Concordia University

SOEN 6011 - Software Engineering Process

ETERNITY: FUNCTION
ab^x

Deliverable 1

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https://github.com/avneet-kaur/SOEN-6011

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1 Introduction

An exponential function is a function with the general form ab^x, $a \neq 0$, b is a positive real number and $b \neq 1$ .In an exponential function, a is constant, the base b is a constant, and the exponent x is a real variable.

1.1 Domain

- The domain is all Real numbers.
  $-\infty < x < +\infty$, $x \in R$

1.2 Co-Domain

- $For\ b > 0$, range is $[0, \infty)$ where $b \in R$ and $x \in R$.
- $For\ b = 0$ and $y = 0$, range is 1 and $For\ b = 0$ and $x > 0$, range is 0.
- $For\ b < 0$, range is $(-\infty, \infty)$ where $b \in R$ and $x \in Z$.

1.3 Characteristic

- **Exponential growth** : In the function f(x) = b^x when $b > 1$, the function represents exponential growth. In figure 1, it is evident on the left side.
- **Exponential decay** : In the function f(x) = b^x when $0 < b < 1$, the function represents exponential decay. In figure 1, it is evident on the right side.
- **Commutativity**: Exponential function is not commutative which means $x^y \neq y^x$ for $x \neq y$. For example, $0^1 = 0$ and $1^0 = 1$.

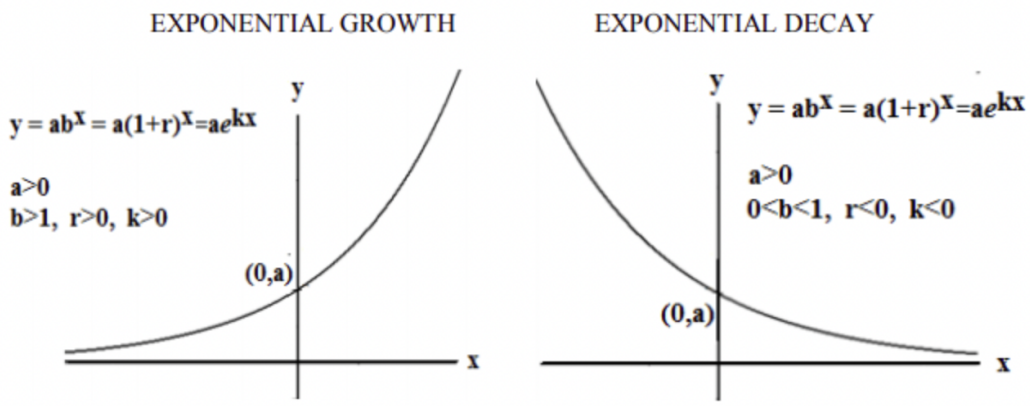

Figure 1: Exponential Growth and Exponential Decay

2 Functional Requirement

2.1 Assumptions

2.2 Requirements

3 Algorithm

3.1 Description

3.2 Advantages and Disadvantages