Project-1
Stack, Queue and Deque Applications

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1. INTRODUCTION

In this project, I implemented my own class of Tower of Hanoi as well as a solving it using both iterative and recursive processes, as well as some real life example and solution using queue and deque.

2. BACKGROUND (optional)

I used python's sleep function as well as ittertools' zip_longest in order to slow down and show the process of solving the Tower of Hanoi in a command line interface

3. DESIGN & IMPLEMENTATION

For Tower of Hanoi I consult the wikidepia on the problems to get an understanding of the game and create a solution for it.

For recursive solution I uses 4 variable, n for the number of disks, s for rod 1 a.k.a the source where all the disk are originally, a for auxilery a.k.a the middle rod, rod 2, and finally d for rod 3, the destination, the function then recursively lowers n by 1 and calling itself twice, and switch s, d, a on it's 2nd call.

4. RESULTS / SAMPLE OUTPUTS

tower of hanoi:

Starts:

Ends:

real world situation and using queue to solve:
situation tldr: James is stuck in traffic and this function is used to calculate how much time total does it take for James to get out of traffic.

```
Press Enter to continue
[1, 2, 3, 4, 5, 6, 7, 8, 9, 'James']
Total Seconds: 41
[2, 3, 4, 5, 6, 7, 8, 9, 'James']
Total Seconds: 84
[3, 4, 5, 6, 7, 8, 9, 'James']
Total Seconds: 132
[4, 5, 6, 7, 8, 9, 'James']
Total Seconds: 178
```

deque application (browser history):

```
Adding new website
browser_history = []
browser_history = [Youtube.com | ]
browser_history = [Youtube.com, Google.com | ]
Go back website
browser_history = [Youtube.com, Google.com, Amazon.com | ]
browser_history = [Google.com, Amazon.com | Youtube.com]
browser_history = [Amazon.com | Google.com, Youtube.com]
```

5. **CONCLUSION**
   - What have you learnt from this project?
     I've learn a lot from trying to solve Tower of Hanoi, recursively and iteratively, for example: how to solve Tower of Hanoi iteratively.
     As well as implementation of deque, queue, and stacks.

   - What ways you can expand this project?
     I can expand this project further by creating an actual class for browser history as well as real life situation where I would be using stack instead of queue.

6. **REFERENCES**
   https://en.wikipedia.org/wiki/Tower_of_Hanoi