

The Importance of Shepherding

Understanding Your Project in the Wild

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Who Am I? Still figuring that out!

Amos King

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Debugging

- Venturing into the unknown
- It takes time and money
- Built-in Tools

30-50%

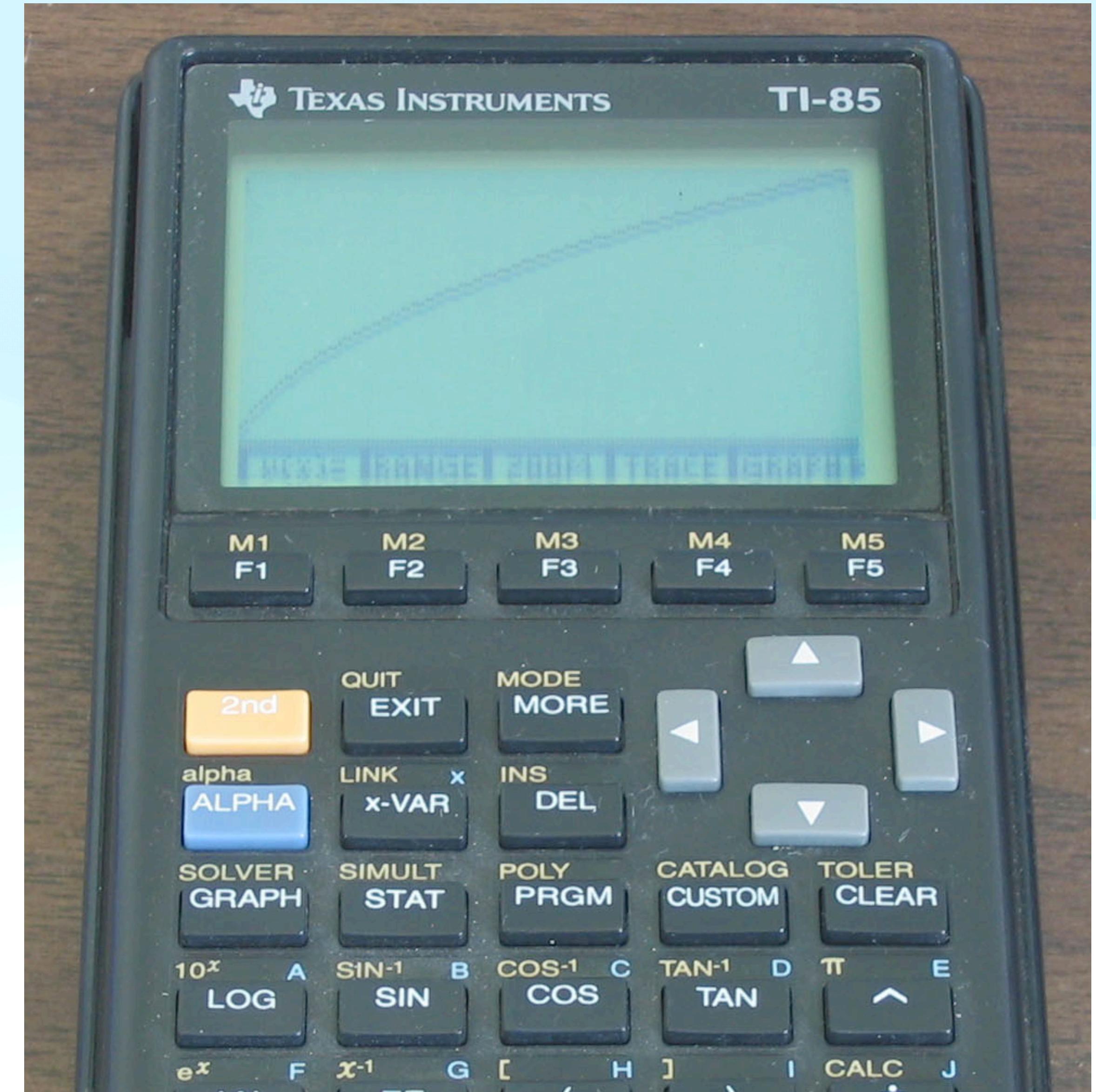
Time Spent Debugging

50-75%

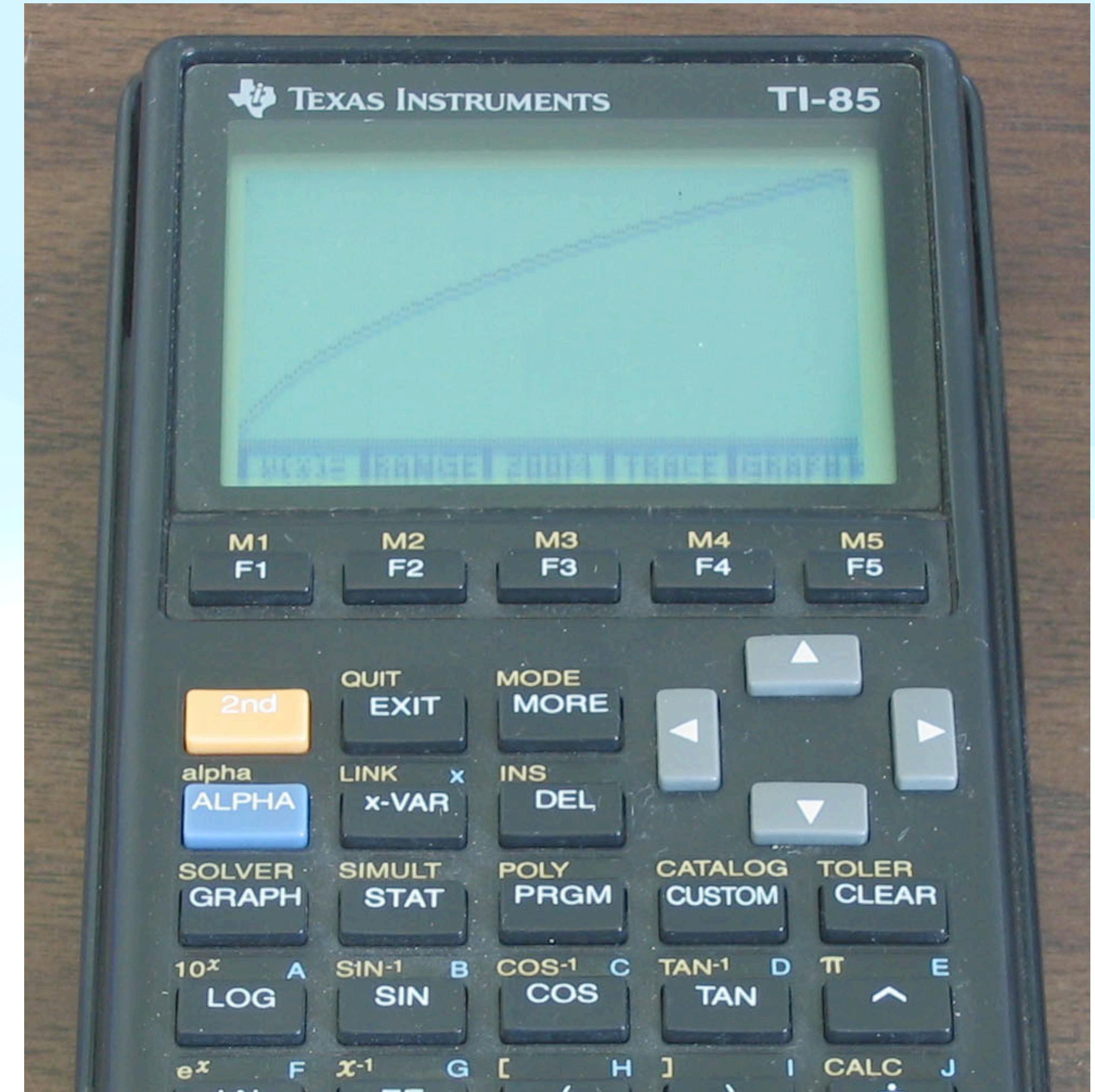
\$\$ Total Budget Spent on Debugging



Do you remember this?



If you do,
congratulations
you are old.



Game Status

Speed: 0

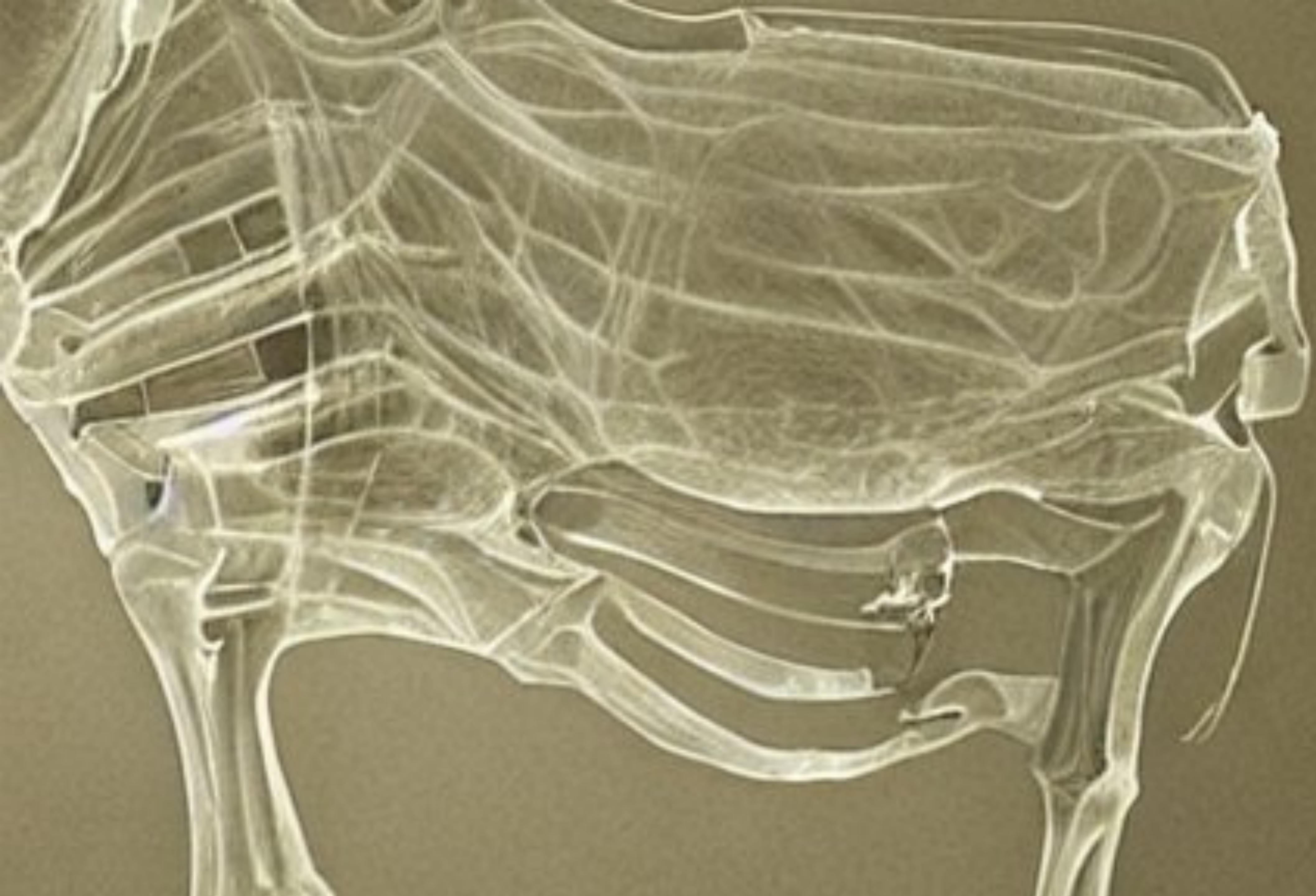
Score: 36

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Demo The Product



Built-in Tools

- IO.inspect/3
- Kernel.debug/2
- IEx.pry/0
- IEx Helpers - h, t, exports, b

:recon_trace

Production Safe Debugging

https://hexdocs.pm/recon/recon_trace.html



ReconTrace

Calls/3

```
:recon_trace.calls(tspec, max, options)
```

ReconTrace.tspec

{mod, fun, args}

```
@spec tspec :: {mod, f, args}
```

```
@spec mod :: :_ | module
```

```
@spec f :: :_ | atom
```

```
@spec args :: :_ | 0..255 | matchspec | shellfun
```



Demo

MatchSpec

```
shrink_matcher = [
  {
    {%{left: :"$1", min_width: :"$3", right: :"$2"}, :shrink},
    [ {":=<", {:-, :"$2", :"$1"}, :"$3"}],
    [:return_trace]
  }
]

:recon_trace.calls({TextRacer.Row, :update, shrink_matcher}, 10)
```

Ex2ms

Matchspecs are tough

```
import Ex2ms
shrink_matcher =
fun do
  { %{left: l, right: r, min_width: m}, :shrink }
  when r - l ≤ m →
    { :return_trace }
end
```

Options

```
[  
  pid: :all | :existing | :new | pid_term,  
  args: :arity | :args,  
  scope: :global | :local  
  formatter: (term → iodata)  
]
```

Recon

Diagnose Problems on Production Nodes

- `:recon` - high-level functionality
- `:recon_alloc` - discover problems with Erlang memory allocators
- `:recon_lib` - digging in and getting fancy
- `:recon_map` - formatting maps for output by other recon modules
- `:recon_rec` - formatting records for output by other recon modules
- `:recon_trace` - production safe debugging

Resources

- ▶ Recon - <https://hexdocs.pm/recon/overview.html>
- ▶ ReconEx - https://hexdocs.pm/recon_ex/extra-api-reference.html
- ▶ The Debugging Mindset - Devon H. O'Dell - ACM Queue Jan-Feb 2017 <https://queue.acm.org/detail.cfm?id=3068754>
- ▶ Erlang In Anger - Fred Hebert - <https://www.erlang-in-anger.com/>
- ▶ Matchspec - https://www.erlang.org/doc/apps/erts/match_spec.html
- ▶ Ex2ms - <https://hexdocs.pm/ex2ms/readme.html>
- ▶ Erlang's remsh is dangerous - <https://broot.ca/erlang-remsh-is-dangerous.html>

