CS 4100
Pascal Highlights

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Based on slides by Istvan Jonyer
Book by MacLennan

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Chapter 5:
Return to Simplicity: Pascal

- 1964 IBM: PL/I (Programming Language one) evolves to be a huge language
  - Union of Fortran, Algol and COBOL (rather than their intersection)
  - Swiss Army Knife Approach
  - Language is hard to use
    - Proponents say, enough to learn subset of PL/I
    - In reality, due to feature interaction, this is not possible
- Hard (or even futile) to design to design a language that is everything to all programmers

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Extensible Languages

- Another approach is to design a small 'kernel' language and make it extensible
  - Kernel provides basic functionality
  - Extensibility should please everyone

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Extensions: Operators

- Operator extension (vs overload)
  - Ability to create new operators
  - Example: symmetric difference of real numbers

```
operator 2 x # y;
  value x, y; real x, y;
  begin
   return abs(x − y)
  end
```

  - Allows:

```
if l # r > 0 then …
```

- C++ has operator overload, variation of this

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Extensions: Syntax

- *Syntax macros* allowed general syntax extension

```
real syntax sum from i = lb to ub of elem;
  value lb, ub;
  integer lb, ub, i; real elem;
  begin real s; s := 0;
   for i := lb step 1 until ub do
        s := s + elem;
   return s;
  end;
```

  - Allows:

```
total := sum from k = 1 to N of Wages[k];
```

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