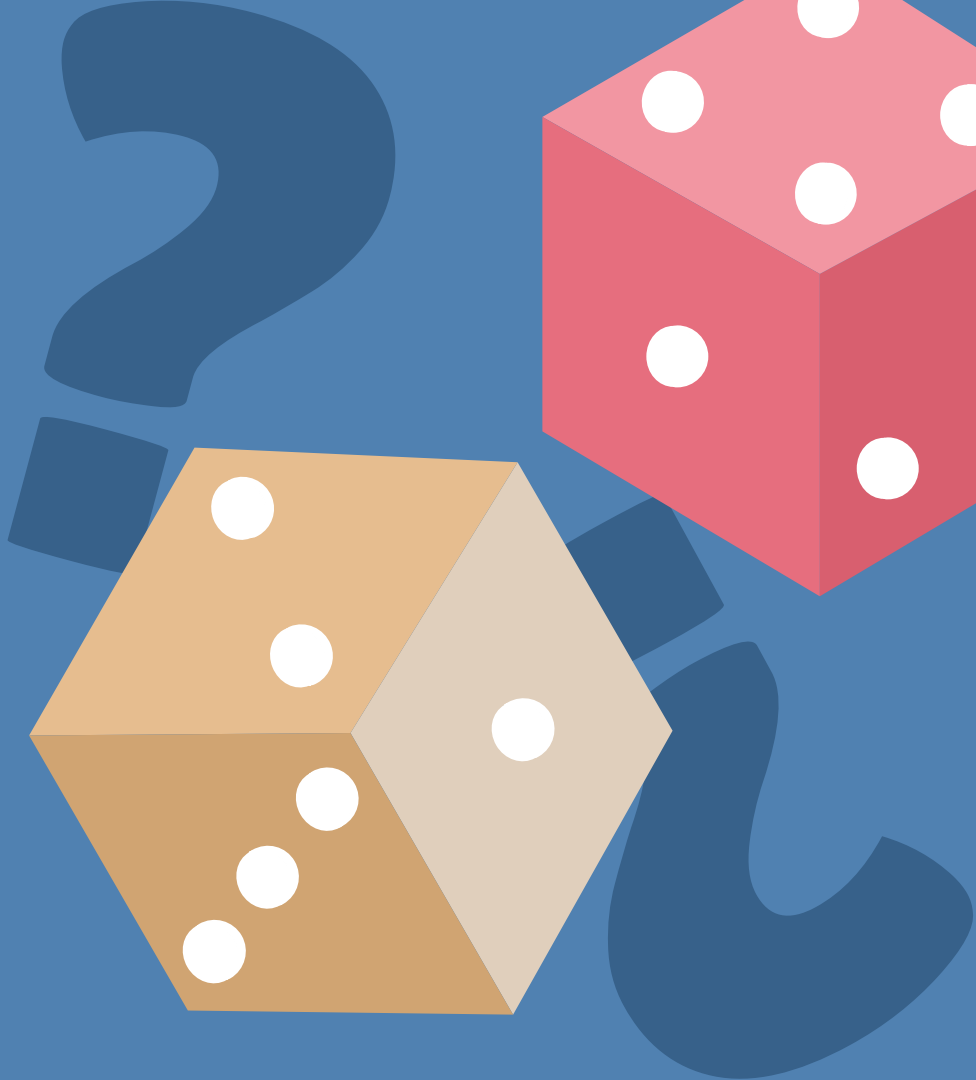
Section 1

CSE 312



-administrivia-

welcome!

Announcements & Reminders

- **Section Materials**
  - Handouts will be provided in at each section
  - Worksheets and sample solutions will be available on the course calendar later this evening

- **Office Hours**
  - Times posted on the calendar on the course website

- **HW1**
  - Due Wednesday 6/26 @ **11:59pm**

Homework

- **Submissions**
  - LaTeX (highly encouraged)
    - overleaf.com
    - template and LaTeX guide posted on course website!
  - Word Editor that supports mathematical equations
  - Handwritten neatly and scanned
- Homework will typically be due on **Wednesdays at 11:59pm** on Gradescope
- Each assignment can be submitted a **max of 48 hours** late
- You have **7 late days total** to use throughout the quarter
  - Anything beyond that will result in 10% deduction per day

-ice breaker-

welcome!

Your TAs :)

- [add info here, also add in office hours times]

Icebreaker :)

- Small groups of 4-6ish
- Please share with your group
  - Your name
  - Number of years in department/ at UW
  - What was something fun you did over Spring break?
  - What are you concerned about for 312 / what are you excited about?
- Then, we'll go around the room and share
  - your name
  - something you're excited about for the summer (or fun fact about you :))

-content review-

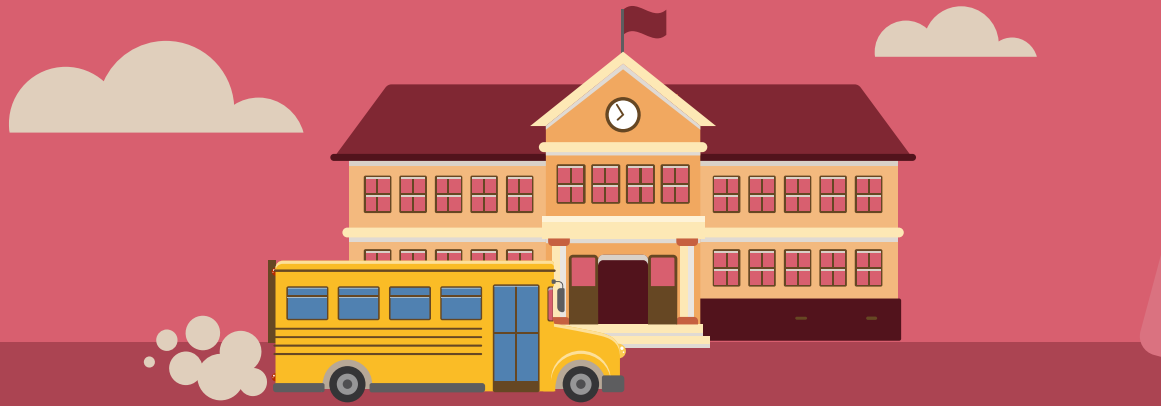
counting 😎

Any lingering questions from this last week?

Each week in section, we'll be reviewing the main concepts from this week and putting them into action by going through some practice problems together. But before we get into that review, we'll try to start off each section with some time for you to ask questions. Was anything particularly confusing this week? Is there anything we can clarify before we dive into the review? This is your chance to clear things up!

Counting

We've been talking about how to *count* the number of times different events could occur!



___ RULE _________

If we want to choose from *either* `n` options *or* `m` options, *with no overlap,* there are _____ options in total.

SUM RULE

If we want to choose from *either* `n` options *or* `m` options, *with no overlap,* there are `n+m` options in total.

useful when there are multiple non-overlapping possibilities

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_____ RULE_____

If we have a *sequential process* where there are `m1` choices in the first step, `m2` choices in the second step, and `m3` choices in the third step, there are _____ options in total.

SUM RULE ---------

If we want to choose from *either* `n` options *or* `m` options, *with no overlap*, there are `n+m` options in total.

useful when there are multiple non-overlapping possibilities

PRODUCT RULE -----

If we have a *sequential process* where there are `m1` choices in the first step, `m2` choices in the second step, and `m3` choices in the third step, there are `m1 * m2 * m3` options in total.

useful when there is a clear sequential process

Permutations

useful to count when order does matter

If you want to re**order** `k` **distinct** elements, there are `k!` ways - `k * (k-1) * ...`

If you want to choose a **sequence** of `k` elements from a set of `n` elements, there are `(n! /(n-k)!)` ways

Combinations

(binomial coefficient)

useful to count when order does <u>not</u> matter *(e.g., choosing a subset)*

If we want to choose a **set** of k elements from a group of n elements, there are $\binom{n}{k} = \frac{n!}{k!\,(n-k)!}$ options

you can also just write it as $\binom{n}{k}$

Complementary Counting

useful when it is easy to compute the size of the complement of the set we're interested in

If the **total number** of options we can choose from is n, but m of these options are **not desirable**, then n - m represents the number of desirable options.

LET'S GET TO SOME PROBLEMS :)