Problem Description:

* UofT students that want good grades but have trouble scheduling their study times
* They have no idea on how to go about it such that it will optimize their grades
* Example:
  + User A received 5 syllabi with assignments, deadlines, quizzes, midterms and exams. User A wants a good grade in all his classes but can’t figure out how to organize his study sessions. That is, what he should be spending time studying on today, tomorrow, …, until the first set of evaluations arrive. He wants a schedule that **fits his work ethic** and balances the time to study for each of his evaluations.

Solution:

* **Create a personalized model from user data** to make predictions on when they should study.
  + How to create the model?
    - Find research papers that show i.e. how number of hours affects performance and what distribution/function it approximates
    - **User-centric study habits modelled by distributions/functions**
      * **Time of day to study**
        + If user specifies “evening” then create a normal distribution around (i.e. 6pm) and sample the times to pick a study event

Or choose the earliest time to study

* + - * + Otherwise, sample randomly or at earliest possible time
        + Helps determine the time frame for study sessions
      * **Number of hours before high stress**
        + Assume it’s sigmoidal/RELU function centered around the user’s input
        + Helps determine the number of hours in each session
    - User data:
      * Current Calendar from Gmail
      * Course
        + Course Difficulty (0-100)
        + Number of study hours per assignment, midterm, quiz, exam
        + Overall Priority

Helps determine which courses to study first

* + - * + Deadlines: Assignment dates, midterms, quizzes, exams

Work that has earlier deadlines get earlier scheduled study sessions

* + - * + Grades for assignments

Used for performance statistics and changing model predictions

* + - * Emotional/Feeling data
        + Stress level
        + Productivity level
* Assign study sessions that is most compatible with the user’s schedule, stress level with respect to performance (i.e. grades and productivity) and other user inputs.
  + For example, if the user is feeling too stressed over the current study schedule, we can use a different model that puts more emphasis on longer periods of break, smaller but more study sessions, more study sessions on certain days than others, etc.
    - We can ask the user to choose which option the user would prefer OR to choose the default
  + As the user keeps inputting data, we can collect this data for performance measures and finding a model that fits the user optimally (polynomial regression?)
* **Update scheduling suggestions** as the user proceeds in the course.
* **Track user statistics, create measures of performance, and compare** with how well other students are doing in the class with similar schedules.
* **Graph work density during the upcoming weeks** so the User can prepare for the worst.
* (if implemented) Professors can view how performance is related with scheduling times and gain insight from measures of data
* **(if implemented) Extra Gimmick: User can create a “personal assistant” character with a preset personality.** The character can be encouraging at times of high stress, or berate the user for not having done work, etc.

Product:

* A UofT student focused (Android / Web App) scheduling app that uses course data and user statistics to optimize a studying schedule that fits stress level/performance of the student.

Market Data:

* Most study scheduling apps just store school data about exams, assignments, grades, etc. (CRUD)
* There is currently no UofT specific app that does personalized scheduling and suggestion on studying events
* There are existing study planners out there:
  + Smart Study Planner
    - <https://play.google.com/store/apps/details?id=br.com.smartstudyplan>
    - Pros:
      * Ease of use
      * User-centric design via Profiles (i.e. Night Owl)
    - Drawbacks:
      * No flexibility in scheduling (can only generate a weekly schedule)
      * Can only distinguish between courses, no notion of tests/assignments
  + Todait
    - <https://play.google.com/store/apps/details?id=com.autoschedule.proto>
    - Pros:
      * Statistics and measures of performance
      * Study session redistribution when you notify that you are behind
      * Includes a distraction free timed space in app (blocks notifications when turned on)
    - Drawbacks:
      * Focused mainly on tests such as ACT, SAT
  + Study Smart
    - <https://play.google.com/store/apps/details?id=com.study.studysmart>
    - Pros:
      * Targeted towards university students
      * Unit of study or work can be set by user (not limited to /pages per day; for example it can be /questions per day, /sections per day, etc)
    - Cons:
      * Simple stats (just divides the total amount by the number of available days you have to work on the material)
      * Up to the user to schedule in the time for the # of pages set by the app
      * Simple tracking
  + Our Implementation
    - Pros:
      * User-Centric Approach that is flexible and iteratively updated
        + Scheduling patterns can vary based on the user’s preference
        + Models are customizable; User can put more weighting into time of day for studying, number of sessions, etc.
        + Reschedules based on number of hours completed and user verification of its completion
      * Statistics and measures of performance
        + Performance measures such as time spent / percentage grade of assignment, time spent in course
      * Gamification (if implemented)
        + Encouragement from a 2D character
    - Drawbacks:
      * UofT specific
      * Requires more user feedback and interaction
      * User must initially set out all deadlines in the syllabus for a given course

Value to the User:

* User does not have to worry about finding appropriate study sessions
* User receives a scheduling that is personalized to specific preferences
* User can receive measures of performance that allow them gain insight or compare with other users
* (if implemented) User can send their performance data to friends and allow them to see how metrics such as how long each assignment took, performance to studying time for an exam, etc.

Time to Implement:

* Models
  + Research: ~ 1 week in finding possible functions
  + Model implementation:
    - A file that contains only the functions of the model ~ 1 week