CS573_assignment2_XiaofengOu

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1 Preprocessing

Quotes removed from 8316 cells
Standardized 5707 cells to lower case
Value assigned for male in column gender: 1
Value assigned for EuropeanCaucasian-American in column race: 2
Value assigned for LatinoHispanic American in column race_o: 3
Value assigned for law in column field: 121
Mean of attractive_important: 0.22
Mean of sincere_important: 0.17
Mean of intelligence_important: 0.2
Mean of funny_important: 0.17
Mean of ambition_important: 0.11
Mean of shared_interests_important: 0.12
Mean of pref_o_attractive: 0.22
Mean of pref_o_sincere: 0.17
Mean of pref_o_intelligence: 0.2
Mean of pref_o_funny: 0.17
Mean of pref_o_ambitious: 0.11
Mean of pref_o_shared_interests: 0.12

2 Visualizing interesting trends in data

(i) I observe that males favor attractive while females favor ambition. For other attributes, they are pretty close.

(ii) I observe that the trend is that higher scores mean high probability of success in having a chance to a second date.

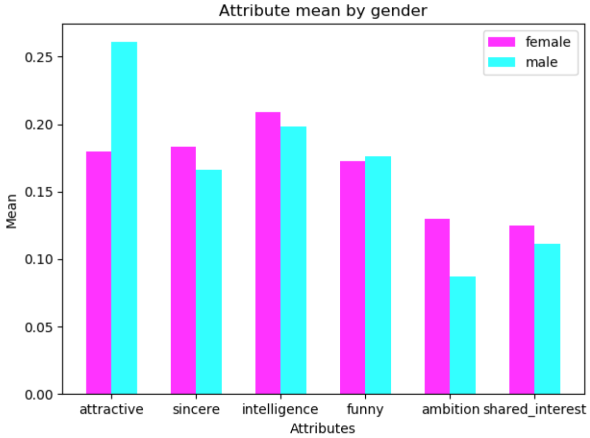
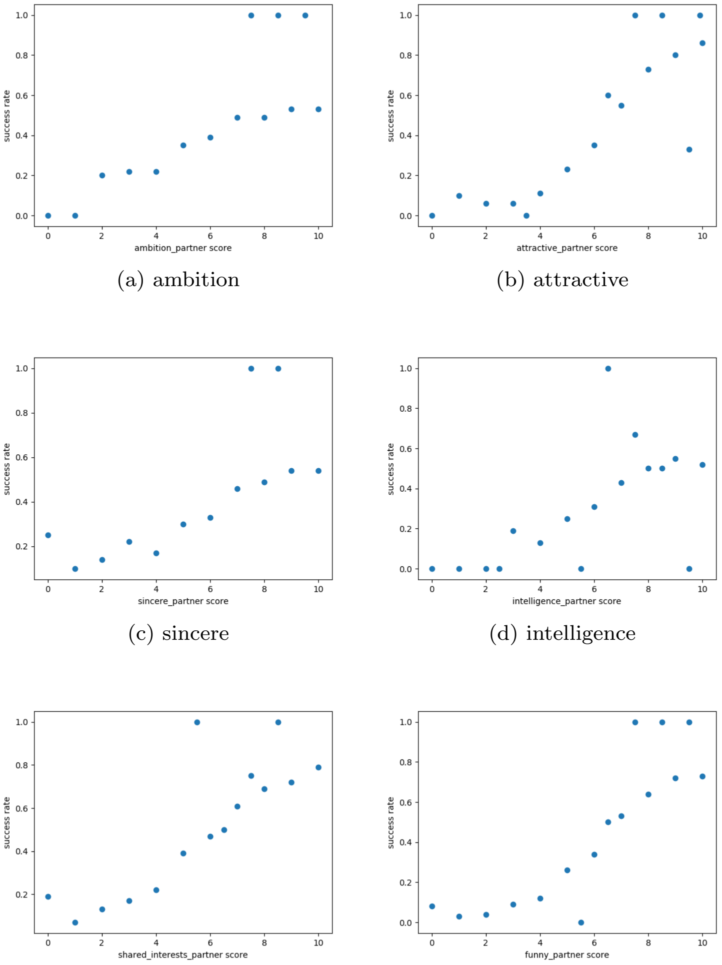


Figure 1: Bar plot of 2(i)

3 Convert continuous attributes to categorical attributes

age: [3710, 2932, 97, 0, 5]
age_o: [3704, 2899, 136, 0, 5]
importance_same_race: [2980, 1213, 977, 1013, 561]
importance_same_religion: [3203, 1188, 1110, 742, 501]
pref_o_attractive: [4333, 1987, 344, 51, 29]
pref_o_sincere: [5500, 1225, 19, 0, 0]
pref_o_intelligence: [4601, 2062, 81, 0, 0]
pref_o_funny: [5616, 1103, 25, 0, 0]
pref_o_ambitious: [6656, 88, 0, 0, 0]
pref_o_shared_interests: [6467, 277, 0, 0, 0]
attractive_important: [4323, 2017, 328, 57, 19]
sincere_important: [5495, 1235, 14, 0, 0]
intelligence_important: [4606, 2071, 67, 0, 0]
funny_important: [5588, 1128, 28, 0, 0]
ambition_important: [6644, 100, 0, 0, 0]
shared_interests_important: [6494, 250, 0, 0, 0]
attractive: [18, 276, 1462, 4122, 866]
sincere: [33, 117, 487, 2715, 3392]
intelligence: [34, 185, 1049, 3190, 2286]
funny: [0, 19, 221, 3191, 3313]
ambition: [84, 327, 1070, 2876, 2387]
attractive_partner: [284, 948, 2418, 2390, 704]
sincere_partner: [94, 353, 1627, 3282, 1388]
intelligence_partner: [36, 193, 1509, 3509, 1497]



(a) ambition

(b) attractive

(c) sincere

(d) intelligence

(e) shared_interests

(f) funny

Figure 2: Attributes v.s. success rate

funny_partner: [279, 733, 2296, 2600, 836]
ambition_partner: [119, 473, 2258, 2804, 1090]
shared_interests_partner: [701, 1269, 2536, 1774, 464]
sports: [650, 961, 1369, 2077, 1687]
tvsports: [2151, 1292, 1233, 1383, 685] exercise: [619, 952, 1775, 2115, 1283]
dining: [39, 172, 1118, 2797, 2618]
museums: [117, 732, 1417, 2737, 1741]
art: [224, 946, 1557, 2500, 1517]
hiking: [963, 1386, 1575, 1855, 965]

gaming: [2565, 1522, 1435, 979, 243]
clubbing: [912, 1068, 1668, 2193, 903]
reading: [131, 398, 1071, 2317, 2827]
tv: [1188, 1216, 1999, 1642, 699]
theater: [288, 811, 1585, 2300, 1760]
movies: [45, 248, 843, 2783, 2825]
concerts: [222, 777, 1752, 2282, 1711]
music: [62, 196, 1106, 2583, 2797]
shopping: [1093, 1098, 1709, 1643, 1201]
yoga: [2285, 1392, 1369, 1056, 642]
interests_correlate: [18, 758, 2520, 2875, 573]
expected_happy_with_sd_people: [321, 1262, 3292, 1596, 273]
like: [273, 865, 2539, 2560, 507]

4 Implement a Naive Bayes Classifier

- Training accuracy: 0.78

- Test accuracy: 0.75

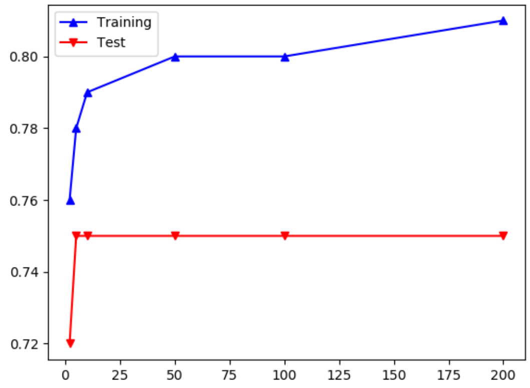


Figure 3: bin number v.s accuracy

- Increasing bin number only has a limiting amount of effect on the accuracy of the model on test set, while it performs slightly better on training set.

- One can see that with low fraction of training data used as training samples, the model is going to overfit the data. But if we increase the fraction, test accuracy will increase and training accuracy will decrease, i.e, reduce overfitting.

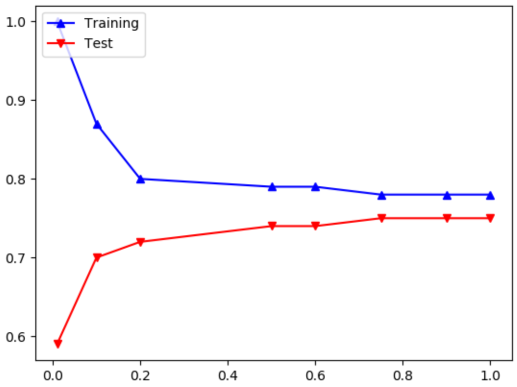


Figure 4: t_fraction v.s accuracy