Homework 5 Self-Evaluation

2/27/2024

(Late) **5/5** Points

| Attempt 1 ⌄ | ◯ | Review Feedback **2/29/2024** | Attempt 1 Score: **5/5** | 🗨 Add comment |

Anonymous grading: **no**

Unlimited Attempts Allowed

2/29/2024

⌄ **Details**

Please answer the following questions about the code you submitted to the **first** submission deadline (i.e., not the resubmission, and not your work in progress for the resubmission). If you overwrote it locally, you can redownload your submission from Canvas.

For each question, answer either with the line number (or a range of line numbers) that is relevant to the question, or with "no" if your code does not do what the question is asking about. *Your answer to a question will get 1 point if your answer accurately answers the question and you did not answer "no"; your answer will get a 0 in all other cases.*

Make sure to **double-check your answer and line numbers** to make sure they are correct and also that they are referencing the correct version of the file (see above). To ensure consistency in grading across all students, **your line numbers MUST correspond to the relevant lines of code, otherwise the question will get a 0** (even if the relevant code lies elsewhere).
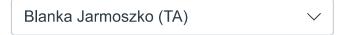
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1. Percolating down should only traverse a single path. Does yours? Answer with the line where you continue percolating down to the smaller child's position.
2. `find_min` should take constant time. Does yours? Answer with the line where you access the minimum element.
3. Do you have a unit test that builds a binary heap with duplicate elements? If so, on which line? A test for `heap_sort` is fine too.
4. Did you write a helper function for swapping vector elements instead of repeating that code in multiple places? If so, which lines is this helper at?

5. *For this last question, answer with a short paragraph. We will not be looking for a specific correct answer, but rather for thoughtfulness and reflection.*

   When we write algorithms, we attempt to encode human preferences and decisions. However, in the process, we may be inducing biases or other issues into the algorithm, while giving an appearance of objectivity and legitimacy; as we hear too often: "the computer said so, so it must be right".

When you wrote your `is_better?` function to compare two colleges, you made decisions regarding which aspects of a college are more important than others, and how much each one matters. **First**, explain the design of your `is_better` implementation and justify your decisions. **Second**, what additional criteria would you take into consideration to design a better ranking? Be concrete.

⌄ **View Rubric**

Select Grader

Blanka Jarmoszko (TA)   ⌄

Self-Eval 22-23 (2)

Criteria	Ratings		Points
Q1 view longer description	**1 pts** Got it	**0 pts** Missing/Incorrect	1 / 1 pts
Q2 view longer description	**1 pts** Got it	**0 pts** Missing/Incorrect	1 / 1 pts
Q3 view longer description	**1 pts** Got it	**0 pts** Missing/Incorrect	1 / 1 pts
Q4 view longer description	**1 pts** Got it	**0 pts** Missing/Incorrect	1 / 1 pts
Q5 view longer description	**1 pts** Got it	**0 pts** Missing/Incorrect	1 / 1 pts

Total points: 5

1. loop at 55-68
2. 45
3. 115 (duplicate insertions at 121 and 122)
4. 91-94
5. **Design:** It has salary, and incoming SAT score and GPA in the numerator (to reward these), and student-to-faculty (STF) ratio, tuition and acceptance rate in the denominator (to penalize high STF ratios, tuition and acceptance rates). Postgraduate salary is weighted at 1.5, and all the other factors at 1. SAT and GPA are set to a nonzero minimum so that in case some college has the lowest possible freshling GPA/SAT, the is_better? score itself doesn't become zero; the college should still be comparable to other colleges based on other factors.

   Justification: A driven peer group is essential to intellectual development, which is why SAT, GPA and low acceptance rate is rewarded. Low tuition makes a college more affordable (and more

diverse), which is desirable. A high STF ratio, on the other hand, means less personal attention for each student, which seems bad. Finally, though college is a place for personal growth, for many it functions more as a place to get credentials and skills for a job. So, a high postgraduate salary is taken into consideration very favorably (with a 1.5x weight). The college's geographical setting is not taken into consideration as preferences here are highly personal.

Other factors: A more granular ranking of colleges for specific majors makes more sense. For this, research output by faculty should be taken into consideration. The number of high-impact journal citations in the past year by faculty in the interquartile range (not *all* the faculty, to avoid outliers) divided by the number of undergrads could work. Unlike the US News though, we should not take into consideration research *expenditure* (which could reward wasteful spending) or peer reviews (which can be gamed).

Additionally, high happiness/life satisfaction rates in the student body and diversity in race/income/etc (measured by squared deviations from a randomly sampled student body from all over the US, for example) could be rewarded.