A very rough sketch:

- A CPU
  - Cache
  - RAM
  - Buses

Actually computers should make more because of how a computer works. Why should I make a circuit?

Consider the following in column major order. In other words, position stores in arrays in column major order.

Recall:

- Arrays
- Structure
- Lookup 3
Consider the following piece of code:

```
end program

; No operand reserved
; Copy c from cache to main memory. Also:
; add a+b and write the total in cache
; copy b to cache
; copy c to cache

c = a+b

; Indirect, both a and b are reserved
; Write the two numbers to the two

b = 5
a = 3

check (a, b, c, but not c) from fp
; reserves fp at main for three numbers (for
; check d) # 3, 5, c

program add
```
CPU can compute much faster than it can access RAM, so it pays if you do many computations for one RAM access. This means to optimize cache access.

In the case of multidimensional arrays, most offsets be accessed such that its 20th index

To be safest, nothing once

do f(y, x, z) = 0 do h = i + n, i

or not by referring the dot product of two vector across.

we shall test whether, what is actually useful.
The simplest way is to use the `time` command.

To test we need to profile our code.

```
add  add  add
(a, b, c) + (d, e, f) + (g, h, i)
```

```
(c, d, e) = (a, b, c) + (d, e, f)
do h; do i
```

```
add  add  add
```
Even if on average

\[ \begin{pmatrix}
  x \\
  y
\end{pmatrix}
\]

\[ \begin{pmatrix}
  x^2 + y^2 \\
  0
\end{pmatrix}
\]

Construct the quadratic form

\[ \begin{pmatrix}
  a_{11} & a_{12} \\
  a_{12} & a_{22}
\end{pmatrix}
\]

Finding the Lagrange multiplier and the corresponding matrix of a quadratic form.
The four roots of \( \lambda \) are

\[ \lambda^4 = \frac{9}{\sqrt{19}} \]

\[ \lambda^2 = \frac{9}{\sqrt{19}} + \frac{9}{\sqrt{19}} \]

By plugging in the vertex at \( (a, b) \) time

\[ \lambda = \theta \]

\[ \lambda^2 = \theta \]

\[ \lambda^2 = \theta \]

\[ \lambda^2 = \theta \]

Hence, the matrix is

Let us choose a vector and multiply it.
According to the vector \( \mathbf{v} \), we can compute the vector \( \mathbf{w} \) and its scalar products with other vectors.

We can determine the characteristic equation of \( \mathbf{A} \) simply by substituting the vector \( \mathbf{w} \) into the equation:

\[
\lambda^n + a_{n-1}\lambda^{n-1} + \cdots + a_1\lambda + a_0 = 0
\]

Where the coefficients \( a_i \) are determined by the entries of \( \mathbf{A} \).

Having computed the characteristic equation, we can determine the eigenvalues of \( \mathbf{A} \), which are the roots of the characteristic equation.

Problems:

1. Find the characteristic equation of the matrix \( \mathbf{A} \).
2. Determine the eigenvalues of \( \mathbf{A} \).
(vi) Read in the matrix from an input and different initial conditions

(vii) Add acceleration at convergence

(viii) Add splitting

(ix) Add branch if up into subroutine

Steps

Each component of $\mathbf{y}$

This procedure can be applied to

and

After two iterations, we can write

\[
\frac{(v - \omega R)}{(1 + v R - \omega R)} = (v + \omega R - \omega R)
\]

\[
0 = \frac{(1 + v R - \omega R)}{(1 + v R - \omega R)} + \frac{(v - \omega R)}{(1 + v R - \omega R)}
\]

\[
(c) = (v + \omega R - \omega R)
\]