This project is different from all previous projects, you can choose to implement it with either Fortran or C. There is no "right" or "wrong" answers as long as the program functions as specified.

Your job is to design a RPN Calculator (Reverse Polish Notation) similar to the Classic HP-35 calculator. The basic arithmetic functions, add, sub, mul, div and enter will be implemented in class and will be available on the usc.class.ce108 newsgroup. Your grade will be determined by how many additional functions you can add, perhaps as many as 25.

The keywords for the commands are: enter (push on stack); + (add); - (subtract); * (multiply); / (divide); +/- (change sign); E (exponent); x<>y (exchange x and y); C (clear); sto (store); rcl (recall); pi (constant pi); sin (sine); cos (cosine); tan (tangent); asin (Arc Sine); acos (Arc Cosine); atan (Arc Tangent); inv (1/x); y**x (y^x); Ln (natural logarithm); log (logarithm with base 10); exp (e^x); sqr (\sqrt{x}).

In the following examples, assume \(x = 3.2, y = 5.6, z = 1.6\).

Example 1: The expression \(\sqrt{x^2 + y^2}\) can be calculated using the stroke sequence:

\[
3.2; \text{enter}; \ast; 5.6; \text{enter}; \ast; +; \text{sqr}
\]

Example 2: The expression \(e^{-3x} \cos 2y / \tan z\) can be calculated using the stroke sequence:

\[
3.2; 3; \ast; +/-; E; 5.6; 2; \ast; \cos; \ast; 1.6; \tan; /
\]

Example 3: The expression

\[
\frac{e^{xy} \sin \left(\frac{x}{y} + \frac{z}{2}\right)}{\log \left(\frac{\pi}{2} + \sqrt{x + y + z}\right)}
\]

can be calculated using the stroke sequence:

\[
\pi; 2; /; 3.2; \text{enter}; 5.6; +; 1.6; +; \text{sqr}; +; \text{Ln}; \text{sto}; 3.2; \text{enter}; 5.6; /; 1.6; \text{enter}; 2; /; +; \sin; 3.2; \text{enter}; 5.6; \ast; E; \ast; \text{rcl}; /
\]