ETERNITY: FUNCTIONS : Logarithm Function $Log_b(X)$

Sahana Anantha

SOEN-6011 SOFTWARE ENGINEERING PROCESS

Concordia University

Agenda:

- Introduction
- Critical Decision taken in Project
- Source Code Review
- Function Testing
- Learnings

Introduction

- A logarithmic answer the question " How many of this number do we multiply to get that number? "
  For Example: How many 2s must we multiply to get 8?

  $$Ans : 2 * 2 * 2$$

  So we had to multiply 3 of the 2s to get 8. We say the logarithm of 8 with base 2 is 3
  In fact, these two things are the same:

  $$2 * 2 * 2 \text{ is equivalent to } log_2(8) = 3$$

- **Definition**
  A logarithm is an exponent which indicates to what power a base must be raised to produce a given number. The logarithm of x in the base b is written $log_b(x)$ and is defined as,

  $$log_b(x) = y$$

  $$\text{if and only if } by = x, \text{ where } x > 0 \text{ and } b > 0, b \neq 1$$

  $$\text{logarithmic form : } log_b(x)$$

  $$\text{exponential form : } b^y = x$$

Domain

$$\text{Set of positive real numbers } x > 0$$

Co-Domain

$$\text{Set of real numbers R from } -\infty \text{ to } +\infty$$

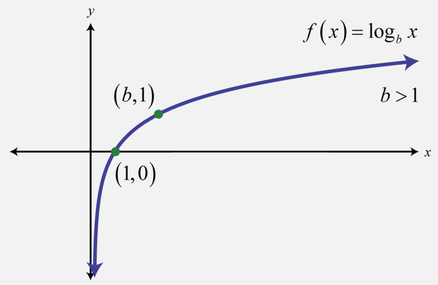

Figure: Graph of logarithmic function (Source: Google Images)

Critical Decision taken in Project

1. Choosing efficient algorithm was challenging task, which involved lot analysis on different aspects.
2. Deciding the approach to calculate the logarithmic function with different base values other than 10 and e was challenging job.
3. It was challenging to deal with precision values obtained from result, to round off to the nearest value.

Source Code Review

1. It helped me to learn more about the programming style used by other team member.
2. while doing the source code review, javadoc was useful to retrieve more information about the steps involved in the function.
3. I was able to review the source code manually to find the errors and compare the results obtained with automated tools.
4. It helped me to understand the perceptive of reviewer as how the analysis is performed on source code so that as a developer it can be corrected.

Function Testing

1. I learnt how to perform the testing using junit test cases written by other team member and verify the same with requirement specification.
2. It gave me a chance to explore more on testing framework used.
3. It helped me to analysis different hidden scenarios apart from the written test cases.

Learnings

1. From this project, i gained knowledge on different kinds of tools namely latex which is mainly used for documentation, Check Style for checking the programming style and PMD for source code analysis.
2. It helped to explore more on mathematical function without the use of built-in libraries.
3. It gave me a chance to take part in different roles of software process
4. Learnt how to design the function and based on the requirements.

Acknowledgement

Special thanks to Prof Pankaj Kamthan for the guidance.