1. Construct a realistic example of prediction(s) served well by TD Learning
2. Describe your example with sufficient detail to warrant the use of TD
3. Identify and justify the granularity (time step, learning rate...) of updates
4. ***Why is TD Learning preferred over QLearning?***
5. **Do not use either of the two, classic examples given below**

**Classic Examples**

1. **Weather (Wikipedia)**  
   Predictive value of weather forecast improved when intermediate values are updated upon receipt of new data (weather observations). For example, forecast a week out, that is not updated, will likely not be as accurate as one that is updated daily.
2. **Commute Time**  
   Estimating, at the beginning of a commute, the expected time of a trip, will likely not be as accurate as an estimate that recalculates at specific intermediate steps (I5, I90 bridge, express

**My Example: Predicting Stocks Market Trends**

A trader wants to predict the future prices of stocks X, Y, Z based on real time updates. Instead of relying on historical data, the trader refines predictions using real time data throughout the day.

TD Learning is good because it makes incremental updates. It also refines predictions continuously. TD Learning also works because the environment is non-stationary (past data is insufficient)

* Time step (t): every minute
* Learning Rate (alpha): between 0.1 and 0.5. We want the model to adapt pretty fast without overfitting to noise
* Discount Factor (gamma): close to 1, because future rewards are important in decision making (by future rewards, we mean stock prices later in the day)

Why TDL over QL?

* Because stock prices exist in a continuous space making value function approximation more fitting than QL. TDL is faster than QL due to bootstrapping.