

Computer Simulation 1: Homework 1 Assignments 1,2 and 3

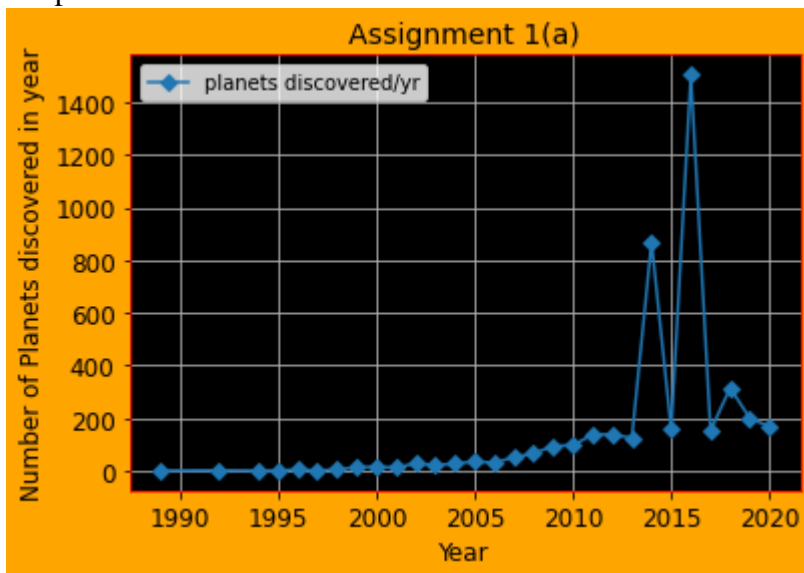
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HW 1: Assignment 1 (age of discovery)

(a): Below is a graph of the Year of planet discovery vs the number of planets discovered in said year. The code used to generate this can be seen in the corresponding notebook for homework 1, assignment 1. The most fruitful year of exoplanet discovery was 2017 as seen below.

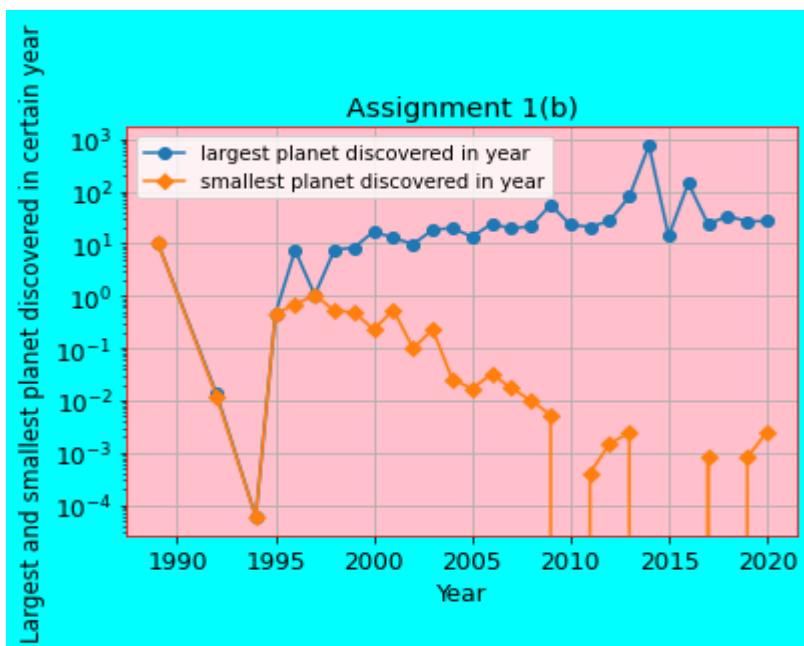
Output:



(b):

This presents of graph of the largest and smallest planet discovered per year. Note that in years where only one value was discovered, this value corresponds to both the max and min for that year, hence the 3 identical points at the beginning of the graph. Relevant code is detailed in the notebook

Output:



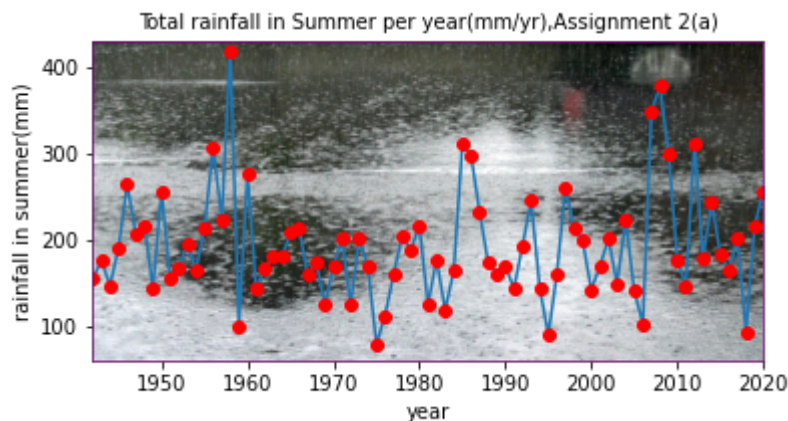
HW 1: Assignment 2(Irish Summers)

(a): In part (a) I was tasked with graphing total summer rainfall as a function of year and printing the year with the wettest summer and the year with the driest summer. Below are the requested values, see code for more details. I have also included a picture of rainfall as the background for this graph to gauge if this adds or detracts from the value of my graph.

Output:

The wettest summer was 1958

The driest summer was 1975

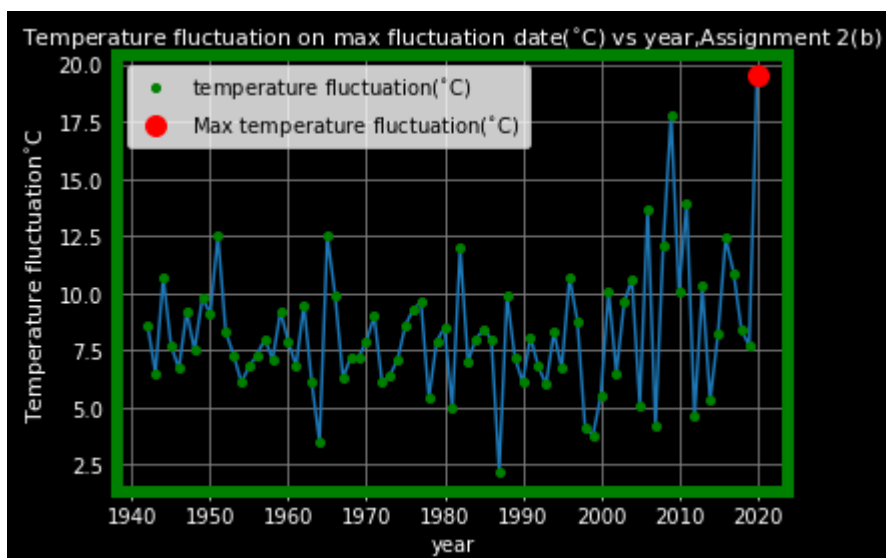


(b): In this part I was tasked with analysing the weather data to find the single day with the greatest fluctuation in temperature and to then graph fluctuation on this specific day vs year. Below is the output of the code in the corresponding notebook.

Output:

19.5 degrees Celsius = max fluctuation

[2] / [6] / [2020] = date of max fluctuation



HW 1: Assignment 3(Big Cities)

(a): Part (a) of this assignment requires a list of the 10 most populous cities in china and their corresponding populations. Below is said list(see code for further details).

Output:

```
Population ||Chinese City
-----
14987000   || Shanghai
11106000   || Beijing
8829000    || Guangzhou
7581000    || Shenzhen
7243000    || Wuhan
7180000    || Tianjin
6461000    || Chongqing
4787000    || Shenyang
4528000    || Dongguan
4123000    || Chengdu
```

(b): This part required a list of the 5 countries with the most cities in their database. America seems to have an abnormally high amount of cities, however, this seems to correspond to the data in the csv file upon scrolling through it by eye. Below is the output(see further details in the corresponding notebook).

```
('USA', 7327) USA= America
('RUS', 564)  RUS= Russia
('CHN', 392)  CHN= China
('BRA', 387)  BRA= Brazil
('CAN', 249)  CAN= Canada
```

(c): This part requires a histogram showing the breakdown of city sizes for the country with the most cities which in our case is the USA or America. Below is the output for the code(see notebook for more details). As can be seen there are many areas with a low population and much less cities with a more notable population which makes sense. People are concentrated in certain hubs in the country and spread out more sparsely across the rest of it.

