Chapter 1
Introduction to computing

The purpose of this course:

- Basic knowledge of computers
- Basic knowledge of computer languages
- Scientific computing
- FORTRAN 90 programming

What is a computer?

Computer hard ware:

- CPU (central processing unit): control unit, arithmetic-logic unit, memory(registers). SPARC, IA64, X86, X64, IBM Cell etc.
- Memory: RAM(random access memory), ROM(read only memory), external memory (hard disk, CD, USB flash, etc).
- input/output devices

Computer software:

- machine language (binary strings consisting of opcode and address of operand.)
- assembling language
- high-level language (BASIC, FORTRAN, COBOL, C, Java, ...)

Operating system

- UNIX (Linux) system
- Windows
- Mac

A student needs a computer account at `sleet.lakeheadu.ca` for this course.

Ask TSC help desk for an account if you don't have one.

We will not have Lab this week. But each student should get an account at `sleet` this week.

Remote access protocols:

- ssh, putty
- sftp, WinSCP

Some UNIX commands:

- `passwd`
- `mkdir`
- `cd, ls`
- `rm, rmdir`
- `mv, cp`

Editors for programs:

- Notepad (windows)
- vi
- pico
- emacs

FORTRAN (Formula translation)

- The IBM Mathematical Formula Translating System, 1954-1957.
- FORTRAN 66, American Standards Association (now ANSI), 1966.
- FORTRAN 77, ANSI, 1977-1978.
- Fortran 90, ISO standard, 1991.
- Fortran 2003, 2008.

Fortran 90 compiler

- why do we need a compiler.
- FORTRAN compile command
- libraries
- link

Programming and problem solving

- Problem analysis and specification
- Program design
- Program implementation (coding)
- testing
- Program maintenance