Henry Routson

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**Experience**

Leetcode programming

113 practice programming problems solved in numerous languages including
Python, C and Rust.
Over 1.4 thousand solution views.
https://leetcode.com/HenryRoutson/

ARES Software developer on Flight simulations 2023 - Present
https://eng.unimelb.edu.au/ares


Collaborating with industry software developers
and Masters Computing students
in Typescript and React 3JS Fibre.
So far I've implemented fins with a dynamic count into a 3JS render

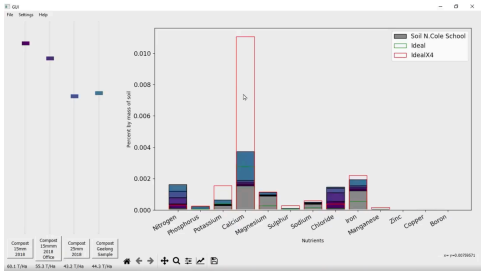
**Education**

Ballarat Grammar - Academic scholarship

The University of Melbourne - Major in Computing and Software Systems *2021 - Present*

| | |
|---|---|
| Foundations of Computing | 98% |
| Linear Algebra | 81% |
| Algorithms and Data Structures | 76% |
| - implemented a QuadTree, Dijkstra and A* | (92% project average) |
| Foundations of Algorithms | 75% |
| - implemented DNA processing, matrix operations | (91% project average, 100% MST) |
| Object Oriented Software Development | 76% |
| Engineering Modelling And Design | 77% |

**Projects**




*Soil Nutrient calculator* - Python (VCE Software development)
https://github.com/HenryRoutson/Soil-value-calculator

Architected GUI Software for a multi million dollar business
after 5 months of learning programming.
Performs Vector calculus to find the ideal compost
for a particular soil and crop combination.

*AutoHeader* - Rust programming (Extracurricular)
https://github.com/HenryRoutson/autoheader

```rust
fn setup(file_string: &str) {

    println!("\n\n\n\n Running  Setup \n  {} \n", file_string);

    if file_string.ends_with("-defs.h") { println!("-defs file already exists"); return; }

    // check if c or h file
    let ext = &file_string[file_string.len()-2..file_string.len()]; // extension
    if ext != ".c" && ext != ".h" { println!("file didn't contain a c or h extension"); return; }

    // check if defs file alreadys exists and setup is already done
    let file_string_no_ext = &file_string[0..file_string.len()-2];
    let defs_path = file_string_no_ext.to_string().add("-defs.h"); // remove extension and add
    let defs_path = Path::new(&defs_path);
    if defs_path.exists() {  println!("-defs file already exists"); return; }
```

Implemented the "Public" keyword to c programming language
to automate the creation of header files.
Uses automated testing and Regular Expressions.

*CHelp* - C (Extracurricular)
https://github.com/HenryRoutson/CHelp

Utilised C meta-programming to make dynamic memory in C easier.
Program displays data and location of un-freed mallocs.
From the README…

```
./tests/9_main


ERROR: wrong number of unfreed mallocs
        expected : 0
        found    : 1


        mallocs are listed below,
        in reverse allocation order
UNFREED       ---
file_name   : tests/9_main.c
line_number : 34
print_func  :
1 s2 3.000000
              ---
  FREED
```

+ Auto assert malloc and check if the size is negative or zero
+ Auto null after free
+ Assert all memory is freed at the end of a program running
+ Store messages for individual mallocs
+ Store print functions for each malloc, allowing generic debugging print functions
+ Runs in O(1) overhead
+ Uses Automated testing

**Skills**

Git SQL / Databases Data Structures and Algorithms Optimisation