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xturtle - an extended turtle module for Python as a vehicle for teaching programming concepts

Wednesday, 5 July 2006 12:10 (30 minutes)

A new extended Tkinter based turtle module will be presented:

(1) Motives and pedagogical goals. (2) The design of the extended module. (3) The underlying architecture especially in respect of possible extensions and portings. (4) A set of sample scripts covering a wide range from elementary to rather sophisticated. (5) turtle graphics as a backbone for an introductory programming course/book.

Finally (6) a discussion will be initiated about the presented module as a starting point for a replacement for the existing turtle module of the Python standard distribution.

Summary

Turtle graphics is a valuable means for visualizing programming concepts. To use it for this purpose in introductory programming courses for kids (especially with Python) it has to meet a couple of requirements. Among these are the most important:

- very easy ('one command') interactive access to graphics output.
- intuitive as well as controllable display of turtle actions
- appealing and diversified possibilities of graphics output
- possibility to create eventdriven applications

All but the first one are met only poorly, if at all, by the current turtle module of the standard Python distribution.

- One more important aspect to be mentioned are the expectations of teachers/educators (especially those who are not primarily cs teachers) who not only have to teach but first to learn themselves to use the software, they want to use in their classes. Could an easy to use graphics module help to convince teachers to use Python?

As an alternative - which could well serve as a starting point for the development of a more useful turtle module - I propose the module xturtle.

In my talk I'll explain features and design-decisions, that facilitate the module's use in educational settings. I'll give a couple of examples ranging from 'very elementary' to 'highly sophisticated' thus showing that easy access to graphics furthers concentration on the respectively essential features of a programming problem. Here the high expressivity of Python comes in to arrive at amazingly compact solutions to relatively complex problems.

Moreover I'll give a rough sketch of how in an introductory programming course turtle graphics can be used as the main vehicle to visualize programming concepts.

Finally I'd like to discuss with the audience what are considered the most essential features of a useful turtle graphics module in order to merge the audience's ideas with what I've done up to now.

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