myStudyPal

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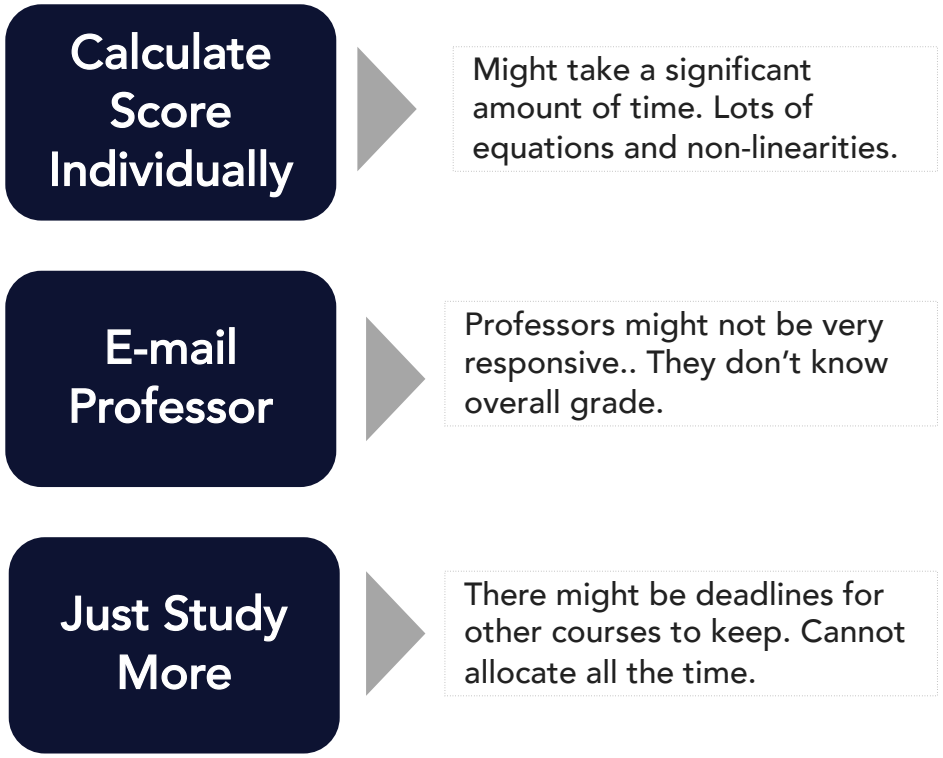
Helping students work smarter, not harder by optimizing their performance on courses.

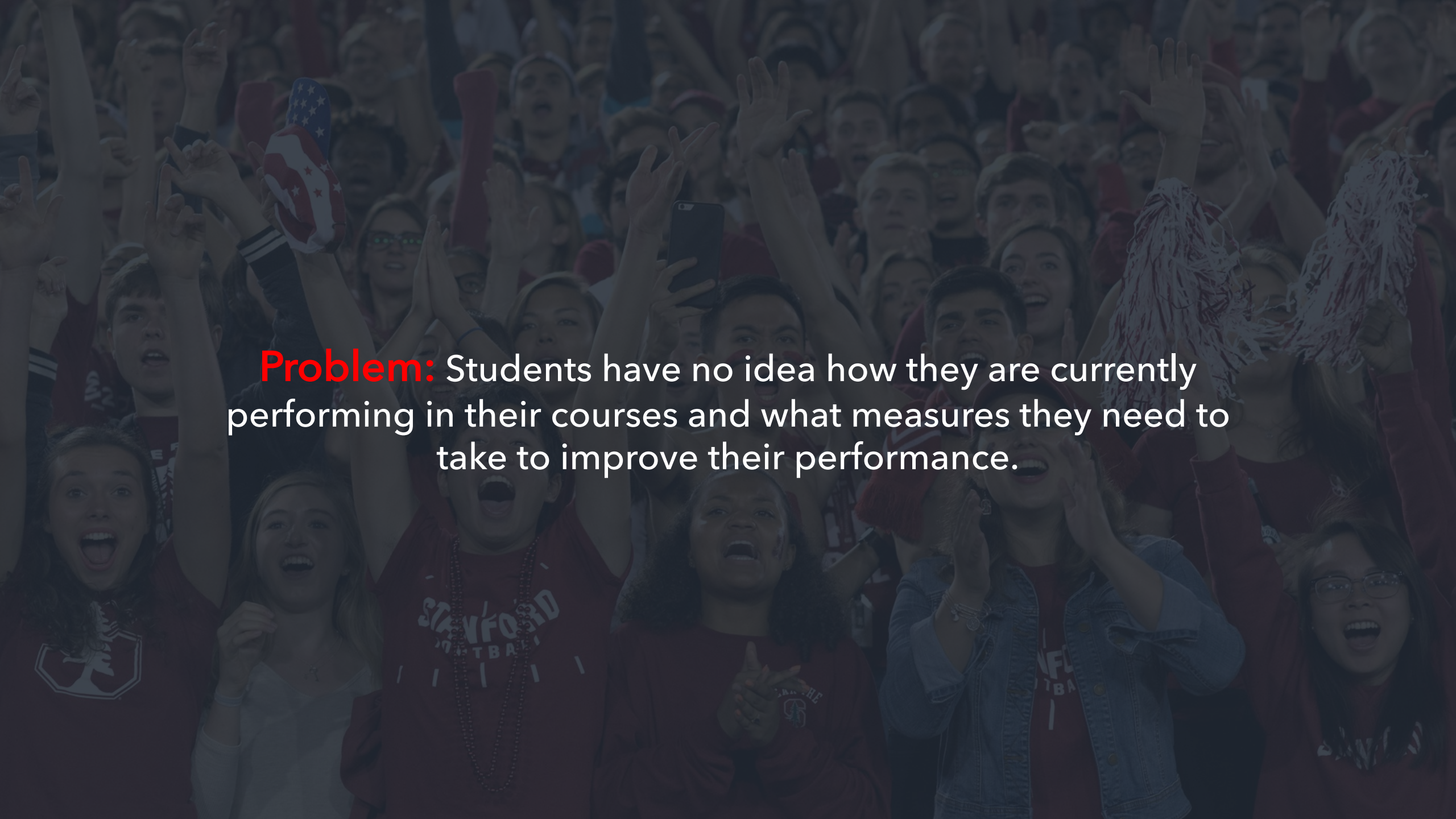
Meet Spencer

- 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!**





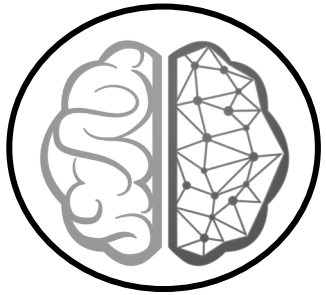
Problem: Students have no idea how they are currently performing in their courses and what measures they need to take to improve their performance.

What myStudyPal Provides

1 Assessment tracking

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

2 Course Feedback



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.

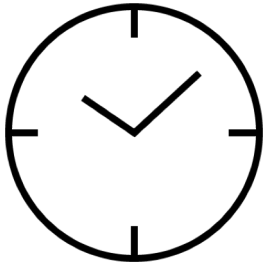
3 Grade Optimization

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

Value Proposition

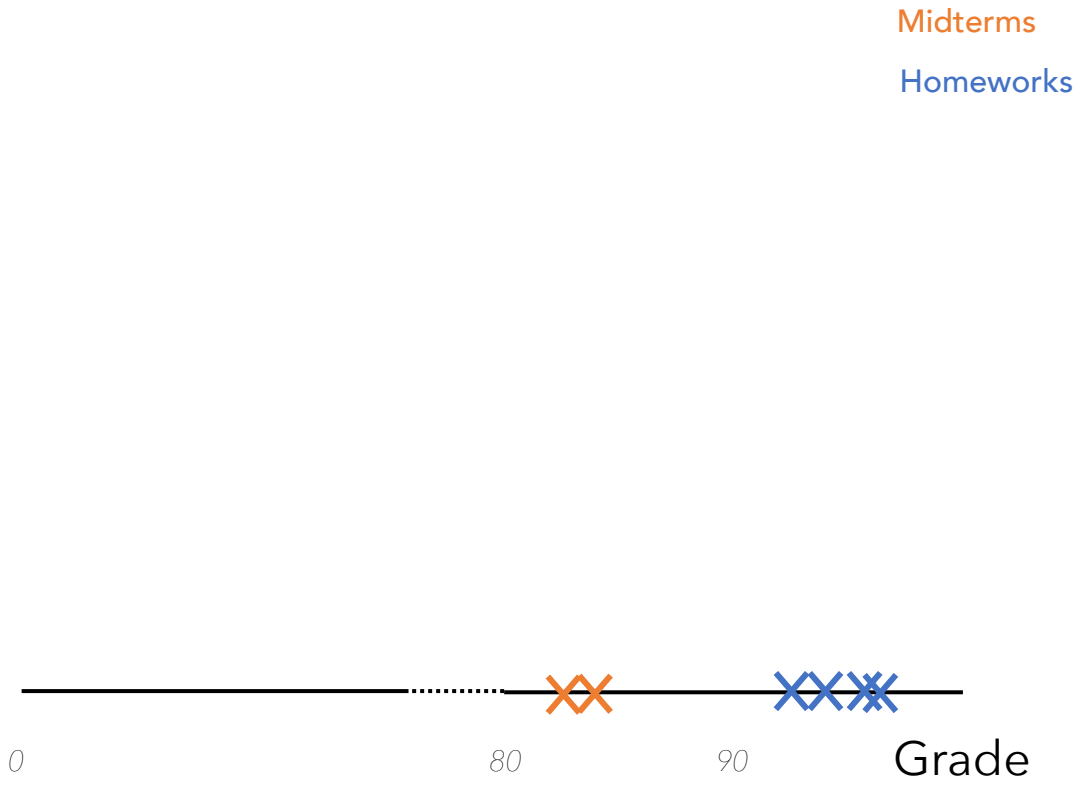
Constant information on performance throughout the semester

Less stress



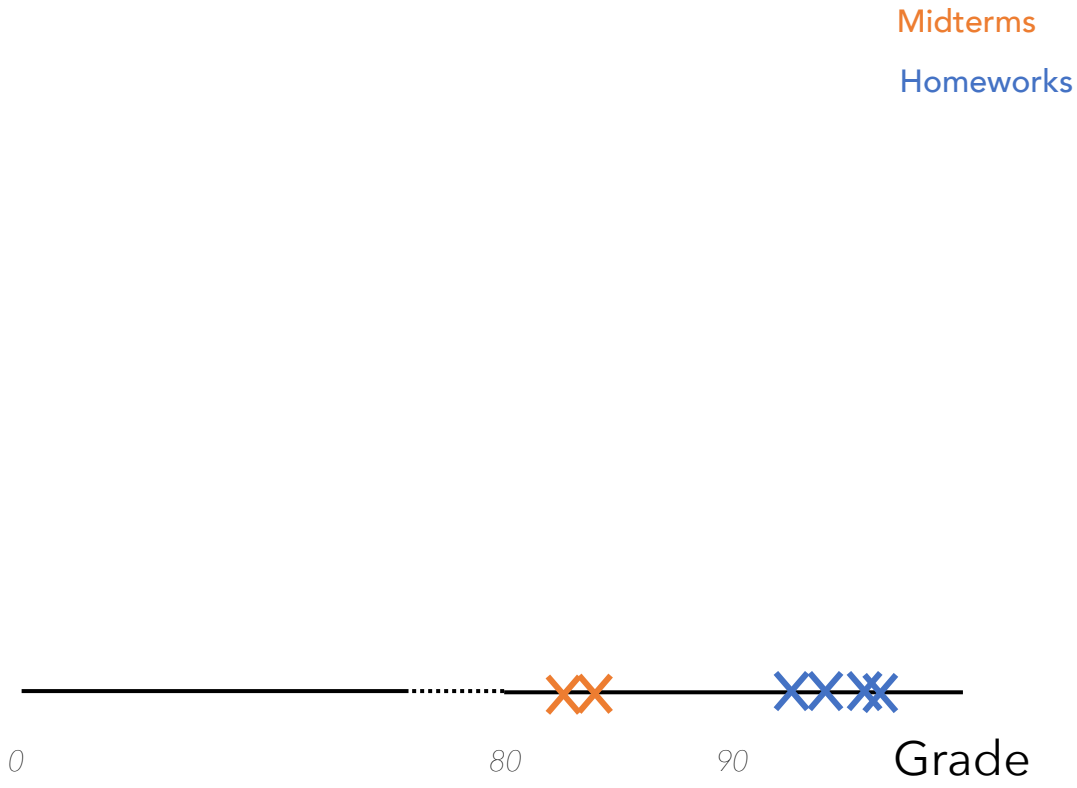
Time saved

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-)

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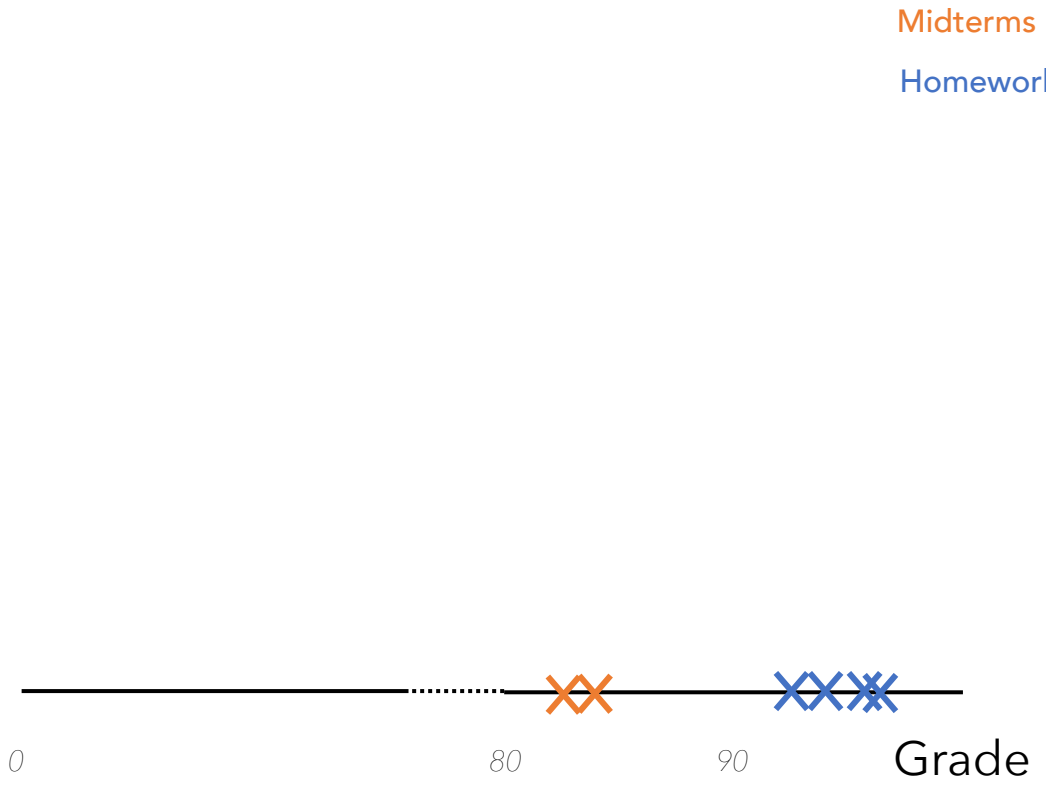

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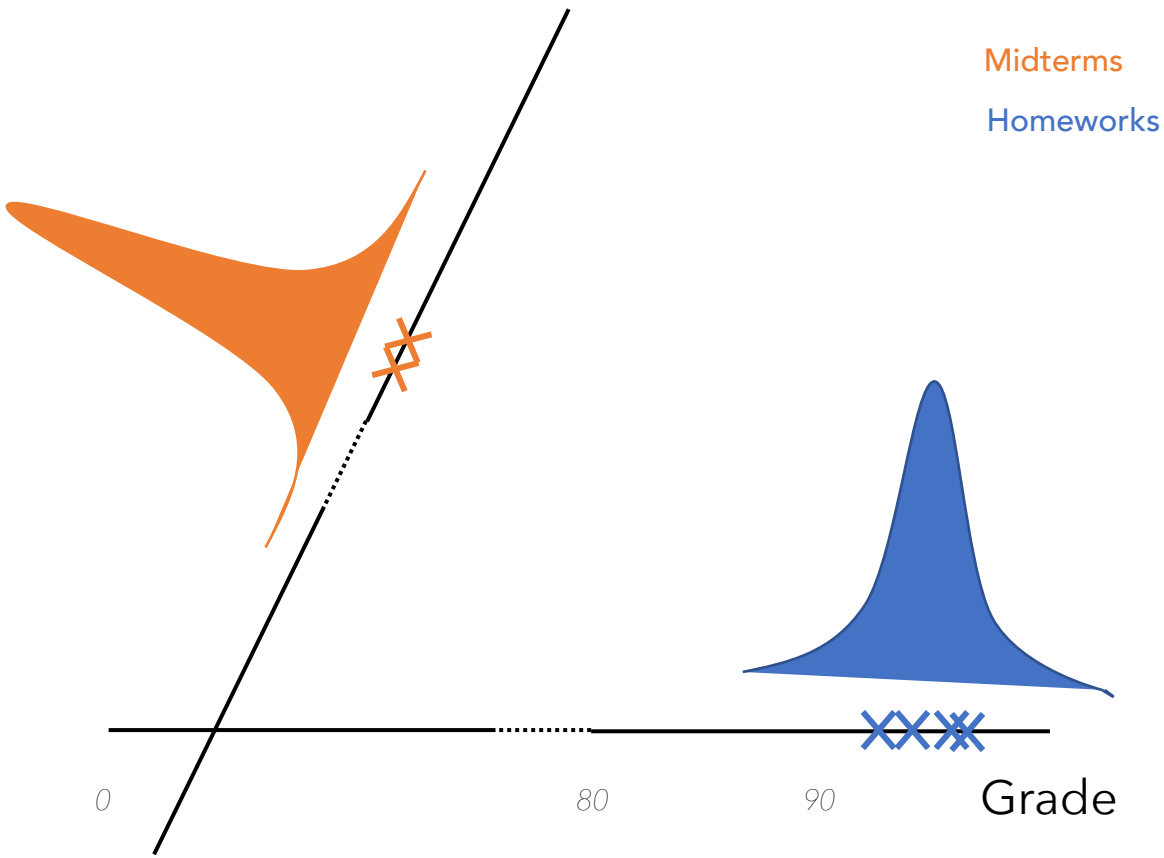
Where c is the next grade level (e.g. 90 : A-)

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

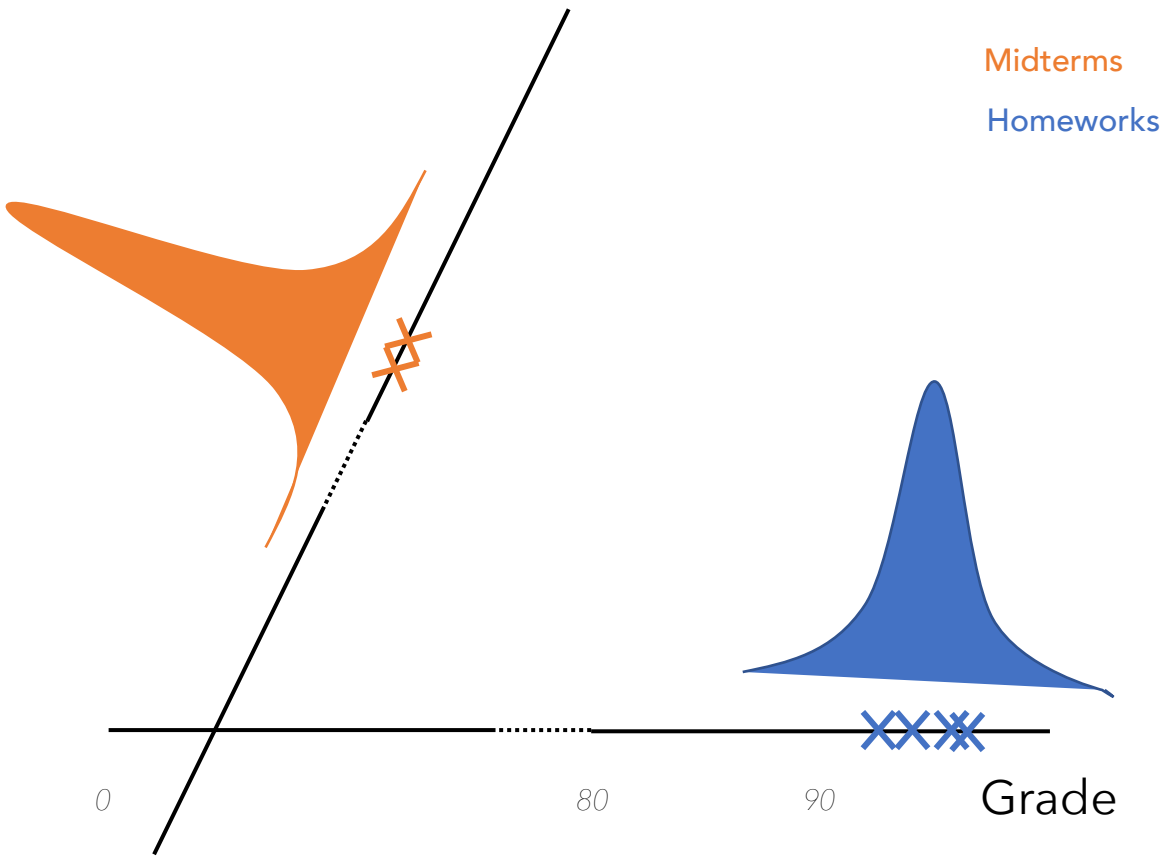
$$f(x;\ \alpha,\beta) = \frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)(\beta)} \cdot x^{\alpha-1} \cdot (1-x)^{\beta-1}$$

$$M \sim 100 \cdot Beta_1(\alpha_1, \beta_1)$$

$$H \sim 100 \cdot Beta_2(\alpha_2, \beta_2)$$

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

How myStudyPal does it

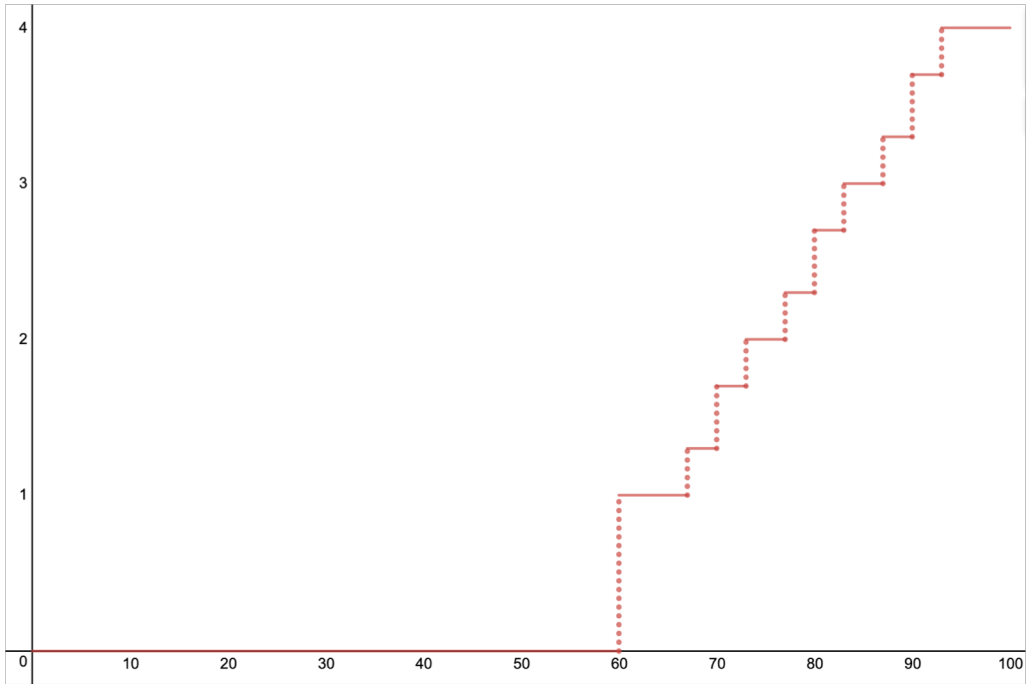


In our demo we used a Gaussian distribution to describe variance along each variable.

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.

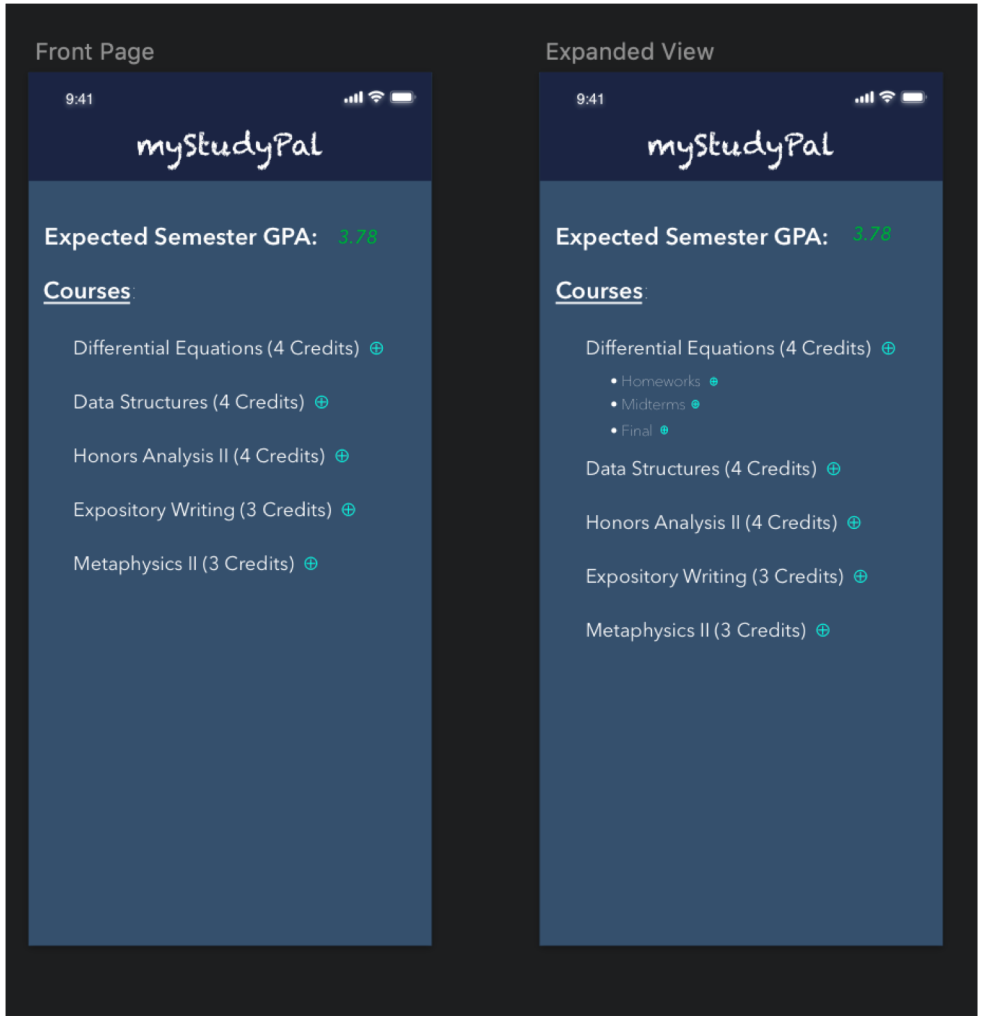
How myStudyPal does it



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