

Nerding out in Large Classes with Interactive Games

Slides + Links: <https://waf.cs.illinois.edu/slides/pbd21/>

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Introductions

No good party starts without introductions...



Introductions:

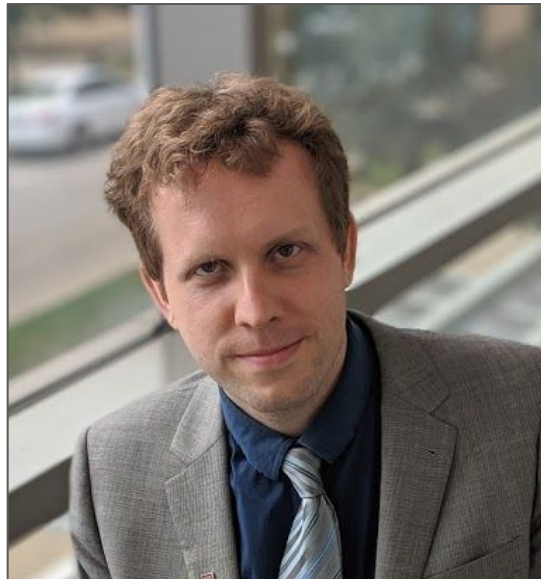


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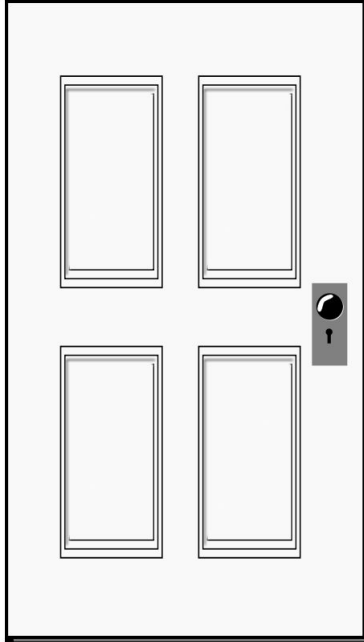
Grainger College of Engineering

@profwade

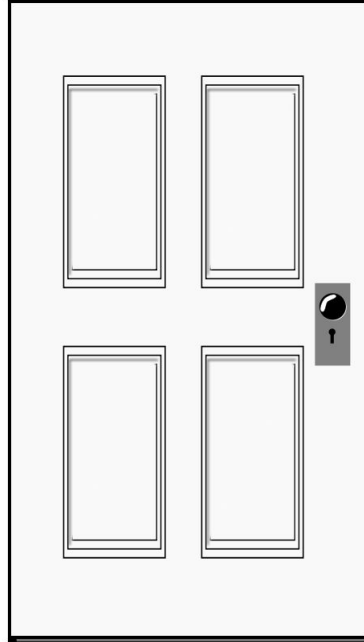
Monty Hall (Probability)

The background image is a photograph of the Alma Mater statue at the University of California, Berkeley. The statue is a large, classical-style figure of a woman in a long robe, standing on a pedestal. In the foreground, there is a crowd of people, mostly seen from the back or side, looking towards the statue. The entire image is covered with a semi-transparent red overlay. The text 'Monty Hall (Probability)' is written in a large, white, sans-serif font, centered over the image.

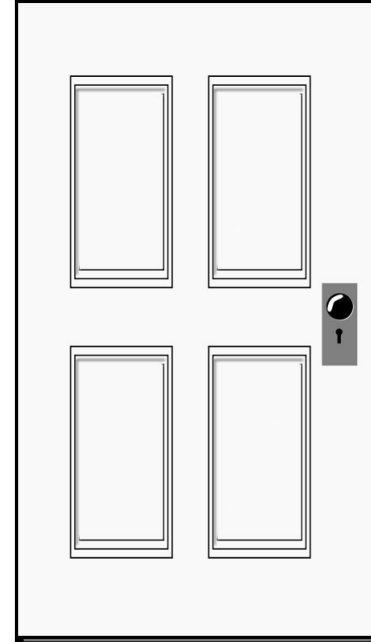
Door #1



Door #2



Door #3



<https://d7.cs.illinois.edu/projects/interactive-classroom/monty-hall-lets-make-a-deal/>



Lincoln Hall Theater
Oct. 8, 2021
Photo by Katy Miles



Lincoln Hall Theater
Oct. 8, 2021
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Keywords -- Pedagogy

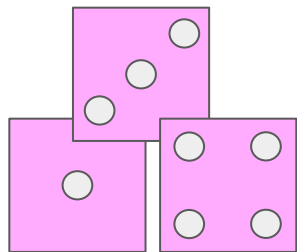
- *Realistic Math Education* - students see the connection between what they do in the classroom and the real world
- *Interactive Lecture Demonstrations* - students can actively participate and engage during a large lecture
- *Memorable Examples that Challenge Intuition* - students remember these examples because they go against their original intuition



Monty Hall (Reinforcement Learning)

Reinforcement Learning

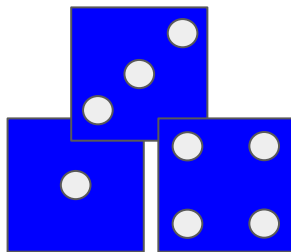
Action #1: You must pick a door.



Pink Dice



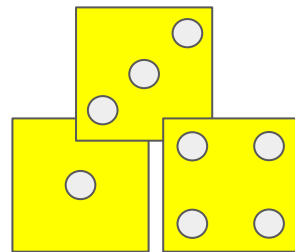
Choose Door #1



Blue Dice



Choose Door #2



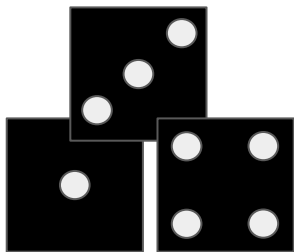
Yellow Dice



Choose Door #3

Reinforcement Learning

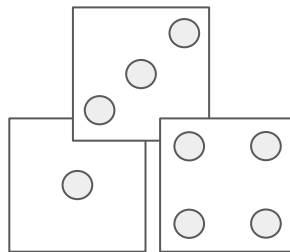
Action #2: You must pick if you want to change your door.



Black Dice



Change Door



White Dice



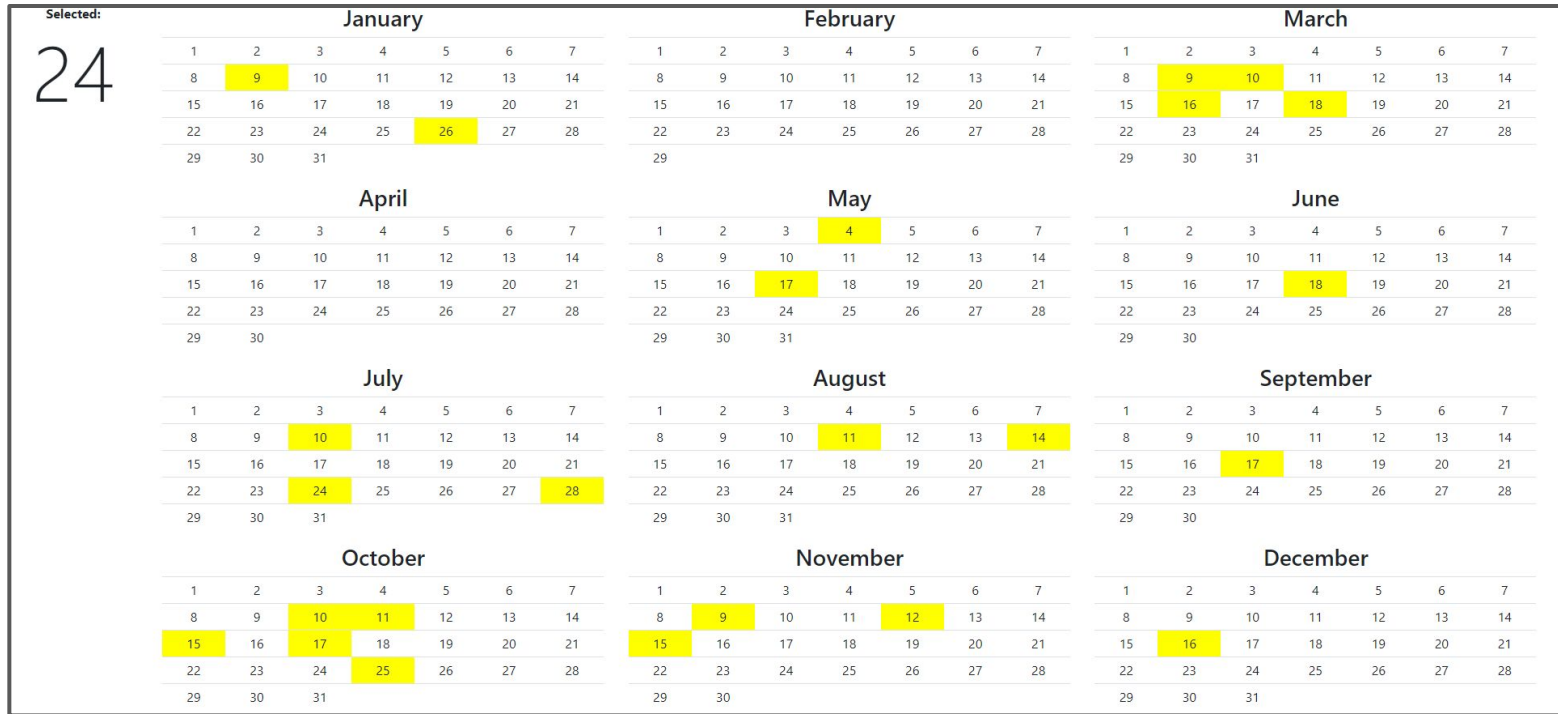
Keep Door

Reinforcement Learning

- When we win: (**positive reward**)
 - Add two dice of the winning choice!
- When we lose: (**negative reward**)
 - Remove the losing dice that was chosen.

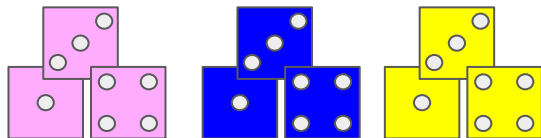
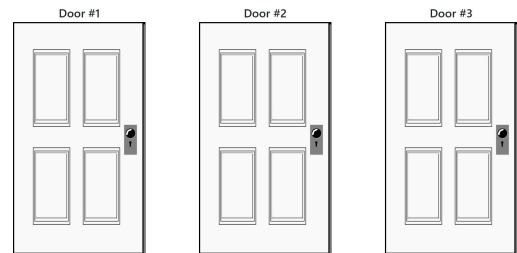
Birthday Problem (Combinatorics)

The background image is a photograph of a statue of Alma Mater, a personification of a university, standing on a pedestal. The statue is surrounded by a large crowd of people, mostly seen from the back, suggesting a public event or ceremony. The entire image is covered with a semi-transparent red filter, which makes the colors appear monochromatic and gives it a dramatic, academic feel.



<http://d7.cs.illinois.edu/projects/interactive-classroom/birthday-problem-calendar/>

Thank You!

A calendar for the year 2024 is displayed. The months are arranged in a grid. The number 24 is highlighted in the top left corner, indicating the current date. The calendar shows the days of the week and the dates for each month.

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