

myStudyPal

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Helping students work smarter, not harder by optimizing their performance on courses.

Meet Spencer

- He's currently taking 6 courses
- Halfway into the semester, he has submitted few Homeworks and written midterms for each course.
- Not all professors are giving him constructive feedback on his current performance in a timely manner.
- Between classwork, lab work, and his job, he is very busy and needs to know how to optimize his time.
- Does not know how he's currently performing all his courses.



What can Spencer do?

Within reach...but not ideal!

Calculate
Score
Individually



Might take a significant amount of time. Lots of equations and non-linearities.

E-mail
Professor

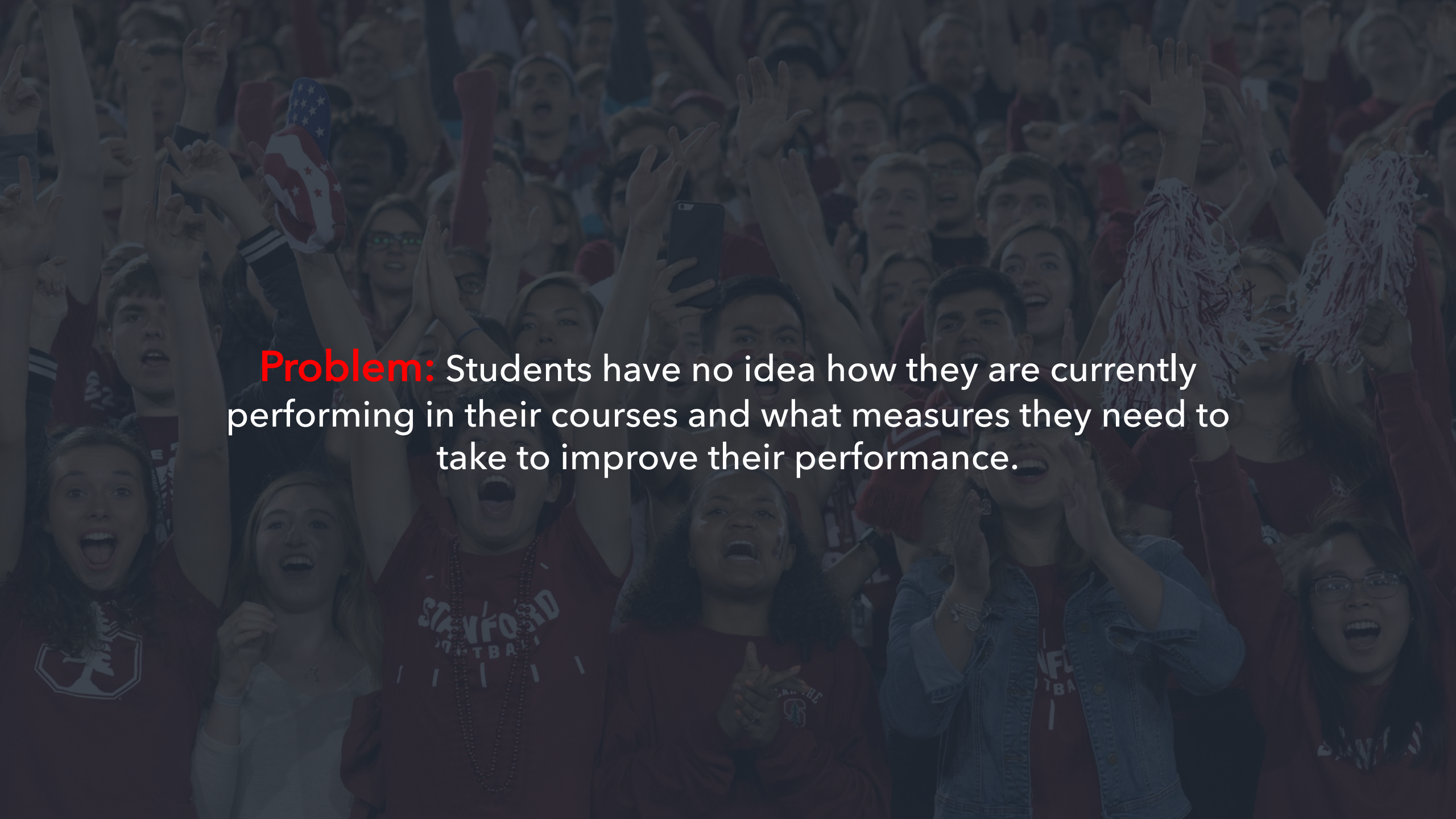


Professors might not be very responsive.. They don't know overall grade.

Just Study
More



There might be deadlines for other courses to keep. Cannot allocate all the time.

A large crowd of students, mostly young women, are shown from the chest up, cheering enthusiastically. Many have their hands raised in the air. Some are wearing red shirts, one with "STANFORD FOOTBALL" visible. One student is holding a smartphone up to take a photo. Another is holding a pom-pom. The background is a dense crowd of more students, all appearing to be part of the same event. The overall mood is one of excitement and celebration.

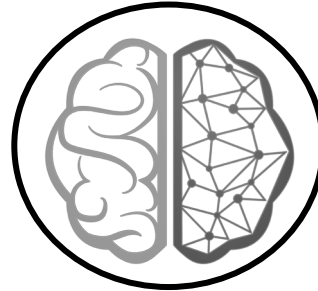
Problem: Students have no idea how they are currently performing in their courses and what measures they need to take to improve their performance.

What myStudyPal Provides

- 1 Assessment tracking
 - 2 Course Feedback
 - 3 Grade Optimization
-



Be able to track how you have been performing in assessments across all semesters. Graphs your improvements.



We look at all courses and factor in the non-linearities in the grades. Account for this and advise on which courses you need to concentrate on.



Uses a probabilistic machine learning algorithm to predict what you need in your future assignments to reach the next grade level.

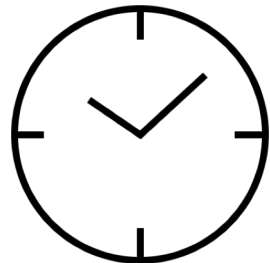
Value Proposition



Constant information on
performance throughout the
semester



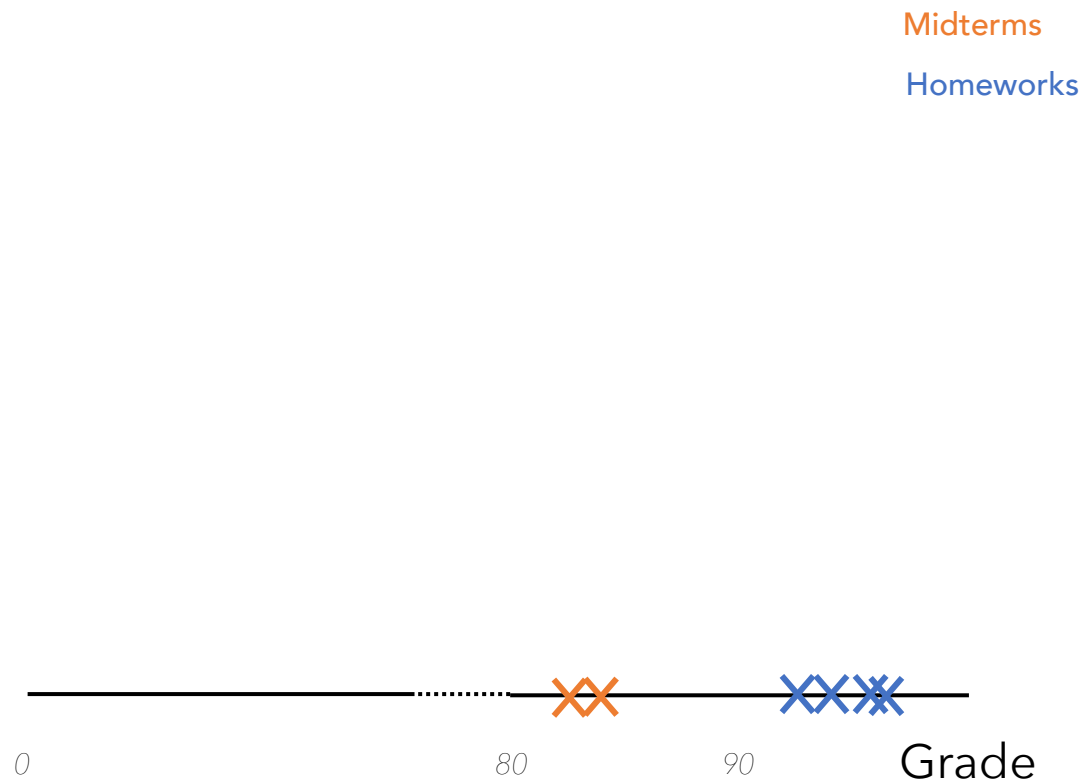
Less stress



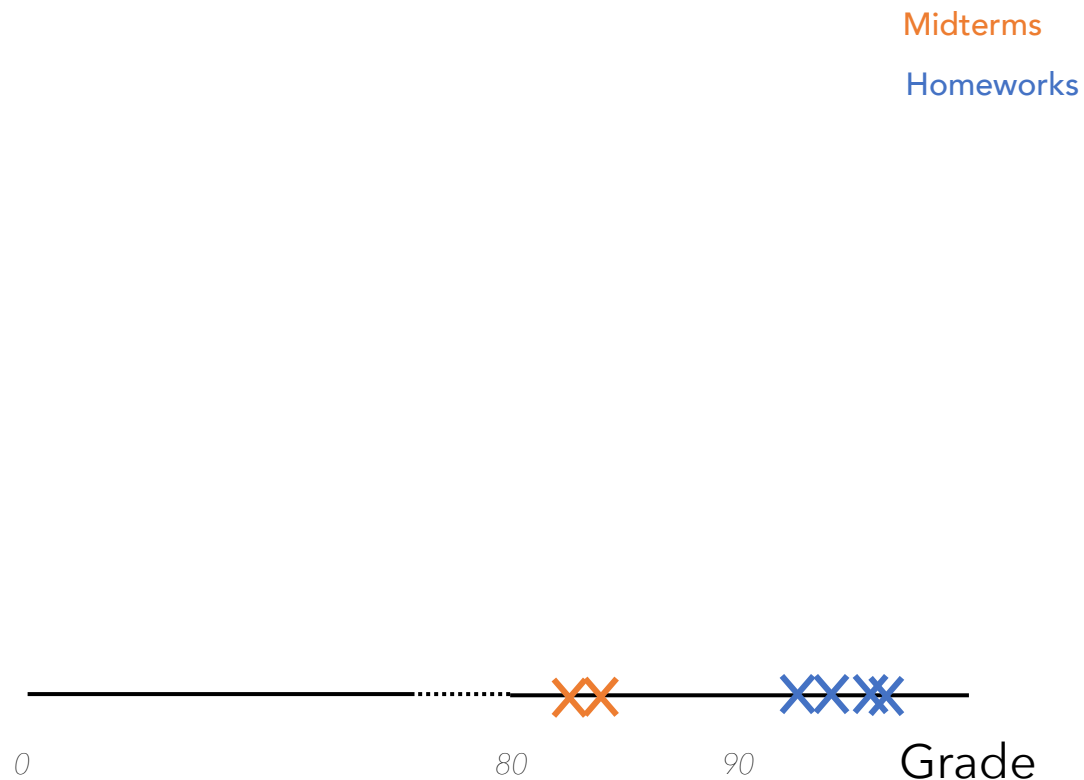
Time saved

How myStudyPal does it

Now let's assume that the student is **in the middle** of the semester and we have **some** data points



How myStudyPal does it



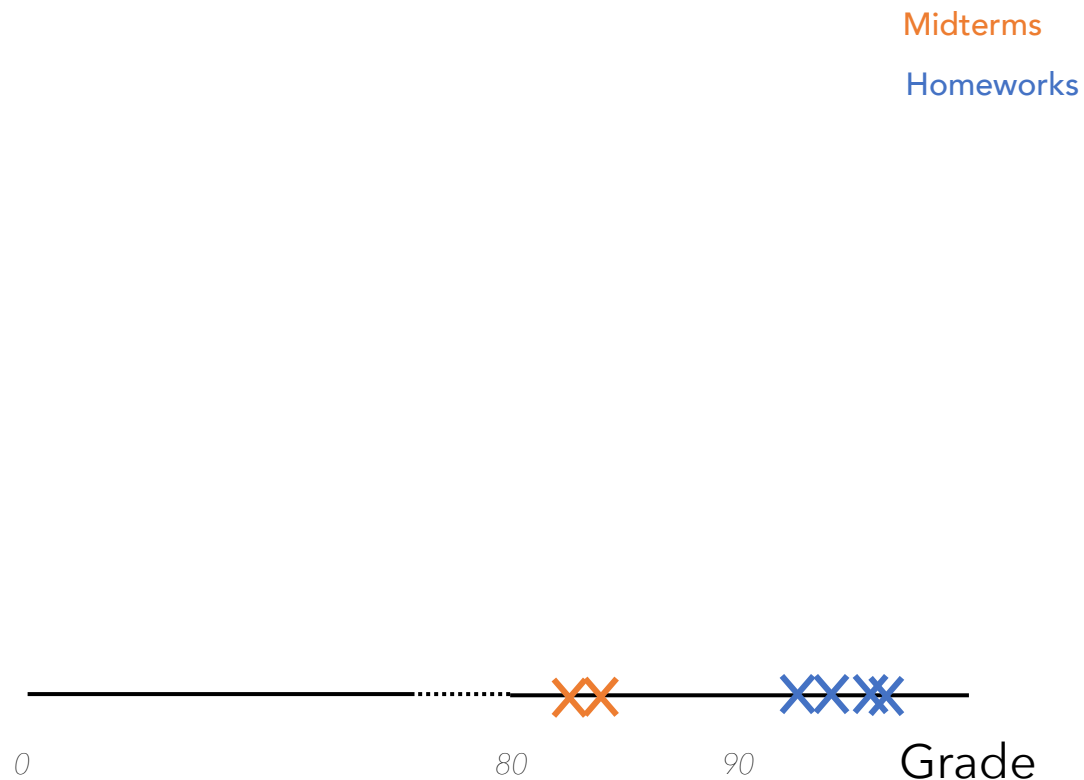
Now let's assume that the student is **in the middle** of the semester and we have **some** data points

We'll get the equation

$$aM + bH = c$$

Where c is the next grade level (e.g. 90 : A-)

How myStudyPal does it



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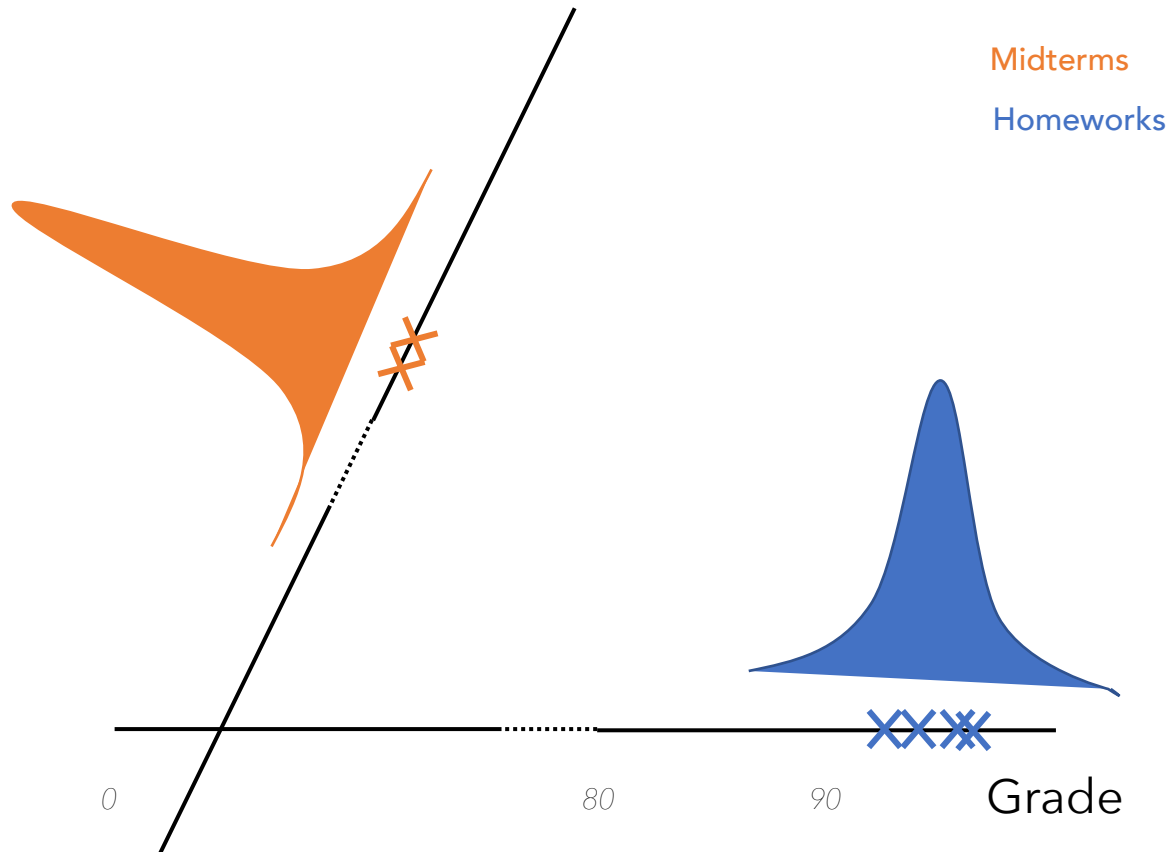
$$aM + bH = c$$

Where c is the next grade level (e.g. 90 : A-)

Since we have a linear equation, there can be an infinite set of solutions for M and H .

We need a cost function whose minimum is the optimal value.

How myStudyPal does it



INTUITION: We model the data points as a Beta Distribution where

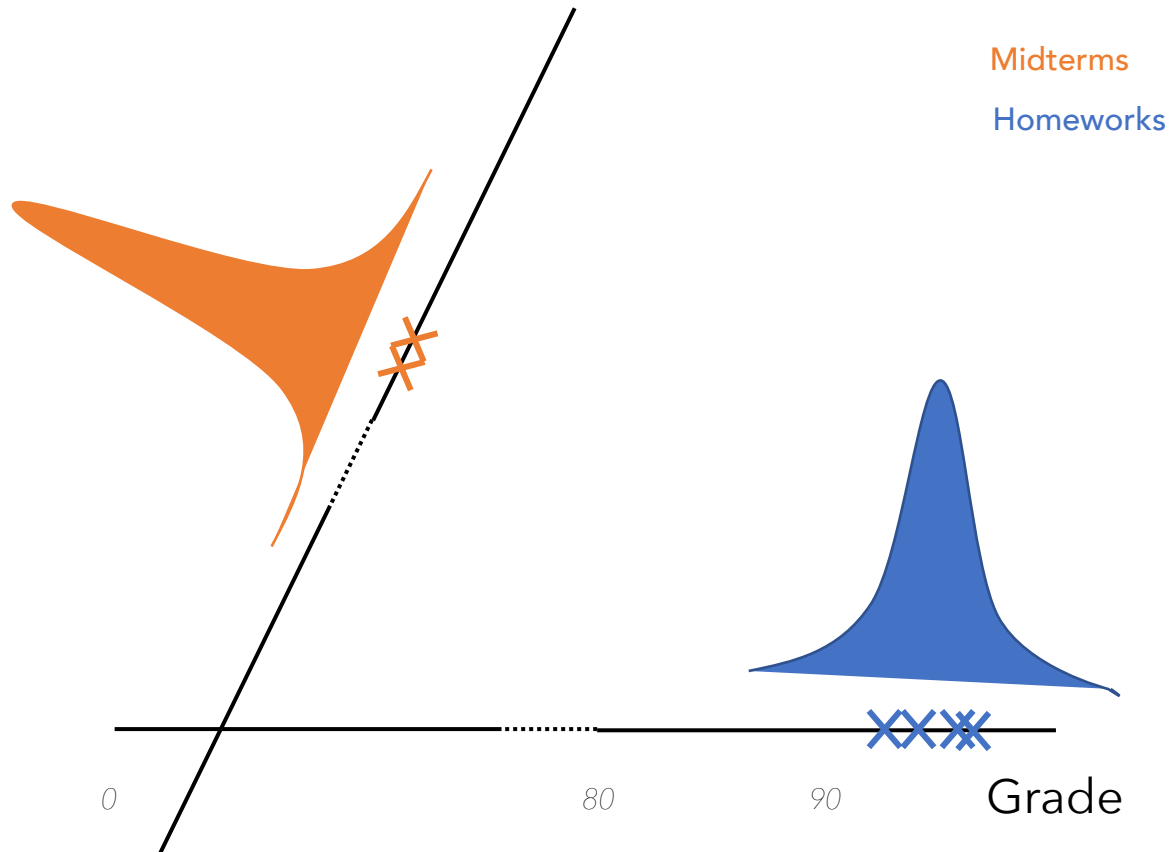
$$f(x; \alpha, \beta) = \frac{\Gamma(\alpha + \beta)}{\Gamma(\alpha)\Gamma(\beta)} \cdot x^{\alpha-1} \cdot (1 - x)^{\beta-1}$$

$$M \sim 100 \cdot \text{Beta}_1(\alpha_1, \beta_1)$$

$$H \sim 100 \cdot \text{Beta}_2(\alpha_2, \beta_2)$$

We use a cost function that models these two probability spaces into an \mathbb{R}^d vector.

How myStudyPal does it

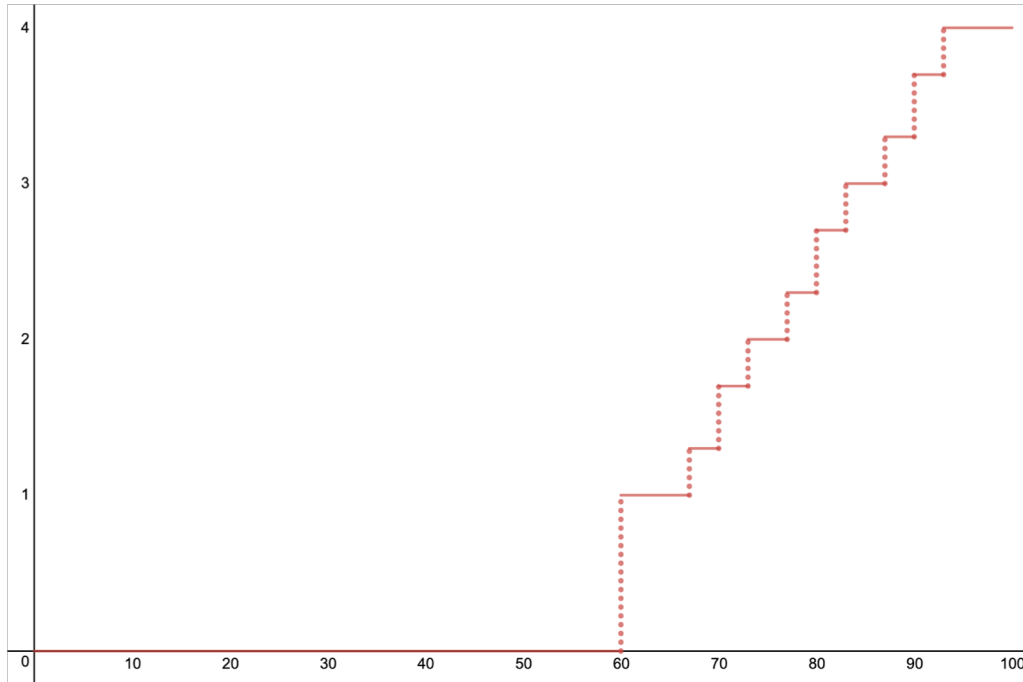


In our demo we used a Gaussian distribution to describe variance along each variable.

After lots of calculation and experimentation, we defined a scoring function that could suitably determine the "value" of a certain set of scores on future (untaken) assignments.

It does this by taking into account the likelihood of occurrence gotten from the probability distribution, the benefit gained from reaching the next grade line, and the number of credits for the course.

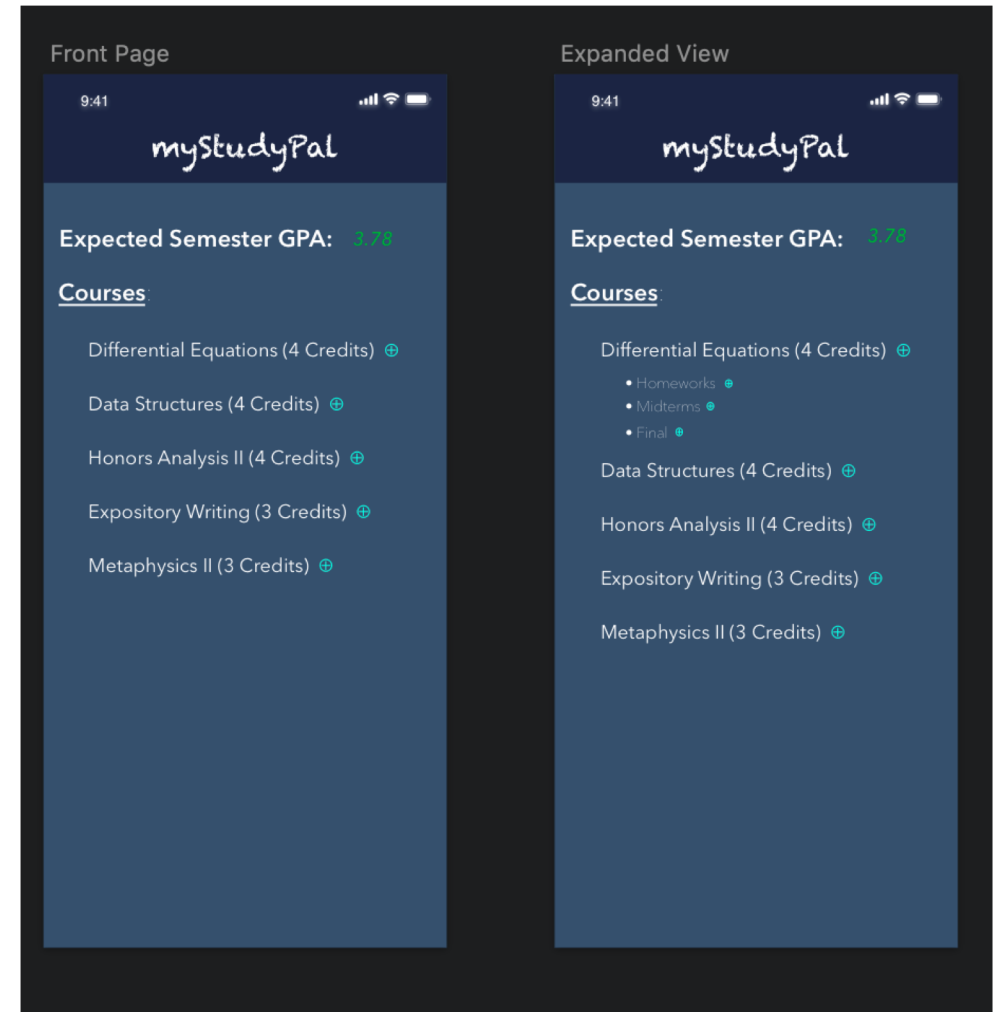
How myStudyPal does it



There also exists non-linearities in the GPA scale.
Our algorithm accounts for this to ensure that you concentrate on the right courses to do the best in class.

Moving Forward

- Add previous semester courses to better inform probability distributions
- Add in more sophisticated course curves
- Allow for degree and future course planning informed by our current algorithm
- Create a HTML / CSS and JS frontend, using our current Python backend.



Demo