Give Rust a Chance

I’m Slater

- I invest in tools for data teams at Bain Capital Ventures.
- I started thinking about Rust through our investment in Polars.

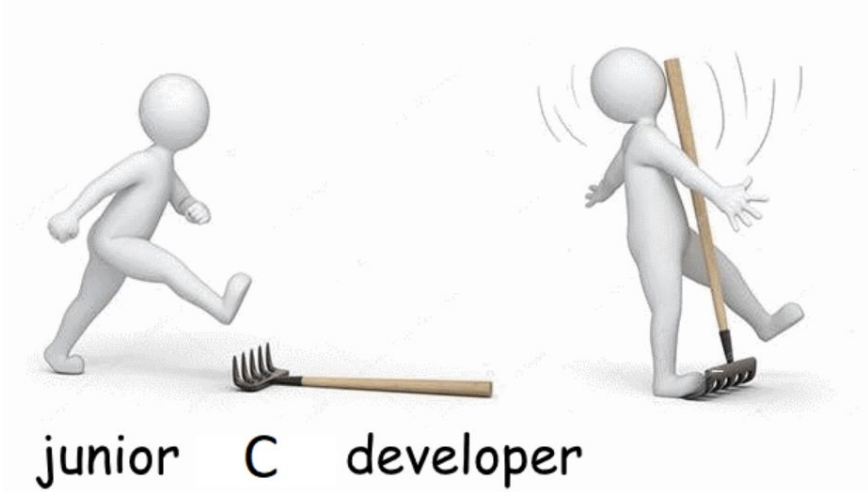
The Problem

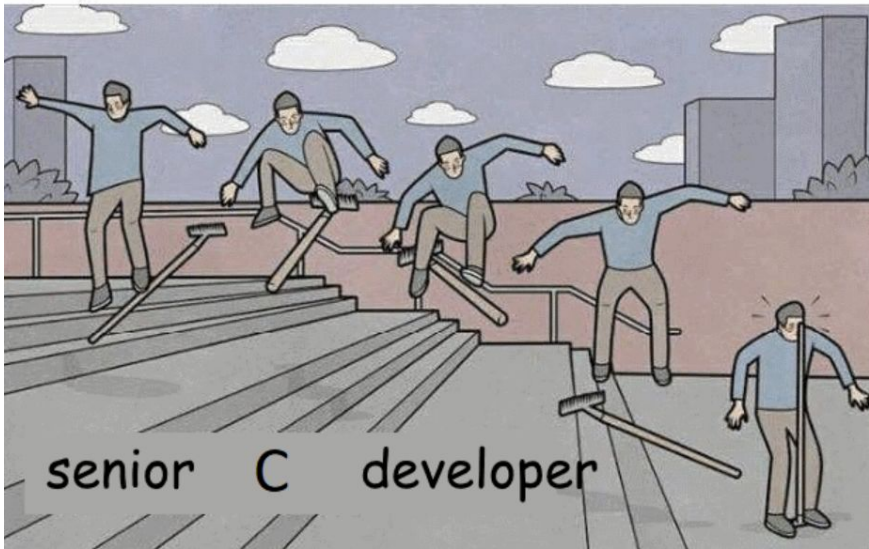
- Python is the most popular language for data science.
- Python is slow.

- Therefore: If you’re writing a high-performance library for data teams, you need the “frontend” to be in Python and the “backend” to be in some other language.

The Historical Solutions:

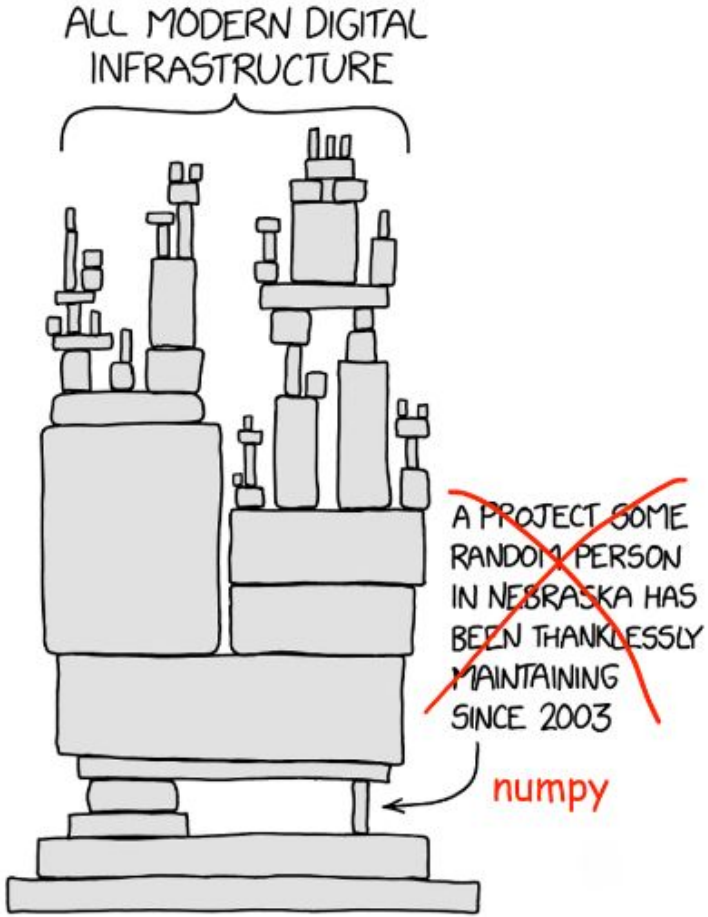
- “Just learn C”
- Yes, but:
  - Writing C is hard, and it’s easy to make subtle mistakes.
  - It’s not a fun language to dabble in part-time.





The Historical Solutions:

- Hope that somebody else learned C.
- Yes, but:
  - I like to write for loops. Vectorizing everything is a pain.
  - It's limiting to never be able to touch the internals.



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Because you can write bad Rust.
And it’s fine.

Matrix Multiplication

Subtly wrong C

```c
int **multiplyMatrices(int mat1[][2], int mat2[][2], int row1, int col1, int col2) {
  int **result = (int **)malloc(row1 * sizeof(int *));

  for (int i = 0; i < row1; i++) {
    result[i] = (int *)malloc(col2 * sizeof(int));
  }

  for (int i = 0; i < row1; i++) {
    for (int j = 0; j < col2; j++) {
      for (int k = 0; k < col1; k++) {
        result[i][j] += mat1[i][k] * mat2[k][j];
      }
    }
  }

  return result;
}
```

Probably correct Rust

```rust
fn multiply_matrices(
  mat1: &[[i32; 2]],
  mat2: &[[i32; 2]],
  row1: usize,
  col1: usize,
  col2: usize) -> Vec<Vec<i32>> {
    let mut result = vec![vec![0; col2]; row1];

    for i in 0..row1 {
        for j in 0..col2 {
            for k in 0..col1 {
                result[i][j] += mat1[i][k] * mat2[k][j];
            }
        }
    }

    result
}
```

Rust Stops You from Doing Bad Things

- Rust is memory safe.
- Rust has a strict compiler.
- Rust has nice concurrency primitives.
- Etc., etc.

This is Freeing

- It’s harder to make mistakes.
- It’s easier to find the mistakes you do make.
- And those mistakes are less costly.

- You should try it.

Thank You