W3 - U1
W4 - U5
W5 - U3
U6 - UX
W7 - UX ← start papers
2/28

2/28 — Nintendo games (W3)
2/28 — Harder Mario (W2)
3/7 — Portal (U5)
3/7 — Sliding Block (U4)

Make a formal assignment
- Presentation - length/style
- Discussion
- Question
  - future work
  - extensions

Make-a-game assignment

Puzzle games for groups

Summary → CGT

- Normal play games
  - Impartial games
    - Nimbers
    - MEX Principle — any pos. is equiv. to a nimber.

  - Partizan games
    - Dyadic positions / numbers.
    - + R player advantage
    - − L player advantage
    - O type P. 2nd player advantage
    - $0, \pm \frac{1}{2^k}$, or sum of them $\pm n$
    - Simplicity principle — some pos. in partizan games are equivalent to dyadic pos.
      For a $\gamma = \{\alpha_1, \dots \alpha_m \mid \beta_1, \dots, \beta_n\}$.
      - pos. is oldest number in $\left(\max_{1 \le i \le m} \alpha_i, \min_{1 \le i \le n} \beta_i\right)$
        based on birthdays

Sum games
$$* a + * b$$
$$= * (a \oplus b)$$

$$\cdot a + \cdot b = \cdot (a + b)$$

Domineering

$$\boxed{\blacksquare} = \left\{ \boxed{\blacksquare} \;\middle|\; \boxed{\;\;} \right\} = \left\{ \cdot 1 \;\middle|\; -1 \right\}$$

type N

Our line in the sand
- CG
- Normal play
- impartial or partizan
- No type N in partizan
- Not loopy (bounded)

} always play optimally

3-SAT
NP-complete