. For instance, if numbers = [1, 3, 9], the median is 3; if numbers = [1, 3, 4, 9], the median is 3.5.

3. There are two numbers *x* and *y* saved in the first and second line respectively in the file *xy.txt*. Write a program to read this file obtaining the value of x and y, and then calculate and print out the results of the following formula,

   (1) C_y^x (2) P_y^x

4. A secret bee decided to live in a garden full of flowers. When this bee collected pollen from a flower, the flower would die immediately. In the first day, this bee collected pollen from half of the flowers in the garden. On the way home, it decided to collect pollen from two more flowers. Next day, the bee collected pollen from half of the remaining flowers again, as well as from two additional ones on the way home. After repeating this behavior for 11 days, in the morning of the 12th day, the bee found that there was only one flower left. How many flowers were there in the garden before the bee started collecting pollen.

5. Given an integer *n* in your Python program, use "loop" to make a graph of *n* lines in the style shown below,

Value	n = 1	n = 2	n = 3

Figure	`**`	`*--*`
		`****`
			`*----*`
			`**--**`
			`******`

Please print the graph to the screen and also save it as a text file in the *output* folder.

6. Here is a fractional sequence: $\frac{5}{3}, \frac{13}{7}, \frac{33}{15}, \frac{81}{35}, \frac{197}{83}, \frac{477}{199}, \frac{1153}{479}, \ldots$

What is the sum of the first 20 fractions of this sequence? (Hint: $\frac{a_{(t)}}{b_{(t)}} = \frac{2a_{(t-1)}+b_{(t-1)}}{a_{(t-1)}+2}$)