**Summary of the study results -Pymaceuticals**

The study was based on 249 mice that were detected with tumour growth and treated through a variety of drug regimens. The time to observe and measure the tumour growth was 45 days. In this analysis we compared the performance of Pymaceuticals' drug of interest, Capomulin, versus the other treatment regimens and found the following results :

The **bar graph** shows that mice treated with drug regimen Capomulin had a higher number as compared to other drug regimens and the drug Propriva has the lowest number of mice.

The **pie chart** shows the gender distribution of the drug regimen is 50.6% for males and 49.4% for females.

The **box diagram** shows the tumour volume and the drug regimen. We can see that the treatment with both Capomulin and Ramicane shows positive results in decreasing the size of the tumour.

The **line graph** shows that the selected drug Capomulin helped in reducing the size of the tumour over a period of 45 days.

The **scatter diagram** shows that the average tumour volume increases when there in an increase in the weight of the mouse.

The **correlation coefficient** between mouse weight, and average tumour volume is 0.84.This is a positive correlation..

For **linear regression model**, the R-squared value is 0.70, which means 70% the model fit the data. R- Squared is the difference in outcome explained by the model. In this case we want to know the difference in different drugs on tumour. Some drugs are more effective than the others. The average tumour volume is a dependent variable and will change when the independent variable changes and that is the weight of the mice.

**Quartiles and Outliers**

**Capomulin**

The lower quartile of drug regimen Capomulin is: 32.37735684

The upper quartile of drug regimen Capomulin is: 40.1592203

The interquartile range of t drug regimen Capomulin is: 7.781863460000004

The median of drug regimen Capomulin is: 37.31184577

Values below 20.70456164999999 could be outliers.

Values above 51.83201549 could be outliers.

**Ramicane**

The lower quartile of drug regimen Ramicane is: 30.981175224999998

The upper quartile of drug regimen Ramicane is: 38.508305307499995

The interquartile range of drug regimen Ramicane is: 7.527130082499998

The median of drug regimen Ramicane is: 34.848627300000004

Values below 19.690480101250003 could be outliers.

Values above 49.79900043124999 could be outliers.

**Infubinol**

The lower quartile of drug regimen Infubinol is: 62.75445141

The upper quartile of drug regimen Infubinol is: 67.68556862

The interquartile range of drug regimen Infubinol is: 4.9311172099999965

The median of drug regimen Infubinol is: 66.08306589

Values below 55.35777559500001 could be outliers.

Values above 75.08224443499999 could be outliers.

**Ceftamin**

The lower quartile of drug regimen Ceftamin is: 61.43389223

The upper quartile of drug regimen Ceftamin is: 67.52748237

The interquartile range of drug regimen Ceftamin is: 6.093590140000003

The median of drug regimen Ceftamin is: 64.29983003

Values below 52.29350701999999 could be outliers.

Values above 76.66786758 could be outliers.

**Summary statistics for Capomulin, Ramicane, Infubinol, Ceftamin**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Drug Regimen** | **Mean** | **Median** | **Variance** | **Standard Deviation** | **SEM** |
| 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 |
| Ramicane | 40.216745 | 40.673236 | 23.486704 | 4.846308 | 0.320955 |