

CONCORDIA UNIVERSITY

DELIVERABLE 1

ETERNITY:NUMBERS

(Gaussian Integral)

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Abstract

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The project deals with creating the calculator which will calculate the Eternity: Number and use it in the real time application of the number .In this project the calculator will have all the basic functionality with the additional scope added to it

1 Distributed Version Control System Used

The distributed version control system used for this project is Github . I have been uploading my project various parts at various stages on github. the link for my github for this project is :-
[https : //github.com/ankur27aggarwal/SOEN6481.git](https://github.com/ankur27aggarwal/SOEN6481.git)

2 Criteria for the selection of the user stories for ETERNITY:NUMBERS

2.1 What are a User Stories :-

User stories are short, simple descriptions of a feature told from the perspective of the person who desires the new capability, usually a user or customer of the system. They typically follow a simple template. User stories are often written on index cards or sticky notes, stored in a shoe box, and arranged on walls or tables to facilitate planning and discussion. As such, they strongly shift the focus from writing about features to discussing them. In fact, these discussions are more important than whatever text is written.

User stories are written throughout the agile project. Usually a story-writing workshop is held near the start of the agile project. Everyone on the team participates with the goal of creating a product backlog that fully describes the functionality to be added over the course of the project or a three- to six-month release cycle within it.

2.2 User Stories for the Eternity:Number calculator :-

The user stories for the Eternity:Number calculator will be based on the persona and the use case diagram submitted in the Problem 3 and Problem 5 in deliverable 1. The user stories will have the 6 key points : 1 :-

Identifier

2 :- User story Statement

3 :- constraint

4 :- Acceptance criteria

5 :- Priority

6 :- Estimate

2.3 User Stories Estimate calculation :-

The fibonacci sequence is used by Scrum teams for story point estimates – 1, 2, 3, 5, 8, 13, 21, and so on. Teams use this sequence, rather than a linear 1 – 10 as it forces them to provide a relative estimate. Easier to ask ‘is that a 5 or an 8?’ than ‘is that a 6 or a 7?’.

In the case of our we are taking 1 as the highest and followed by other numbers in ascending order .

2.4 User Stories from Previous delevierable:-

The different use cases used in the last delevierable are as followed ;-

- 1 . Calculator
- 2 . Eternity Number Operation
- 3 . Arithmetic Operation
- 4 . Command
- 5 . Interpreter
- 6 . Stack
- 7 . Calculator
- 8 . Accept
- 9 . Pixel Adjuster
- 10 . Signal Normalizer

User story -1

Identifier :- Gaussian integral

User story Statement :- As a user , I want the value of Gaussian Integral to be returned , so that I can use it to for further computations.

Acceptance criteria :-

- 1 Integral of the Gaussian function e^{-x^2} over the entire real line .
 - 2 Value from user with in specified range
-

Priority :- high

Estimate :- 2

User story -2

Identifier :- storage

User story Statement :- As a user , I want the value of Gussian Inegral to be stored as history, so that I can use it to for appropriate approximation in computations and for future look ups .

Acceptance criteria :-
1 Previous values
2 At maximum 5 values

Priority :- high

Estimate :- 3

User story -3

Identifier :- arithmetic no

User story Statement :- As a global constant , I want calculator to perform the basic arithmetic caalculations , so that I can use it to for computations.

Acceptance criteria :-
1 Basic arithmetic calculation
2 (+,-,/) operations

Priority :- high

Estimate :- 5

User story -4

Identifier :- decimal point

User story Statement :- As a user , I want the value of Gussian Inegral to be returned upto 3 digit of decimal places, so that I can use it to for appropriate approximation in computations.

Acceptance criteria :-

1 After decimal the number of digits must be three

Priority :- Medium

Estimate :- 8

User story -5

Identifier :- polynomial expression

User story Statement :- As from other Articulation , I want the value of Gaussian Inegral's exponential power in the form of polynomial expression to be solved by calculator , so that I can use it to for easy computations.

Acceptance criteria :-

- 1 Value that make whole expression in the form of $(a+b)^2$
 - 2 Value which can be taken as constant out of integral
-

Priority :- Very low

Estimate :- 13

User story -6

Identifier :- scititific calculation

User story Statement :- From polynomial extression , I want the calculator to solve problems in science, engineering, and mathematics. , so that I can use it to for extended application calculation .

Acceptance criteria :-

- 1 Calculation of sin
 - 2 Calculation of Cos
 - 3 Engineering calculations
-

Priority :- Medium

Estimate :- 21

User story -7

Identifier :- undo operation

User story Statement :- As a user , I want the calculator to have undo operation, so that I can use it to reset the storage.

Acceptance criteria :-

1 Must make the latest or selected value 0 and rewrite it .

Priority :- Medium

Estimate :- 34

User story -8

Identifier :- Interpreter

User story Statement :- As a user , I want the calculator to have interpreter , so that I can use it to access specific value in the storage.

Acceptance criteria :-

1 Must return the selected value or the location of selected value .

Priority :- Medium

Estimate :- 55

User story -9

Identifier :- Pixel adjuster

User story Statement :- As a user , I want the calculator to normalize the given value of pixel , so that I can use it to render the object .

Acceptance criteria :-

! Average value of pixel having value 1 for the selected region to make the edges round in image

Priority :- Medium

Estimate :- 89

User story -10

Identifier :- Signal normalizer

User story Statement :- As a user , I want the calculator to normalize the signal distribution , so that I can use the normalized value to plot the sine and cosine graph.

Acceptance criteria :-

! Average value of signals having value (1,0,-1) for the selected range to make the sine wave form to send the signals

Priority :- Medium

Efficiency 144

User story -11

Identifier :- mean

User story Statement :- From the application pixel adjuster and signal normalizer , I want the calculator to calculate mean , so that I can use it to normalize data.

Acceptance criteria :-
1 Number with in range
2 average of the range

Priority :- High

Estimate :- 233

User story -12

Identifier :- Error function

User story Statement :- As a user , I want the calculator to calculate error function for finite limits of integral , so that I can use it for vector computations .

Acceptance criteria :-

1 A random variable Y that is normally distributed with mean 0 and variance 0.5

Priority :- Medium

Estimate :- 377

User story -13

Identifier :- Integral

User story Statement :-From the application pixel adjuster and signal normalizer , I want the calculator to calculate integration of finite , so that I can use it to compute further data .

Acceptance criteria :-

- 1 Basic rules of Integration
 - 2 Definite or Indefinite integrals .
-

Priority :- Medium

Estimate :- 610

User story -14

Identifier :- Rand mean

User story Statement :-From the application pixel adjuster and signal normalizer , I want the calculator to calculate Rand mean , so that I can use it for approximate generation random factor distortion .

Acceptance criteria :-

1 Average of the values

2 Numbers should be in the range given by user .

Priority :- Medium

Estimate :- 987

User story -15

Identifier :- Variance

User story Statement :-From the error function use case

Acceptance criteria :-

1 Square of user given mean that is calculator should as which mean rand mean or normal mean

2 Value should be in range

Priority Low

Estimate :- 1597

3 Backward traceability matrix for Gaussian Integral

3.1 What is traceability matrix :-

A Traceability Matrix is a document that co-relates any two-baseline documents that require a many-to-many relationship to check the completeness of the relationship. It is used to track the requirements and to check the current project requirements are met.

3.2 Types of Traceability Test Matrix :-

In Software Engineering, traceability matrix can be divided into three major component as mentioned below: **Forward traceability:** This matrix is used to check whether the project progresses in the desired direction and for the right product. It makes sure that each requirement is applied to the product and that each requirement is tested thoroughly. It maps requirements to test cases. **Backward or reverse traceability:** It is used to ensure whether the current product remains on the right track. The purpose behind this type of traceability is to verify that we are not expanding the scope of the project by adding code, design elements, test or other work that is not specified in the requirements. It maps test cases to requirements. **Bi-directional traceability (Forward+Backward):** This traceability matrix ensures that all requirements are covered by test cases. It analyzes the impact of a change in requirements affected by the Defect in a work product and vice versa.

3.3 Backward traceability matrix for Gaussian Integral :-

Business Requirement	Use Case	Interviewee	Global	Applications	User Stories
Gaussian integral	Eternity Number Operation	*			
storage	Stack	*			
arithmetic no	Arithmetic,Operation	*	*		
decimal point		*			
polynomial expression					
scientific calculation			*		polynomial expression
undo operation	Stack	*			storage
Interpreter	Interpreter				
Pixel adjuster		*			
Signal normalizer		*			
mean				*	
Error function		*			
Integral				*	
Rand mean				*	
variance				*	Error Fuction

Table 1: Table 1 of the Tracebility Matrix

Business Requirement	Persona	Articulation	Survey
Gaussian integral	*		
storage	*		
arithmetic no	*	*	
decimal point	*		
polynomial expression		*	
scientific calculation		*	
undo operation	*		
Interpreter			
Pixel adjuster	*		
Signal normalizer	*		
mean			
Error function			
Integral			
Rand Mean			
variance			

Table 2: Table 2 of the Treacibility Matrix

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