1. Describe any implementation choices you made that you felt were important. If you implement anything beyond the assignment as written, please be sure to discuss it. Clearly explain any aspects of your program that aren't working. Mention anything else that we should know when evaluating your work.

On line linear regression works with tiny case and other manually constructed cases. It does not work with class tool though as I keep getting index out of bound errors, I suspect this is due to weights and test instances attributes being different lengths due to input parsing confusion, but I could not figure out how to fix it. KNN works great though.

2. What can you say about the the time and space complexity of your program?

KNN is simply O(n*a) where n is number of training points and a is number of attributes as all training data must be stored and checked.

On-line regression: every update costs the length of attributes of O(a) so for n training points it would be O(n*a)

3. For each algorithm you implemented, describe a learning problem that you think it will perform poorly on and explain why.

Online Linear Regression with LMS: essentially anything that's very nonlinear, this could be something like tolerance to drugs which is logarithmic or logistic population growth in ecosystems, especially when there are factors that make it so extrapolating can be outright incorrect(ie ecosystem collapse).

KNN: Something with biased classes, this could be something like fraud detection. Most transactions are valid with varying circumstances, this can bias the nearest neighbors to be valid transaction as the attribute range of them is broad causing invalid transactions to be overlooked.

4. What suggestions do you have for improving this assignment in the future?

Better error messages from class-tool or make it easier for printing statements for debugging.