CS 103000
Prof. Madeline Blount

Week 4:
LOOPS (part 1) + RANDOMNESS

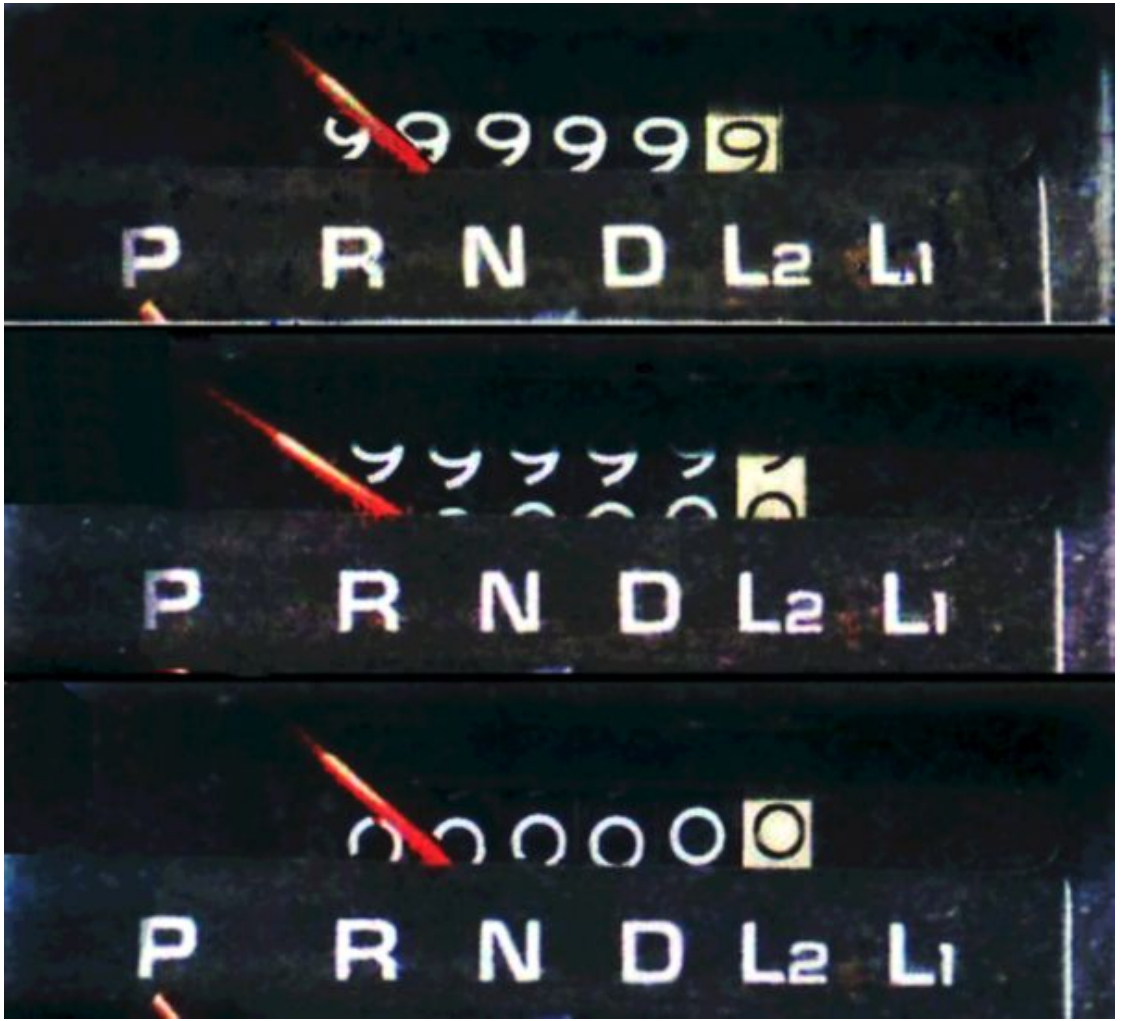
Attendance:
https://cs103-proton.glitch.me/

Dall-E 2: cats learning C++ in the forest on '90's technology

1708965155 … 1708965156 … 1708965156 …

Data Type	Memory Size
bool	1 byte
char	1 byte
int	4 bytes
float	4 bytes
double	8 bytes
std::string	24 bytes

INTEGER OVERFLOW



Binary : 01111111 11111111 11111111 11110000

Decimal : 2147483632

Date : 2038-01-19 03:13:52 (UTC)

Date : 2038-01-19 03:13:52 (UTC)

😱 INTEGER OVERFLOW: weirdness, limitations

🖥️ we don't have infinite memory!

int = 32 bits (4 bytes)

00000000000000000000000000000000

11111111111111111111111111111111

4,294,967,295

+/- 2,147,483,647

INTEGER OVERFLOW

RUNNING OUT OF TIME!

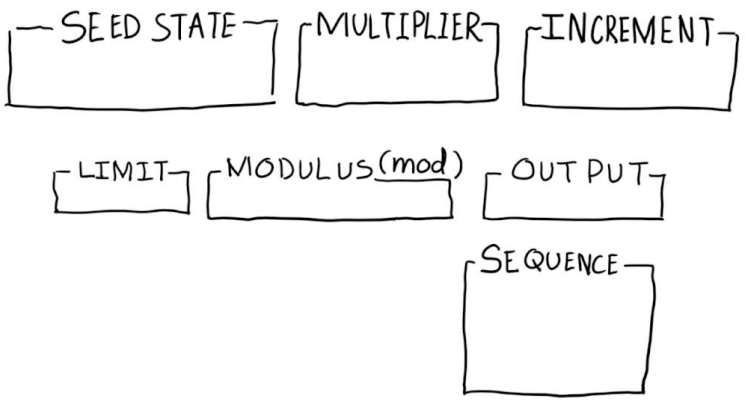
Jan. 19th, 2038

32-bit integer seconds ++ after Jan. 1, 1970 (UNIX TIME)

https://www.youtube.com/shorts/gzf8hS69KAs

Pseudorandom! a **simulation,** random enough

- `rand()` = Linear Congruential Generator (LCG)
- `x = ((a * x) + c) % m`
- Next number based on the previous (**state**)



- x = ((a * x) + c) % m
- if: a (multiplier) = 3
- if: c (incrementor) = 4
- if: m (modulo %) = 15
- if: x0 = 1
- Write out the first 6 numbers of this sequence.

PROJECT EULER

https://projecteuler.net/

800+ problems …

Project Euler.net

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Multiples of 3 or 5

Problem 1

If we list all the natural numbers below 10 that are multiples of 3 or 5, we get 3, 5, 6 and 9. The sum of these multiples is 23.

Find the sum of all the multiples of 3 or 5 below 1000.

Problem 1: answer 233168