

Simulated Annealing Report

20/03/22

OVERVIEW

The program came together nicely. I built the knapsack as an object that enforces the rules and functions. The functions of annealing, calculating weight and utility score, and penalizing are handled by the knapsack object. At first I had the penalize function as a separate method within the knapsack object but found that it was something I was going to want to do every time I calculated utility so incorporated it into that method.

GOALS

1. Find the arrangement of items to produce optimal utility x weight
2. Do the above using simulated annealing

SPECIFICATIONS

I started off with an list of requirements. From there I created a rough draft for a solution. (See solution proposal) At first I was going for a dictionary but that didnt quite make sense to switched to a list of list. First created the knapsack and then the annealing. I tested the knapsack functions and had to make a few changes there with the rearrange method.

It took a long time to first run it but as I cut back on some for loops it improved the time a lot. For some reason my utility score and weight would skyrocket and stay up in the thousands. It seemed to be due to the penalty but not messing with it fixed however when the weight got above 500 you start seeing the utility diff trigger a change even when it shouldnt. Then when I was finishing up my IDE stopped showing printed statements. The console moves like its being printed but nothing displayed. I spent the remainder of my time trying to figure that out.

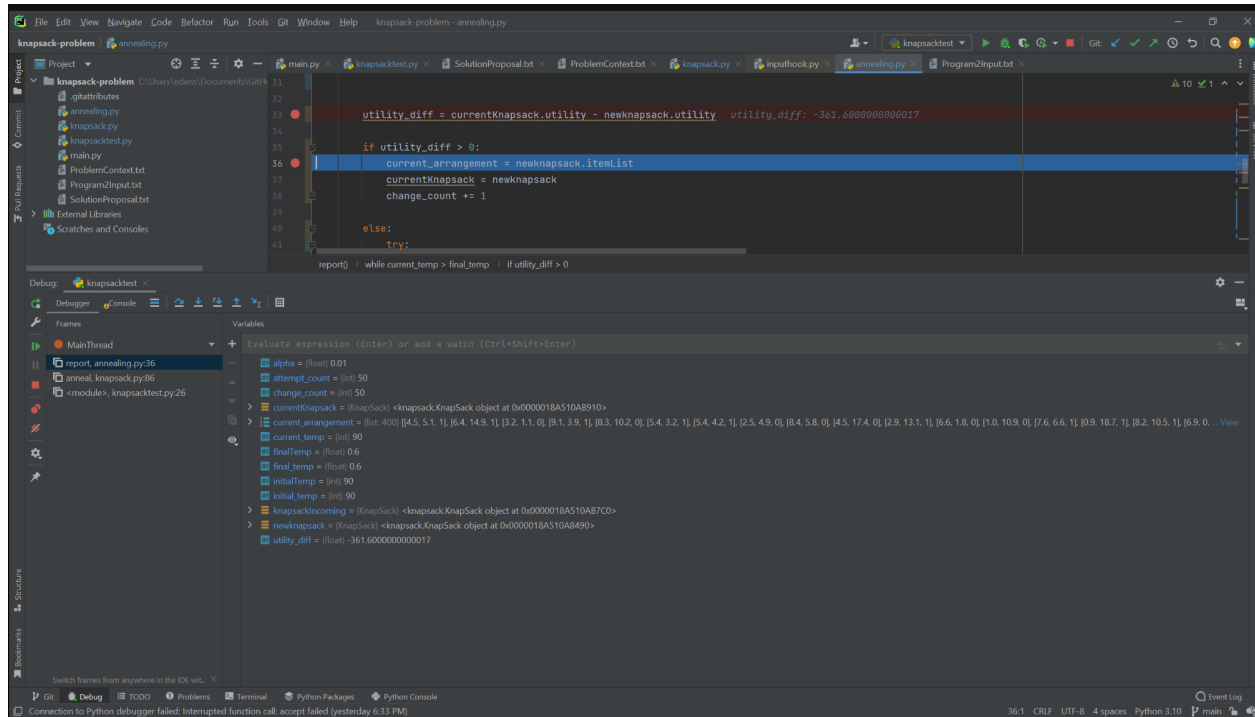


Image 1 ScreenShot During Debugging (Note line 33 says utility difference is -361 but we are stopped on break 36, meaning the evaluation of the if was passed...)

Work Cited

Alvarenga, Cesar William. "How to Implement Simulated Annealing Algorithm in

Python." *Medium*,

[https://medium.com/swlh/how-to-implement-simulated-annealing-algorithm-i
n-python-ab196c2f56a0](https://medium.com/swlh/how-to-implement-simulated-annealing-algorithm-in-python-ab196c2f56a0). Accessed 20 March 2022.