ENGG1003 - Monday Week 12

The C programming language & version control with Git

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Lecture overview

1. Context
   - ENGG1003
   - what is C?
   - do we even need C?

2. C programming language
   - features and philosophy
   - key language details of C

3. version control with Git
   - principles
   - practical demonstration (live demo by Brenton)

1) Context

- Recall from last week. . .

- $\leq$ 2020, ENGG1003 used *MATLAB* and *C*
  - **from 2021, ENGG1003 uses Python only**
  - . . . yet some students will use MATLAB &/or C in later courses

- Thursday week 11: overview of MATLAB

- today's lecture: overview of C

What is C?

- "C is a general-purpose, procedural computer programming language supporting structured programming, lexical variable scope, and recursion, with a static type system. By design, C provides constructs that map efficiently to typical machine instructions. It has found lasting use in applications previously coded in assembly language. Such applications include operating systems and various application software for computer architectures that range from supercomputers to PLCs and embedded systems"

https://en.wikipedia.org/wiki/C_(programming_language)

Do we even need C?

- **C is not assessable in ENGG1003**

- BUT. . . C is currently used in some courses in some Engineering programs:
  - ▶ EE, Mecha, Aero, Medical (?)

- key courses which use C language:
  - ▶ ELEC2720, ELEC3730, AERO3600, MCHA3400, MCHA3500

2) C programming language

- C philosophy
- C development environment
- compiler
- assembly language
- executables
- embedded systems

Embedded systems and C

- xxx

C: key language details

- syntax
- data types
- arithmetic and relational operators
- flow control
- functions
- arrays

Hello world

- xxx

```c
#include <stdio.h>

int main()
{
    printf("Hello World");

    return 0;
}
```

3) Version control with Git

- principles—SRW
- live demo of practice—Brenton

Next steps

C is not assessable in ENGG1003

- getting started with C, if you need it *for later courses*

- Code::Blocks integrated development environment
  - ▶ https://www.codeblocks.org/downloads/binaries/
  - ▶ runs on platforms
    - Windows XP / Vista / 7 / 8.x / 10
    - Linux 32 and 64-bit
    - Mac OS X

- OnlineGDB