VISUALIZING MY LEARNINGS

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Problem

- Students are not able to analyze their own learning easily: strength and weaknesses

- Traditional Method: Compare with mean, median and standard deviation
Problem

- Syllabus / Learning goals are hard to visualize

<table>
<thead>
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<th>Topic 7 — Core: Calculus (continued)</th>
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<td><strong>Content</strong></td>
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| 7.4 Indefinite integration as anti-differentiation.  
Indefinite integral of $x^n$ ($n \neq -1$), $\sin x$, $\cos x$, $e^x$, $\frac{1}{x}$  
The composites of any of these with the linear function $ax + b$ | Indefinite integral interpreted as a family of curves.  
$\int \frac{1}{x} \, dx = \ln |x| + C$.  
Examples:  
$f'(x) = \cos (2x + 3) \Rightarrow f(x) = \frac{1}{2} \sin (2x + 3) + C$. | See SL guide |
| 7.5 Anti-differentiation with a boundary condition to determine the constant term.  
Definite integrals.  
Area between a curve and the x-axis or y-axis in a given interval, areas between curves.  
Volumes of revolution. | Example: if $\frac{dy}{dx} = 3x^2 + x$ and $y = 10$ when $x = 0$, then $y = x^2 + \frac{1}{2}x^2 + 10$.  
$\int_0^1 y \, dx$ and $\int_0^1 x \, dy$.  
Revolution about the x-axis or the y-axis.  
$V = \int_0^1 \pi y^2 \, dx$, $V = \int_0^1 \pi x^2 \, dy$. | See SL guide |
Prior work
Prior work: Khan Academy
Prior work: Khan Academy
Questions for users to explore

Analyze strengths and weaknesses
- How much did I improve from last time?
- How did I do compared to other students?

Study Prioritization
- How much time should I devote to studying each material? Where should I focus?
- What is the relationship between topics? Prerequisite?
Prototype and Sketches

Knowledge Map

- algebra
- arithmetic sequence
- infinite series
- geometric series
- sum of series
- read review
- function equation
- topic transition

Breakdown Analysis

- Time spent
- Topic: mean, median, mode
- Std:

Questions:

- Q1
- Q2
- Q3
- Q4
- Q5
- Q6
Prototype and Sketches

See How Your Skills Improve

- Art History
- Biology
- Chemistry
- Computer Science
- Physics

Start Date: [ ]
End Date: [ ]
Current Time: [ ]
Prototype and Sketches

See How Your Skills Improve

Start Date: ( )
Current Time: ( )
End Date: ( )
Feedback Questions

- How to create the best layout for prerequisite-tree-map? Other ways to organize the prerequisite or relationship between topics?

- What is a novel way to measure performance against other people? Is bar chart the simplest and most effective way to communicate?

- What else do you want to know about your learning skills?

- How to create a visualization that motivates students? (beside traditional recognition or award incentive)