SOEN 6011 : SOFTWARE ENGINEERING PROCESSES
SUMMER 2022

Eternity

PROBLEM - 2

Requirements

ISO/IEC/IEEE 29148 Standard

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Contents

1 PROBLEM 2 - F6: $B(x, y)$

1.1 Assumption:

To compute the value of the Beta function, we can estimate the value of the definite integral using numerical methods.

1.2 Requirements:

The current section describes the requirements to implement the function $B(x, y)$.

1.2.1 Requirement Id : R1

Id	R1
Overview	$B(x, y)$, where x, y $\in R, x, y > 0$.
Version	1.0
Description	The Beta function can give output only if both x, y values entered by user are positive real numbers.
Priority	High
Type	Functional
Difficulty	High
Verification	UserInput_numericInputCheckTest_1

1.2.2 Requirement Id : R2

Id	R2
Overview	$\mathrm{B}(x, y) = \int_0^1 t^{x-1}(1-t)^{y-1}\, dt$
Version	1.0
Description	To compute the value of Beta function for any real number we need to be able to compute definite integral as defined in the mathematical realm of calculus.
Priority	High
Type	Functional
Difficulty level	Medium
Verification	Integral_testBetaFunctionWithDoubleValues_2

1.2.3 Requirement Id : R3

Id	R3
Overview	To calculate Beta function, exponent function A^B is required.
Version	1.0
Description	To calculate the Beta function, a subordinate function needs to be used to calculate the value A raised to the power B.
Priority	High
Type	Functional
Difficulty level	Medium
Verification	Exponent_positiveNumberPowerofPositiveNumber_3

1.2.4 Requirement Id : R4

Id	R4
Overview	Accuracy
Version	1.0
Description	To accurately compute the value of Beta function, for large inputs of x and y, we need to have the ability to store large numbers.
Priority	High
Type	Non-Functional
Difficulty level	Medium

1.2.5 Requirement Id : R5

Id	R5
Overview	Scalable
Version	1.0
Description	The method used to calculate the Beta function, should be scalable for different input values and hardware requirements.
Priority	High
Type	Functional
Difficulty level	Medium

1.2.6 Requirement Id : R6

Id	R6
Overview	Performance
Version	1.0
Description	The method used for the Beta function, should be optimized for performance so that if efficiently calculates the integral for large inputs values.
Priority	High
Type	Functional
Difficulty level	Medium

1.2.7 Requirement Id : R7

Id	R7
Overview	Usability
Version	1.0
Description	The command Line Interface is user friendly, guiding the user step by step how to move about. Error messages are understandable. The application is easy to use and friendly.
Priority	High
Type	Functional
Difficulty level	Easy

2 Annexure:

- **Trello Board :** *https://trello.com/eternity119*
- **Code Version Control :** *https://github.com/neonapinto/Scientific_calculator*
- **Overleaf :** *https://www.overleaf.com/project/62e938922b3937446fb7f547*

References

[1] ReqView : Nykamp DQ: Requirements Specification Templates
`https://www.reqview.com/doc/iso-iec-ieee-29148-templates`

[2] 29148-2018-ISO/IEC/IEEE International Standard-Systems and software engineering-Life cycle processes-Requirements engineering,
`https://standards.ieee.org/standard/29148-2018.html`