

SESSION 1 2011/2012

SSCM 1033 : STATISTICS

LECTURER : DR ARIFAH BAHAR

GROUP MEMBER:

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**Introduction**

Statistics is the science of collection, organization, and interpretation of data. It deals with all aspects of this, including the planning of data collection in terms of the design of surveys and experiments. Statistics is closely related to probability theory, with which it is often grouped. Statistics is a discipline which is concerned with designing experiments and other data collection, summarizing information to aid understanding, drawing conclusions from data, and estimating the present or predicting the future. Therefore, in the process of making this assignment, we will use some statistics skill that we learnt before to complete this assignment.

Gold is used in dentistry as well as a drug to treat a small number of medical conditions. Injections of weak solution of sodium aurothioimalate or aurothioglucose are sometimes used to treat rheumatoid arthritis. Small amounts of gold are used to remedy a condition known as Lagophthalmos, which is an inability of a person to close their eyes completely. This condition is treated by implanting small amounts of gold in the upper eyelid. The implanted gold “weights” the eyelid and the force of gravity helps the eyelid close fully. Radioactive gold is used in diagnosis. It is injected in a colloidal solution that can be tracked as a beta emitter as it passes through the body. Many surgical instruments, electronic equipment and life-support devices are made using small amounts of gold. Gold is nonreactive in the instruments and is highly reliable in the electronic equipment and life-support devices

In this assignment, a data set is provided which contain days after Injection and serum gold % concentration. The 100 set of data is given. In this data set, days after injection has been from 1 day until 7 days; whereby the serum gold % concentration has been from 23.1% to 93.8%. All groups of the data will be random pick by using Microsoft Excel through computer .This kind of randomly choose can make us get the accurate value and easier in doing this assignment. Thus, by sing suitable method that we learnt, we can analyze the data with perfectly and completely this assignment.

Data Analysis

# 25 random numbers of data on the serum gold concentration from the e-learning website-SSCM1103-XX



Standard Deviation for Sy: 14.28066842

Standard Deviation for Sx : 1.78605711

Correlation : -0.959

The Slope,b1 = r

= -7.67

The intercept,bo = 91.00

The Linear Regression Model

y = m x + c a straight line equation

ŷ = bo + b1x

Substitute the value that calculated inside the linear equation

Serum Gold % Concentration = 91.00 – 7.67 ( Days after Injection )

The significance of linear relationship

Sum of error = ∑ Ɛo = ŷ- bo + b1x= 0.00

Graph of serum gold % concentration and days after injection

**The validity of the assumption**

**1. Linearity Assumption**

The Straight Enough Condition is satisfied if scatterplot looks straight.

**2. Independence Assumption**

The errors in the true underlying regression model must be mutually independent

**3. Equal Variance Assumption**

The variability of y should be about the same for all values of x.

**4. Normal Population Assumption**

We need this assumption so that we can use a Student’s t-model for inference.

**The ways to tackle nonlinearity**

When the nonlinearity exists, we have many ways to tackle. The first way is we have to logarithm all the data for serum gold concentrations found in randomly sampled blood taken from patient and the days after injection. Log10 x and log10y. The second way is we can use reciprocal method for the data for serum gold concentrations found in randomly sampled blood taken from patient and the days after injection. 1/x and 1/y.

**CONCLUSION**

This data samples we take 25 uniform random numbers from E-learning website(SSCM1103).From the result of our assignment get from the question, the data show that the relationship between radioactive gold(195Au-aurothiomalate) and its’ length of time it retained in a person’s body is linear.

Furthermore, we know how to use the technology tool such as Microsoft EXCEL to draw scatter plot, ANOVA table, and regression line which can save our time in calculation and also double check our assignment so it is really more efficient.

After all, we can learn a lot of teamwork skills. All group members must co-operate and communication well with each other to share out the work respectively. We also have discussed the assignment together to get the correct answer. Attendance for meetings also important to make sure that all group members must be punctual and this teaches us to be more discipline.

Sometimes, there were many different opinions in our discussion because of that we have learn how to tolerate each other and get the best answer and solution for our assignment group.

**Appendix**

**Meeting :** No.1

**Date :** 15/12/2011

**Day :** Thursday

**Time :** 3.00p.m - 5.00p.m

**Venue :** C08-413

**Attendance :**

1. Lok Wai Kit
2. Yeo Pei Wah
3. Wong Lit Cheng
4. Chong Juhn Yung
5. Aryna Izzati Zahari
6. Muhammad Hanif Khairuddin
7. Nurul Atiras Emyra Mohd Zukry

**Minutes :**

1. Our leader let us to read all the task in the assignment sheet.
2. We go through all the assessments.
3. We discussed how to use computer to pick out a random data.
4. We also discussed about validity assumption.
5. We noticed that our work cannot be smooth without computer.
6. So ,we decided to have next meeting on the tonight.
7. Our leader asked us to bring laptop in next meeting.
8. The meeting dismissed.

**Meeting :** No.2

**Date :**15/12/2011

**Day :**Thursday

**Time :**8.00p.m-10.00p.m

**Venue :**Kolej Tun Razak’s Hall

**Attendance :**

1. Lok Wai Kit
2. Yeo Pei Wah
3. Wong Lit Cheng
4. Chong Juhn Yung
5. Aryna Izzati Zahari
6. Muhammad Hanif Khairuddin
7. Nurul Atiras Emyra Mohd Zukry

**Minutes :**

1. We greeted everybody and started our discussion.
2. We picked out the data used Microsoft Office Excel.
3. We estimated the value of intercept,b0 and the slope,b1 using least squares.
4. Everybody gave idea and their full co-operation.
5. Then ,our leader want us to find out the linear regression model ,significance of linear relationship ,validity of assumption and how to tackle nonlinearity.
6. In our next meeting ,we will discuss more about them.
7. Meeting dismissed.

**Meeting :** No.3

**Date :**20/12/2011

**Day :**Tuesday

**Time :**10.00a.m-12.00a.m

**Venue :**C08-413

**Attendance :**

1. Lok Wai Kit
2. Yeo Pei Wah
3. Wong Lit Cheng
4. Chong Juhn Yung
5. Aryna Izzati Zahari
6. Muhammad Hanif Khairuddin
7. Nurul Atiras Emyra Mohd Zukry

**Minutes :**

1. We gathered together and started our third meeting.
2. We continued our last discussion.
3. We discussed more on significance of linear relationship ,validity of assumption and how to tackle nonlinearity.
4. Everyone tried to give their opinion.
5. We also asked our lecturer, Dr. Arifah Bahar cos have some confuses.
6. Her explanation make us more understand.
7. The meeting dismissed.

**Reference**

1. Richard D. De Veaux, Paul F. Velleman, David E. Bock (2009). *Intro Stats.* (3rd ed.) United States of America:Pearson
2. Fadhillah Yusof, Zalina Mohd Daud, Maizah Hura Ahmad, Robiah Adnan, Zarina Mohd Khalid, Arifah Bahar, Norhaiza Ahmad (2009), *Basic Statistics for Sciences and Education.* Malaysia:Pearson
3. <http://geology.com/minerals/gold/uses-of-gold.shtml>
4. <http://www.stat.yale.edu/Courses/1997-98/101/linreg.htm>