

Supplemental S1: Links to live demos of PQtutor.

This document is supplemental material for “PQtutor, a quasi-intelligent tutoring system for quantitative problems in General Chemistry.” by K. Theis.

Below are links to live demos illustrating different features of PQtutor. They are live in the sense that they show progress in solving a problem, sometimes with user input provided in the input box. You can look at the information provided, and then press “go” to see how input, if any, leads to the next output. The document headings mirror those in the main manuscript.

User interface

<http://pqcalc.pythonanywhere.com/hw3.17a?course=5432> (worked example)

<http://pqcalc.pythonanywhere.com/hw3.17b?course=5432> (problem to be solved)

Feedback and Assessment

Pumps

Some of these features are also showcased in the S3 video

<http://pqcalc.pythonanywhere.com/hw3.17n?course=5432> (get started)

<http://pqcalc.pythonanywhere.com/hw3.17g?course=5432> (missed data from question)

<http://pqcalc.pythonanywhere.com/hw3.17k?course=5432> (prompt to define goals)

<http://pqcalc.pythonanywhere.com/hw3.17h?course=5432> (look up data)

<http://pqcalc.pythonanywhere.com/hw3.17i?course=5432> (intermediate step)

<http://pqcalc.pythonanywhere.com/hw3.17q?course=5432> (suggest to submit answer)

Corrective Feedback

Some of these features are also showcased in the S4 video

<http://pqcalc.pythonanywhere.com/hw3.17c?course=5432> (dimensions)

<http://pqcalc.pythonanywhere.com/hw3.17d?course=5432> (value)

<http://pqcalc.pythonanywhere.com/hw3.17e?course=5432> (sigfig)

<http://pqcalc.pythonanywhere.com/hw3.17f?course=5432> (name)

<http://pqcalc.pythonanywhere.com/hw3.17m?course=5432> (wrong formula)

<http://pqcalc.pythonanywhere.com/hw3.17j?course=5432> (spurious data)

Textbook integration

Adopting problems

<http://pqcalc.pythonanywhere.com/author> (form to author new questions)

<http://pqcalc.pythonanywhere.com/units3> (quantities and units up to chapter 3)

Dynamic textbook resources

<http://pqcalc.pythonanywhere.com/ico/studytools.html> (links to textbook resources)

More expressive output

<http://pqcalc.pythonanywhere.com/hw3.17v> (suggest to submit answer)

Using PQtutor in a course

Introduction to how the calculator works in PQtutor

<http://pqcalc.pythonanywhere.com/workedexampleCalculator>

Role of instructor

The following series of problems are an example of giving a lot of scaffolding initially, and then having additional problems with less and less scaffolding until the last problem where students start out with a blank page (because the scaffolding is removed starting with the end of the problem, it is called backwards fading):

<http://pqcalc.pythonanywhere.com/hw9.50a>

<http://pqcalc.pythonanywhere.com/hw9.51b>

<http://pqcalc.pythonanywhere.com/hw9.52b>