

# How to Write an AI (in under 500 lines)

**Tim Menzies**

`mailto:youremail@example.com``timm@ieee.org`  
`http://yourhomepage.com``http://timm.fyi`

January 5, 2024



# Chapter 1

## 1

Too many choices, not enough time to look at them all.

- e.g. Hundreds of cars in a car yard, you try three, then buy one;
- e.g. You can't test everything – so you just test a few;
- e.g. Software has  $10^9$  of options – but you have time to try a few.

So lets apply *sequential model optimization*:

- $?, ?, ?, ?, ?$
- e.g. Hundreds of cars in a car yard, you try three, then buy one; Some terminology

$$\underbrace{y_1, y_2, \dots}_{\text{dependent variables, goals}} = f(\underbrace{x_1, x_2, x_3, x_4, x_5, x_6, \dots}_{\text{independent variables}})$$

- 
- But dependent variables are more expensive to collect
- e.g. A supermarket has 100 apples. Which ones are tasty? So lets walk data incrementally:

### 1.1 Problem

Too many choices, not enough time to look at them all. line 1.

- adas

---

```

1  function NUM.new(i,at,txt) -- --> NUM; constructor;
2  i.at, i.txt = at or 0, txt or "" -- column position
3  i.n, i.mu, i.m2 = 0, 0, 0
4  i.lo, i.hi = math.huge, -math.huge
5  i.w = i.txt:find"$" and -1 or 1 end
6
7  function NUM.new(i,at,txt) --> NUM; constructor;
8  i.at, i.txt = at or 0, txt or "" -- column position
9  i.n, i.mu, i.m2 = 0, 0, 0
10 i.lo, i.hi = math.huge, -math.huge
11 i.w = i.txt:find"$" and -1 or 1 end
12
13
14
15 function NUM.new(i,at,txt) --> NUM; constructor;
16 i.at, i.txt = at or 0, txt or "" -- column position
17 i.n, i.mu, i.m2 = 0, 0, 0
18 i.lo, i.hi = math.huge, -math.huge
19 i.w = i.txt:find"$" and -1 or 1 end
20
21
22 function NUM.new(i,at,txt) --> NUM; constructor;
23 i.at, i.txt = at or 0, txt or "" -- column position
24 i.n, i.mu, i.m2 = 0, 0, 0
25 i.lo, i.hi = math.huge, -math.huge
26 i.w = i.txt:find"$" and -1 or 1 end
27
28
29 function NUM.new(i,at,txt) --> NUM; constructor;
30 i.at, i.txt = at or 0, txt or "" -- column position
31 i.n, i.mu, i.m2 = 0, 0, 0
32 i.lo, i.hi = math.huge, -math.huge
33 i.w = i.txt:find"$" and -1 or 1 end
34
35
36 function NUM.new(i,at,txt) --> NUM; constructor;
37 i.at, i.txt = at or 0, txt or "" -- column position
38 i.n, i.mu, i.m2 = 0, 0, 0
39 i.lo, i.hi = math.huge, -math.huge
40 i.w = i.txt:find"$" and -1 or 1 end
41
42
43 function NUM.new(i,at,txt) --> NUM; constructor;
44 i.at, i.txt = at or 0, txt or "" -- column position
45 i.n, i.mu, i.m2 = 0, 0, 0
46 i.lo, i.hi = math.huge, -math.huge
47 i.w = i.txt:find"$" and -1 or 1 end
48
49
50 function NUM.new(i,at,txt) --> NUM; constructor;
51 i.at, i.txt = at or 0, txt or "" -- column position
52 i.n, i.mu, i.m2 = 0, 0, 0
53 i.lo, i.hi = math.huge, -math.huge
54 i.w = i.txt:find"$" and -1 or 1 end
55
56
57 function NUM.new(i,at,txt) --> NUM; constructor;
58 i.at, i.txt = at or 0, txt or "" -- column position
59 i.n, i.mu, i.m2 = 0, 0, 0
60 i.lo, i.hi = math.huge, -math.huge
61 i.w = i.txt:find"$" and -1 or 1 end

```

---

## 1.2 Test section one

## 1.3 What is Prolog?

- A programming language associated with artificial intelligence and computational linguistics.
- Based on formal logic.
- Declarative: Describe the problem, not how to solve it.
- Known for its ability to handle symbolic reasoning and knowledge representation.

some text here some text here some text here some text here some text here

asdsa

## 1.4 References

# Bibliography