Small Group Activity - Design how to process values with units

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Activity Kind

Small group activity

Purpose

The purpose of this activity is to move forward with a solid design for how units should be integrated into the calculator now that you have a clearer understanding about all of the components.

Pre-requisite

Students are expected to have participated in:

- Small Group Activity - Risk assessment for the third and fourth week submissions

Tasking

Work with your small group to make out a scenario for one of the computations from the Hohmann Transfer document where units play an important role. As you perform the following, be sure to capture what you are doing and why in your ENB.

The first thing to recognize is if the units are proper (can be used without normalization) or compatible (can be used, but normalization will be required). If they are proper, the work is to perform the math and determine the resulting units. If the units are not proper, but they are compatible, normalization must first take place.

Consider the request to add 13.5 ± 0.0001 inches to 2.025 ± 0.001 feet. What should the calculator do? Clearly, it is **not proper** to just add the values, but feet and inches are compatible. Therefore, to add these two values together, we have to normalize them, so both are either feet or inches. (I would recommend selecting the smaller unit.)

Both operand1 and operand2 have a measured value, an error term, and a unit value. If the units of the operands are **proper** for a certain operator, do the computation, and use the unit that is appropriate for the result of this computation. If the operands are **not proper** for a certain operator, but they are compatible, normalize both operands, do the computation, and use the unit that is appropriate for the result of this computation as a result of the normalization.

What methods and glue code will be used to accomplish the above? Document your solution to the above in the form of UML Sequence Diagrams and any other UML Models as required to make the design clear.

Deliverable

Students are responsible for producing and posting their notes and their code in their ENB as evidence that they performed this task as required.

Submission

Each student must produce and submit your ENB for the day.