

**95-828: Machine Learning for Problem Solving****Case Study Phase 2: Data Cleaning, Preparation, & Exploration****Team Members:** Ghazal Erfani (gerfani), Dan Lesser (dlesser), Joe Standerfer (josephst)

Responses to Questions 1-6 are in the attached .ipynb file.

7.

				Average Return			
Grade	% of loans	% Default	Average Interest	M1	M2	M3 (i=0.002)	M3 (i=0.005)
A	15.95	7.54	7.22	0.0363	0.0144	0.0192	0.0662
B	28.60	15.87	10.85	0.0450	0.0116	0.0174	0.0642
C	28.33	26.15	14.08	0.0455	-0.000006	0.0093	0.0547
D	15.77	34.30	17.57	0.0478	-0.0057	0.0045	0.0488
E	7.79	42.92	20.81	0.0495	-0.0147	-0.0035	0.0390
F	2.80	49.01	24.59	0.0541	-0.0194	-0.0088	0.0325
G	0.76	54.28	27.31	0.0481	-0.0354	-0.0226	0.0168

- (i) See chart above.
- (ii) See chart above. As expected, the average default rate increases as grades lower.
- (iii) See chart above. Overall, it seems that the average interest increases as grades lower. This is expected since investments of lower grade and higher risk have higher interest rates.
- (iv) See chart above.
- (v) These numbers do not surprise me. As expected, average percentage return per grade for M2 and M3 (both rates) generally decreases as grade lowers. However, average percentage return per grade for M1 tends to increase as the grade lowers. This is because M1 is an optimistic calculation since it assumes that the investor can immediately invest in another loan with the same return. In reality, this will likely not happen. If I had to invest in one grade only, I would likely invest in grade A as it has the highest average returns for measures M2 through M3.