UNIT GENERATORS

Building blocks for sound synthesis

Overview for the Week

• What's a Unit Generator?
• What are some unit generators in Nyquist?
• Unit Generator Implementation
• Functional Programming
• Wavetable Synthesis
• Scores in Nyquist
• Score Manipulation
What Is a Unit Generator?

- In the 50’s Max Mathews conceived of sound synthesis by software using networks of modules: “Unit Generators”
- UGs are “primitives” in a sound synthesis system
- They perform sound generation and sound processing

Unit Generator examples

- Oscillator
- Multiplier
- Envelope
Combining Unit Generators

- Unit Generators are Functions on sounds

\[ B(X, Y, Z) \]

Unit Generators in Nyquist
Some Basic Unit Generators

- osc(c4)
- pwl(0.03, 1, 0.8, 1, 1)
- osc(c4) * pwl(0.03, 1, 0.8, 1, 1)
- osc(c4) * osc(g4)

Evaluation

- Normally, SAL expressions evaluate their parameters, then apply the function: f(a, b)
- What about sounds?
  - To avoid storing huge values in memory,
  - Nyquist uses lazy evaluation
  - Samples are computed only when they are needed
  - Nyquist Sounds contain either samples or the potential to deliver samples, or some combination