

Ch1-7: CMPT140 Review

• *devo*

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CMPT14x
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Reminders:

- ***journals** in folder*

CMPT140 Review

- We've already covered one whole book!
 - Ch1: Problem-solving
 - Ch2: Your first program
 - Ch3: Program structure
 - Ch4: Procedures
 - Ch5: Enumerations, arrays, FOR
 - Ch6: Library modules
 - Ch7: Applications

Ch1: Problem solving

- Computing scientists as **toolsmiths**
- **Top-down** vs. bottom-up; **WADES**
- Client --> Designer --> Implementer
 - **Requirements** doc, **Design** spec, Code
- **VARI**ables and **CONST**ants
- Abstract data **types**
- **Atomic** vs. **aggregate** data types
- 5 **hardware** abstractions
- 5 **control/flow** abstractions

Ch2: A basic Modula-2 program

- Modules
 - Structure of a program module
 - IMPORTing library functions
 - Declaring variables, constants; initializing
 - ◆ Reserved words, identifiers
- Operators on basic types: +, -, *, /, DIV, ...
 - Comparison operators
 - BOOLEAN operators, shortcut
 - Precedence, type conversion
- Input/output on real, int/card, char, strings

Ch3: Basic Program Structure

- Statement **sequences**
- **Selection** (IF, ELSE, ELSIF)
- Repetition/**loops** (WHILE, REPEAT)
 - Top-of-loop vs. bottom-of-loop testing
- Boolean expressions

Ch4: Procedures

- Declaring procedures
- Procedure parameters:
 - Formal vs. actual parameters
 - Value vs. variable parameters
 - Scope
- Function procedures
 - RETURN
 - Use in expressions
 - (example)

Ch5: Types, Arrays, FOR

- User-defined types: the TYPE declaration
 - Atomic types
 - ◆ Scalar types
 - Real types (REAL, LONGREAL)
 - Ordinal types
 - Whole number types (INTEGER, CARDINAL)
 - Enumerations (5.2.1)
 - Subranges (5.2.2)
 - Structured (aggregate) types
 - ◆ Arrays (5.3)
 - Strings (5.3.1)
 - ◆ Sets (9.2-9.6)
 - ◆ Records (9.7-9.12)

Ch5: Types, Arrays, FOR

- What operations work on **ordinal** types?
 - Comparison, INC/DEC, ORD, index arrays, ...
- **Subranges**
 - Expression compat: base types match exactly
 - Assignment compat: base types assign compat
- **Arrays**
 - Open
 - Multidimensional
- **FOR**
 - vs. WHILE: pros/cons?

Ch6: Libraries

- M2 **Standard Library** modules:
 - I/O: `STextIO`, `SWholeIO`, `SRealIO`, `SLongIO`, `SIOResult`
 - ◆ Redirection: `channels`, `sink/source`, `RedirStdIO`
 - Math: `RealMath`, `LongMath`
 - Text: `Strings`
- Making your own **libraries**:
 - DEF vs. IMP
 - Information hiding
 - Accessor (set/get) functions

Ch7: Applications

- **Text** manipulation:
 - LENGTH, +, Concat/Append, Assign, Compare
- **PseudoRandom**:
 - Seed, iterative process
 - ◆ (Understand concepts enough to code it)
- **Fractions** ADT:
 - Set/get functions to hide `ARRAY[1..2] OF INT`
- **Substitution** cipher:
 - How it works

TODO items

- **Lab #6** today/tomorrow/Wed:
 - 7.14 #(22 / 32 / 37)
- 140 **Final** on Wed and Thu (two parts)
- **Homework** due Fri: 7.14 #(28, 31)
- No lab next week