

# Matplotlib Challenge - Pymaceuticals

Matplotlib - The Power of Plots

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## Disclaimer:

Some of the code has been discussed with the instruction team and peers considering the challenges and to find best solution to the problem.

General websites have been referred for code accuracy including [matplotlib.org](https://matplotlib.org), [geekforgeeks.com](https://www.geekforgeeks.com), [stackoverflow.com](https://stackoverflow.com)

## Background:

This activity is to utilize Python Matplotlib and apply it to a real-world situation and dataset:

Pymaceuticals Inc., a burgeoning pharmaceutical company based out of San Diego. Pymaceuticals specializes in anti-cancer pharmaceuticals. In its most recent efforts, it began screening for potential treatments for squamous cell carcinoma (SCC), a commonly occurring form of skin cancer.

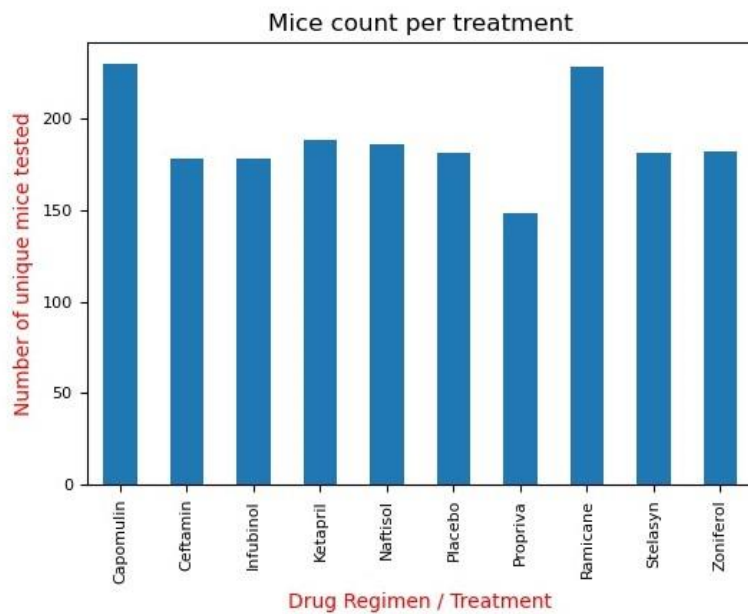
As a senior data analyst at the company, you've been given access to the complete data from their most recent animal study. In this study, 249 mice identified with SCC tumor growth were treated through a variety of drug regimens. Over the course of 45 days, tumor development was observed and measured. The purpose of this study was to compare the performance of Pymaceuticals' drug of interest, Capomulin, versus the other treatment regimens. You have been tasked by the executive team to generate all of the tables and figures needed for the technical report of the study. The executive team also has asked for a top-level summary of the study results.

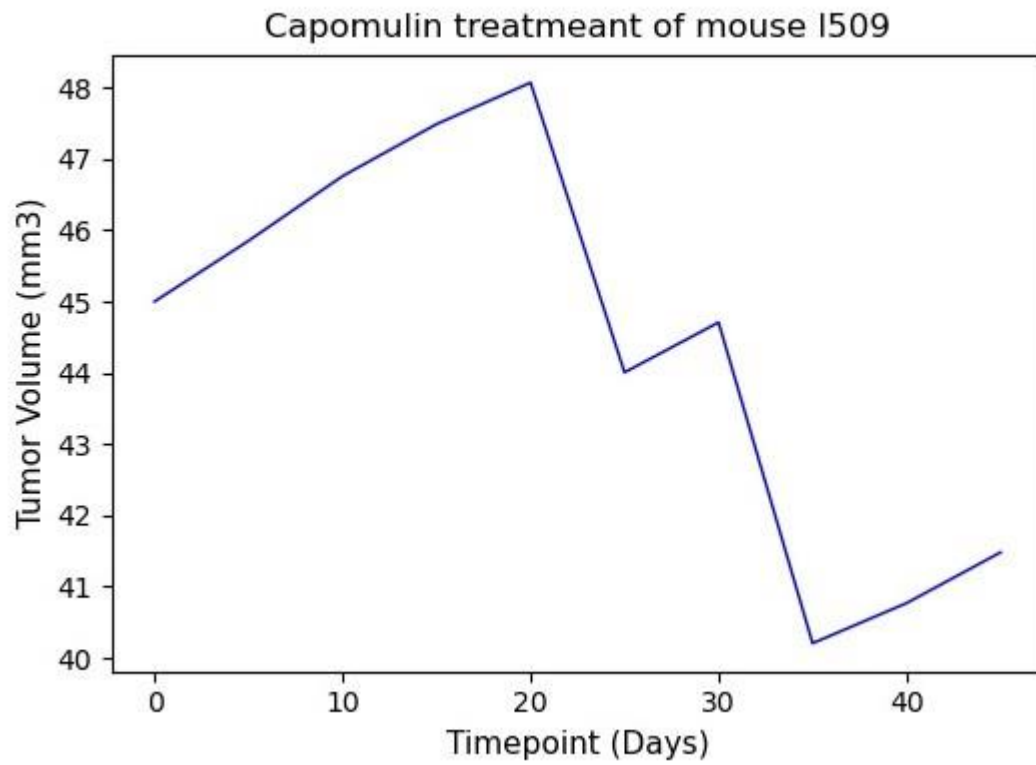
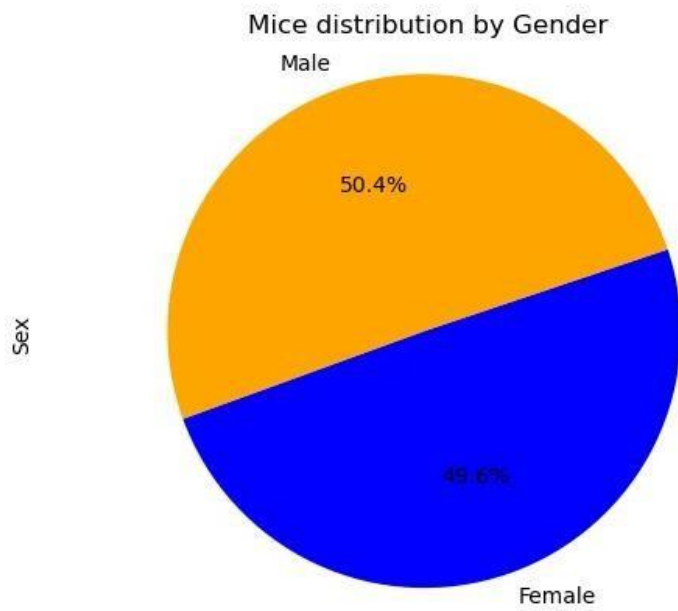
## Observations:

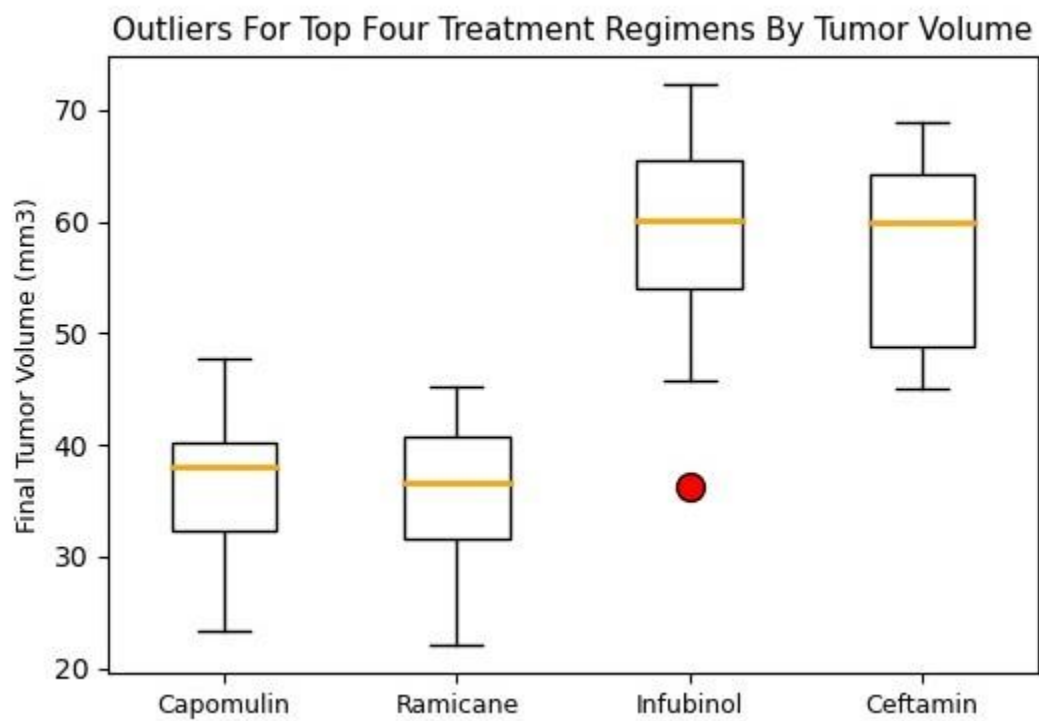
Main purpose of this analysis was to show how 4 selected treatments compare.

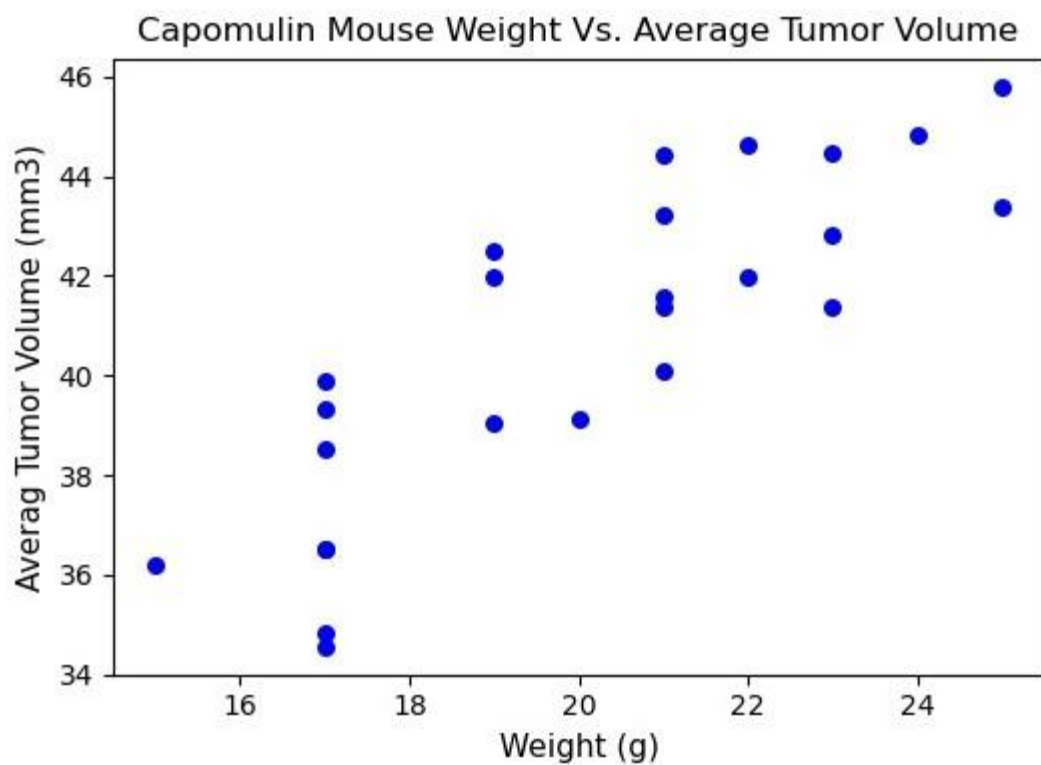
- \* Capomulin and Ramicane reduces the size of tumors better than other drug regimens.
- \* The correlation between mouse weight and average tumor volume is 0.84. It indicates a strong positive correlation, when the mouse weight increases the average tumor volume also increases.
- \* The regression analysis demonstrates, how much the average tumor volume will change when weight of mice changes. The R-squared value is 0.70, which means 70% the model fit the data so it is a good fit for prediction.
- \* One potential outlier has been observed within the Infubinol regimen. Most mice showed tumor volume increase, however one mouse has shown a reduction in tumor growth.

	mean	median	var	std	sem
Drug_Regimen					
Capomulin	40.675741	41.557809	24.947764	4.994774	0.329346
Ceftamin	52.591172	51.776157	39.290177	6.268188	0.469821
Infubinol	52.884795	51.820584	43.128684	6.567243	0.492236
Ketapril	55.235638	53.698743	68.553577	8.279709	0.603860
Naftisol	54.331565	52.509285	66.173479	8.134708	0.596466
Placebo	54.033581	52.288934	61.168083	7.821003	0.581331
Propriva	52.320930	50.446266	43.852013	6.622085	0.544332
Ramicane	40.216745	40.673236	23.486704	4.846308	0.320955
Stelasyn	54.233149	52.431737	59.450562	7.710419	0.573111
Zoniferol	53.236507	51.818479	48.533355	6.966589	0.516398









Linear Regression of Mouse Weight Vs. Average Tumor Volume

