Enternity:Numbers

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SOEN6481:Software Systems Requirements Specification

Function : Natural Logarithm of 2 i.e ln_e2

What was planned to be implemented for the current Iteration?

- Maintaining user's session history.
- Displaying the result of user computation.
- Allow User to view their computation history of the current session.
- Performing basic arithematic operation i.e. add, multiplication,subtraction,division on two user enetered numbers.
- Calculating Natural Logarithm Properties i.e. Quotient Rule,Product Rule,Power Rule on a user enetered number with ln_e2.
- Compute the result of ln_e2.
- Compute the result of natural logarithm of user enetered number.
- Compute total time required to double initial priniciple when interest rate is compunded annually.
- Compute total time required to double initial priniciple when interest rate is compunded continously.
- Compute the inverse funtion of ln_e2.

What happened in the current Iteration?

- All planned task completed.
- To maintain user history a re-sizeable array ie. arrayList was used.
- The calculator built was a text based calculator.

Any critical decisions made?

- Making a surrogate user for the project to add a famous real world application of ln_e2 i.e. "Computing half life of a substance" to the Enternity:Numbers which was found by introspection.

  Why was this decision critical?
  - It is a very famous problem and commonly used concept in nuclear physics and chemistry.Adding this feature to calculator would be make it more meaningful and relevant to new groups of user community- physicists and chemists.However this feature was not added to the list of planned task of iteration 1.
- Making the calculator a text based calculator and not a UI based for the iteration 1.

  Why was this decision critical?
  - The reason to make the calculator a text based calculator was to give a basic workable version of a Enternity:Number in iteration 1 to the user community without getting involved in different technologies and frameworks.The decision was critical as it was tradeoff between expected functionality that the calculator is supposed to offer versus the visual appeal of the calculator. I chose to build a text based calculator.
- Converting a real user to a surrogate user a change that was made in Deliverable 2 from Deliverable1.

  Why was this decision critical?
  - The decision was critical because the real user had no goals and expectation from Enternity:Number and seemed content with the scientific calculators, available in market, for any computation related to ln_e2. Since the user was a student and was representing the student community as user for Enternity:Number so this user was converted to a surrogate user and relevant goals for instance computing natural logarithm properwere added to this newly created surrogate user.
- Result rounded to 2 or 3 decimal places only for this iteration.

  Why was this decision critical?
  - It restricts the user from getting result rounded upto a certain decimal place other than 2,3, 16(default). However I decided to output result of computation available upto 2,3,16 decimal places for iteration 1 because all the users whom I interviewed uses the result either rounded upto 2 decimal place or 3 decimal place.
- Added feature to perform basic arithematic operation on two number, on suggestion of TA.

  Why was this decision critical?
  - TA suggested to add a feature to perform arithematic operation (add,subtract,multiple,division) on two user entered numbers.By adding this feature in iteration 1 , these functions can be used as many underlying computational logic for many upcoming features of Enternity:Numbers for example "Computing Basic Arithmetic Operation of a number with lne2".Hence avoiding repeation of code logic.

What went well in the current Iteration?

- The result returned by computing the natural logarithm of number was giving a decent precision i.e the result of Enternity:Number matched with result of a scientific calculator upto 4 decimal places.For example:
  - Value of ln_e2 computed by Enternity:Numbers is 0.6931534304818241
  - Value of ln_e2 from scientific calcultaor Casio model : fx-991MS is 0.69314718
- User's session history was maintained for all computations with result being a Math Error or a valid result along with the user's command to Enternity:Numbers.
- User entered numbers for a given operation was always validated specially for negative numbers because natural logarithm of a negative number is invalid or Math Error.

What didnt go well in current Iteration and how can we improve ?

- Users are not given the flexibility to choose the precision of the result i.e upto what decimal place they would want to get the result to be rounded off.

  What can be done to improve this ?
  - Take input from the user about the decimal places they would want to round off the result to and any other input parameters if required by an operation.
  - Based on the input number of rounding off the result should save and returned upto that decimal place.
- Not giving user an option to clear their history of computation.

  What can be done to improve this ?
  - A new feature to be added to Enternity Numbers which will make the clearing history possible with a single click of the user.
- Converting the text based calculator to UI based calculator.

  What can be done to improve this ?
  - Use Java JFrames concepts to built a User Interface of Enternity:Number
- Testing was manual in this iteration and should be converted to automated testing.

  What can be done to improve this ?
  - Use Junit for automated testing.
- All scenario of possible exception were not handled in this iteration i.e any exception that is thrown in the source should throw a user understandable exception and not Java based exception.

  What can be done to improve this ?
  - Enhance exception handling ensuring all possible case exception cases are handled.

Action plan for next iteration

Below are top 3 task selected and they will be a part of the next iteration.Remaining Task will be added to Enternity:Numbers as a requirement and will be handled accordingly.These are selected as they bring in more user flexibility and make the Enternity:Numbers more robust.

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- Converting the text based calculator to UI based calculator.
- Testing was manual in this iteration and should be converted to automated testing.

Lessons Learnt:

- Benefits of automated testing over manual testing.
- More user interviews should be conducted to get more software requirement.

Reference

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