**Chapter 4**

*Presentation of Data, Analysis and Correlation*

**Presentation of Data**

The data for rainfall amounts were collected from the PAGASA weather station located in Baguio City. Rainfall amounts are measured manually using a rain gauge. A rain gauge is an apparatus used to measure the amount of precipitation for a certain period of time. A rain gauge has an outer cylinder, a measuring tube inside, and a funnel on the top. In PAGASA, data gathering is done every after three hours starting from two in the morning until eleven in the evening. The data obtained by the researchers were simplified and classified monthly every year. The data obtained were ranges from January 2001 until September 2012.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2001 | 2001 |  | 2002 | 2002 |
| **Month** | **Total RF (mm.)** |  | **Month** | **Total RF (mm.)** |
| **JANUARY** | 14.6 |  | **JANUARY** | 5 |
| **FEBRUARY** | 39.5 |  | **FEBRUARY** | 2 |
| **MARCH** | 289.8 |  | **MARCH** | 0.6 |
| **APRIL** | 76 |  | **APRIL** | 71.2 |
| **MAY** | 291 |  | **MAY** | 264.4 |
| **JUNE** | 451.4 |  | **JUNE** | 411 |
| **JULY** | 1642 |  | **JULY** | 1883.4 |
| **AUGUST** | 274 |  | **AUGUST** | 525.6 |
| **SEPTEMBER** | 842.2 |  | **SEPTEMBER** | 301.5 |
| **OCTOBER** | 97 |  | **OCTOBER** | 224.8 |
| **NOVEMBER** | 61.6 |  | **NOVEMBER** | 67.3 |
| **DECEMBER** | 23.2 |  | **DECEMBER** | 10 |
|  |  |  |  |  |
|  |  |  |  |  |
| 2003 | 2003 |  | 2004 | 2004 |
| **Month** | **Total RF (mm.)** |  | **Month** | **Total RF (mm.)** |
| **JANUARY** | T |  | **JANUARY** | 17 |
| **FEBRUARY** | 25.4 |  | **FEBRUARY** | 128.6 |
| **MARCH** | 4.8 |  | **MARCH** | T |
| **APRIL** | 46.8 |  | **APRIL** | 37.8 |
| **MAY** | 662.7 |  | **MAY** | 428.6 |
| **JUNE** | 792.4 |  | **JUNE** | 1306.5 |
| **JULY** | 721.3 |  | **JULY** | 445.4 |
| **AUGUST** | 1089.4 |  | **AUGUST** | 1432.9 |
| **SEPTEMBER** | 303.2 |  | **SEPTEMBER** | 225.6 |
| **OCTOBER** | 179.7 |  | **OCTOBER** | 42.4 |
| **NOVEMBER** | 60.4 |  | **NOVEMBER** | 114.5 |
| **DECEMBER** | 4.4 |  | **DECEMBER** | 154.9 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2005 |  |  | 2006 |  |
| **Month** | **Total RF (mm.)** |  | **Month** | **Total RF (mm.)** |
| **JANUARY** | 0.2 |  | **JANUARY** | 160.6 |
| **FEBRUARY** | 0 |  | **FEBRUARY** | 8.8 |
| **MARCH** | 54.6 |  | **MARCH** | 38.4 |
| **APRIL** | 32 |  | **APRIL** | 29.6 |
| **MAY** | 291 |  | **MAY** | -- |
| **JUNE** | 425.7 |  | **JUNE** | 188.2 |
| **JULY** | 292.4 |  | **JULY** | 1769.8 |
| **AUGUST** | 690.2 |  | **AUGUST** | 735.8 |
| **SEPTEMBER** | 694.6 |  | **SEPTEMBER** | 207.6 |
| **OCTOBER** | 256.6 |  | **OCTOBER** | 316 |
| **NOVEMBER** | 55.2 |  | **NOVEMBER** | 72.4 |
| **DECEMBER** | 68 |  | **DECEMBER** | 43.2 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2007 |  |  | 2008 |  |
| **Month** | **Total RF (mm.)** |  | **Month** | **Total RF (mm.)** |
| **JANUARY** | 0 |  | **JANUARY** | 24 |
| **FEBRUARY** | 0.6 |  | **FEBRUARY** | 97 |
| **MARCH** | 31.8 |  | **MARCH** | 78.7 |
| **APRIL** | 25.4 |  | **APRIL** | 149.8 |
| **MAY** | 308.6 |  | **MAY** | 839.8 |
| **JUNE** | 358.4 |  | **JUNE** | 302 |
| **JULY** | 219 |  | **JULY** | 681.2 |
| **AUGUST** | 1201.6 |  | **AUGUST** | 999.5 |
| **SEPTEMBER** | 408.4 |  | **SEPTEMBER** | 761 |
| **OCTOBER** | 410.3 |  | **OCTOBER** | 178.1 |
| **NOVEMBER** | 444.8 |  | **NOVEMBER** | 82.6 |
| **DECEMBER** | 21.6 |  | **DECEMBER** | 0 |
|  |  |  |  |  |
|  |  |  |  |  |
| 2009 |  |  | 2010 |  |
| **Month** | **Total RF (mm.)** |  | **Month** | **Total RF (mm.)** |
| **JANUARY** | 8 |  | **JANUARY** | T |
| **FEBRUARY** | 64.5 |  | **FEBRUARY** | T |
| **MARCH** | 82.9 |  | **MARCH** | 15.3 |
| **APRIL** | 407.3 |  | **APRIL** | 148.6 |
| **MAY** | 298.5 |  | **MAY** | 248.6 |
| **JUNE** | 810 |  | **JUNE** | 254 |
| **JULY** | 758.4 |  | **JULY** | 543.7 |
| **AUGUST** | 1087.7 |  | **AUGUST** | 536.6 |
| **SEPTEMBER** | 516.9 |  | **SEPTEMBER** | 296.8 |
| **OCTOBER** | 1981.8 |  | **OCTOBER** | 920.1 |
| **NOVEMBER** | 22.2 |  | **NOVEMBER** | 226.4 |
| **DECEMBER** | 0 |  | **DECEMBER** | 47.4 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2011 |  |  | 2012 |  |
| **Month** | **Total RF (mm.)** |  | **Month** | **Total RF (mm.)** |
| **JANUARY** | 94 |  | **JANUARY** | 17.5 |
| **FEBRUARY** | 13.8 |  | **FEBRUARY** | 80.3 |
| **MARCH** | 88.9 |  | **MARCH** | 151.9 |
| **APRIL** | 11.9 |  | **APRIL** | 72.6 |
| **MAY** | 462.5 |  | **MAY** | 207.7 |
| **JUNE** | 529.1 |  | **JUNE** | 659 |
| **JULY** | 435.9 |  | **JULY** | 1020.2 |
| **AUGUST** | 1096.3 |  | **AUGUST** | 2,207 |
| **SEPTEMBER** | 819.2 |  | **SEPTEMBER** | 288.3 |
| **OCTOBER** | 332.4 |  | **OCTOBER** | -- |
| **NOVEMBER** | 81.6 |  | **NOVEMBER** | -- |
| **DECEMBER** | 67.4 |  | **DECEMBER** | -- |

**Analysis**

Since the gathered data on the month of May 2006 were missing, the data from January 2001 until December 2005 were manipulated to predict the value of the total amount of rainfall for the month of May 2006, using the bootstrapping method.

|  |  |
| --- | --- |
| 2006 |  |
| **Month** | **Total RF (mm.)** |
| **JANUARY** | 160.6 |
| **FEBRUARY** | 8.8 |
| **MARCH** | 38.4 |
| **APRIL** | 29.6 |
| **MAY** | 376.5086 |
| **JUNE** | 188.2 |
| **JULY** | 1769.8 |
| **AUGUST** | 735.8 |
| **SEPTEMBER** | 207.6 |
| **OCTOBER** | 316 |
| **NOVEMBER** | 72.4 |
| **DECEMBER** | 43.2 |

Once the May 2006 data was acquired, the totality of the data from January 2001 to December 2011 was used to forecast the rainfall amounts for January 2012 to September 2012.

|  |  |
| --- | --- |
| 2012 | Point Forecast |
| January | 356.7386 |
| February | 356.7386 |
| March | 356.7386 |
| April | 356.7386 |
| May | 356.7386 |
| June | 356.7386 |
| July | 356.7386 |
| August | 356.7386 |
| September | 356.7386 |

Using the forecasted values, a t-test was used to check if there was a significant difference between the two.

According to the results acquired, there was no significant difference. The value acquired was compared to a value from the t-distribution table. The results prove that there was no significant difference.

**References**

* Student's t-Distribution [Internet]. WolframMathworld; cited 2012 Nov 14] .Available from: <http://mathworld.wolfram.com/Studentst-Distribution.html>
* Rain Gauge [Internet]. Colby College; cited 2013 Jan 23] . Available from: <http://www.colby.edu/cpse/equipment2/Weather/gauge.html>
* Student's t Distribution [Internet]:Stat Trek; [cited 2012 Nov 30] . Available from: http://stattrek.com/probability-distributions/t-distribution.aspx