



Student Simulator

Inspiration

Post-secondary education consists of overwhelming number of choices and opportunities presented to us, but we often have little to no idea which ones are beneficial for us in the long run. As students we often have thoughts like "I wish there was someone to tell me what to do" , "I wish I knew this earlier" , "why did nobody tell me this would happen" at least a couple of times during our student life at University of Calgary.

In the scope of undergraduate students majoring in computer science at University of Calgary, about 60+ courses are being offered in Winter 2023, and a similar number of courses were offered in Fall 2022. Except the courses for 1st years, all other courses have pre-requisites and therefore, if you did not plan accordingly from very 1st term, you might not be able to take a desired course in a senior year.

Then again, there are large number of various clubs and societies one can join at University of Calgary, some might be useful to your academic career, some might enhance your social & personality skills whereas some might contribute to your personal wellbeing. All these aspects are immensely important to a student's undergraduate life. It is impossible to join all these clubs, thus we often ask ourselves, which one should I join? which event should I attend to?

It is not a secret that post-secondary education comes with a hefty price tag. The total amount of funds we can allocate towards tuition & fees constantly fluctuates depending on the number of courses we take, how many hours we work outside of studies or how many scholarships/grants we get, as well as many other factors.

Finally, balancing all these aspects and successfully finishing each term again and again is a battle itself. Our team made this student simulator with the aim of soothing fellow students' **constant cycle of worries and anxieties in each term**

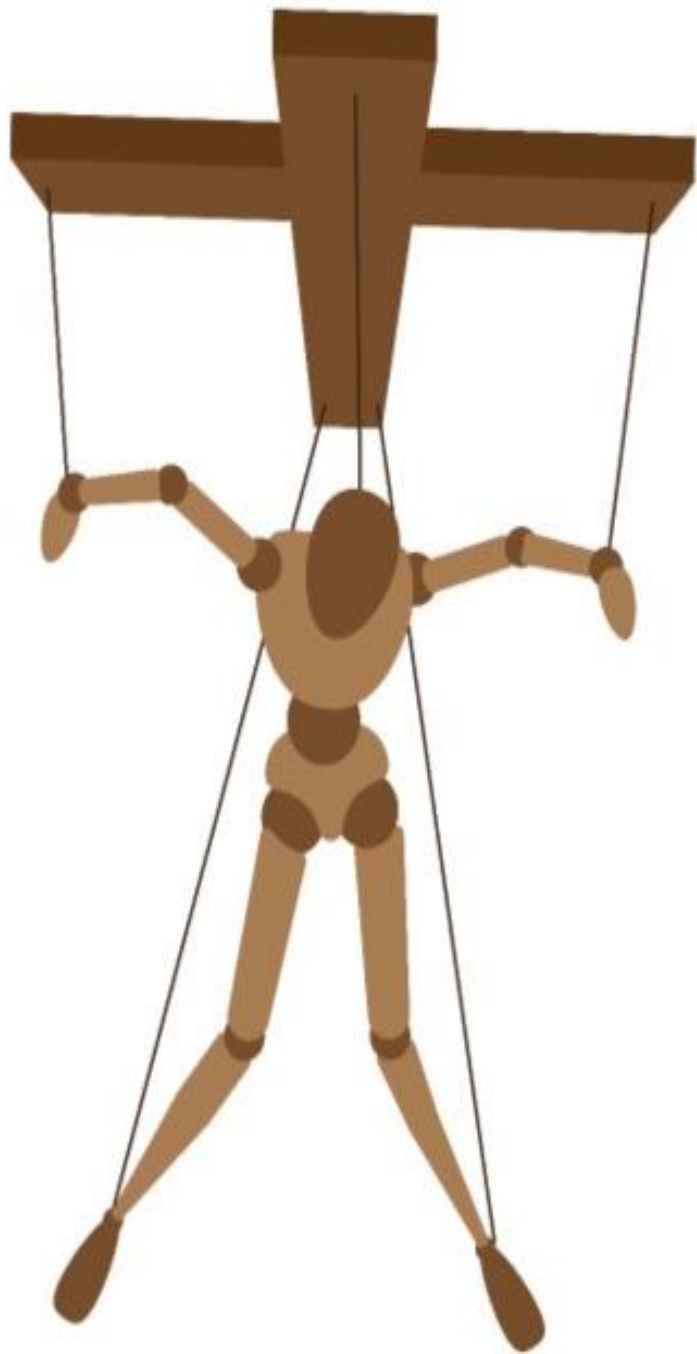
What it does?

In its full potential, our student simulator lets a student choose an end goal (i.e. finishing the degree & getting employed at a FAANG company) and then, take different **academic, wellness, social** as well as **financial decisions**

Then, depending on the decisions they take, the student can determine whether they will be able to reach their goal or if not, they can run the simulator repeatedly to see **what they can do differently** to successfully achieve their end goal.

Our student simulator will help students ease at least some of their worries and go through their post-secondary education journey with more confidence and less stress.

To make this process more fun, our team has **gamified the decision-making process**. Therefore, our end-product is an android game called "Student Simulator 2023"



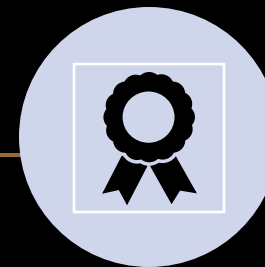
Stats of the Player



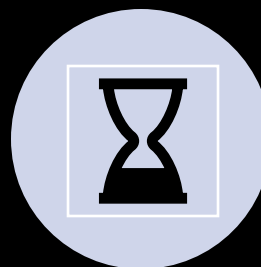
UNDERGRADUATE STUDENT OF
U OF CALGARY, MAJORING IN
COMPUTER SCIENCE



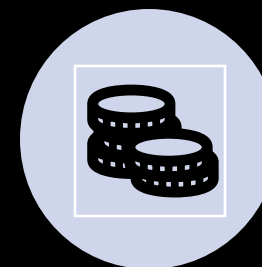
HAS 10,000 COINS TOWARDS
TUITION & FEES



FINAL REWARD IS TO BE
EMPLOYED AT A FAANG
COMPANY



TIME-LINE IS 4-YEARS (12
TERMS)



COINS CAN ONLY BE COLLECTED
IN BATCHES OF 500 BY TAKING
DECISION 6

Decisions available for each player

Decision 1	Joining to university clubs/society
Decision 2	Taking courses/studying
Decision 3	Engaging in physical activities
Decision 4	Engaging in wellness activities
Decision 5	Volunteering in a career-related job/position
Decision 6	Interning/Co-op
Decision 7	Engaging in religious/spiritual activities

Sequence of Actions

- **Step 1**: Student take 1st decision of 1st term
- **Step 2**: Based on the 1st "Decision" 4 features are calculated

A_{11} Net Academic Score

W_{11} Net Wellness Score

S_{11} Net Social Score

C_{11} Net number of coins

- **Step 3**: Student take i^{th} decision of k^{th} term, and corresponding A_{ij} , W_{ij} , S_{ij} , C_{ij} are calculated and stored

Similarly, the steps 1 & 2 are repeated for "n decisions" per term \times 12 terms to determine whether the student successfully get employed at a FAANG company

Assumptions

- Student's only source of academic knowledge is University of Calgary
- International & domestic students pay the exact same amount of tuition & fees per every course they take
- We assume the student doesn't have other expenses except paying tuition & fees
- Also, assume the student doesn't have any other personal relationships to maintain (e.g. significant others, family, friends or pets)

Conditions

- **D6** (interning/co-op) can be repeated twice only in k= 3,6,9,12 terms
- **D2** (taking courses/studying) can be repeated for minimum no of times 3 & maximum no of times 5 in a given term
- **D6** can only be repeated for minimum no of times 0 & maximum no of times 2 in a given term
- However, a student cannot take **D6** & repeat **D2** for 5 times in a given term
- Coins can only be accumulated by **D6** and reduced by **D2**

Decision Rules

	A	W	S	C
Decision 1	0	0	1	0
Decision 2	1	0	0	-1000
Decision 3	0	1	0	0
Decision 4	0	1	0	0
Decision 5	0	0	1	0
Decision 6	0	0	1	+1000
Decision 7	0	1	0	0

Decisions

Degree



Job



A \geq 40, W $>$ 12, S $>$ 12	NA
A \geq 40, W $<$ 12, S $<$ 12	A $<$ 40, W, S can be any score

How we built it

- We built the whole application using Python and Pygame
- Sprites were done using Paint.net
- Some of the images of the sprites are taken off Google
- We used different classes to handle different situation such as a Hud class that handles labels, Config to handle reusable variables, and a sprite class to handle the sprite.
- Tile map is created in the form of a 2D array
- We used git to commit to the repository using different branches
- We do not touch the main branch until the very end so we extend a branch to V1.0.0
- Then we extend from that branch implemented different features before merging our work

What's next for "Student Simulator 2023"

- We expect to **expand the 7 decisions into micro levels**, such as instead of "taking a course", the player can choose which specific course they will take (e.g. CPCS 453), instead of "engaging in a club activity", the player can choose which specific club they will join (e.g. CSUS, CSGS, SUMC, etc.).
- We would like to let our **accomplished alumni** use our student simulator and collect data on the decisions they made during their undergrad which led them to where they are today.
- After collecting enough past data , we expect to tune our algorithm using both **prior knowledge** and **past data**. This tuning process will lead Student Simulator 2023 to predict whether the student will reach their end goal, more accurately based on the decisions they take within the game.