Ayush Garg
PUID: 0033794803 **Homework 2** CS 57300

1. Q1

Output obtained:

```
Quotes removed from 8316 cells
Standardized 5707 cells to lower case
Value assigned for male in column gender: 1
Value assigned for European/Caucasian-American in column race: 2
Value assigned for Latino/Hispanic 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. Q2

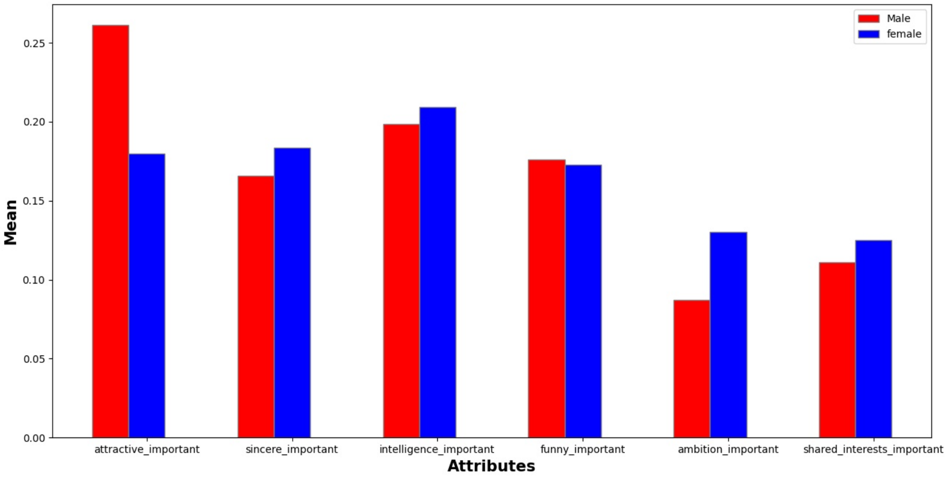
1. This plot helps us to analyze how females and males valus different attributes in the 'preference scores of participant' set in their partners differently.

   Males prefer these characteristics in their counterparts as compared to females:

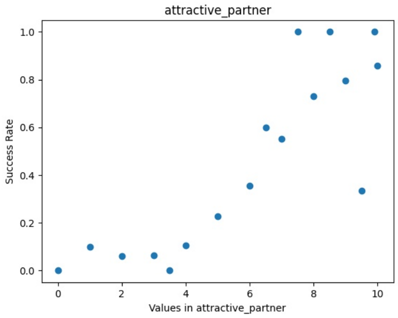
   - Attractiveness
   - Funny

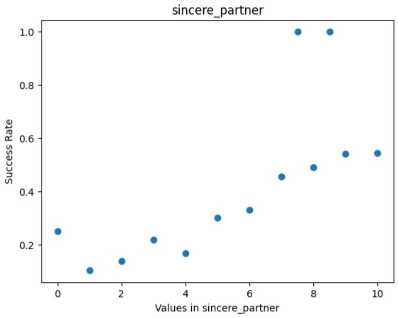
   Females prefer these characteristics in their counterparts as compared to males:

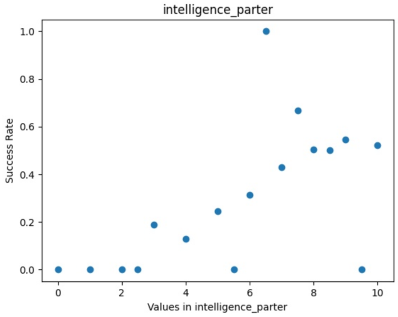
   - Sincerity
   - Intelligence
   - Ambition
   - Shared interests

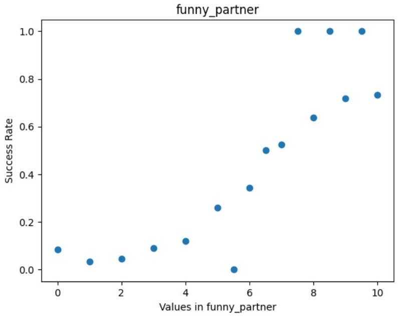


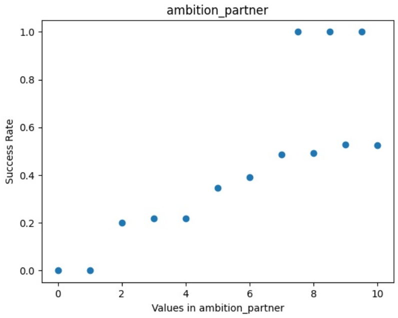
2. Here are the six scatter plots obtained:
   These plots help us to find the relation between rating value for each attribute and the corresponding chances of getting a second date with that given value.
   We can observe from the graphs that features like attractive and shared_interests have higher correlation between the success rate and the rating value.
   Remaining features also show an increase in the success rate with the increase in the rating value but the rate of increase is not that high.
   In each of the plots, we see some values which do not follow the usual trend. This might be because there are not much data samples corresponding to that value.
   For eg:
   attractive_partner: value 9.5
   sincere_partner: values 7.5 and 8.5
   intelligence_partner: value 6.5
   funny_partner: values 7.5, 8.5 and 9.5
   ambition_partner: values 7.5, 8.5 and 9.5
   shared_interests_partner: values 5.5 and 8.5

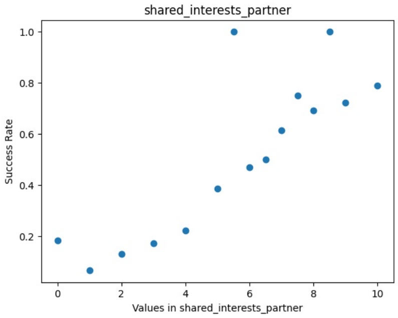












3. Q3

Output obtained:

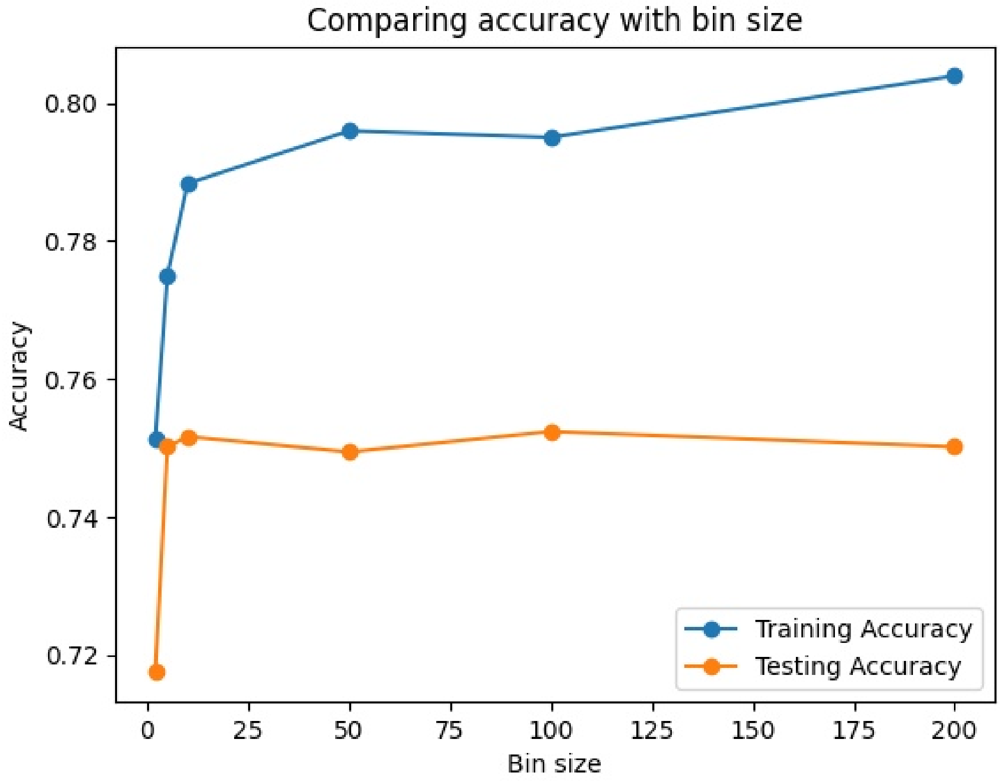
```
age: [3710 2932 97 0 5]
age_o: [3704 2899 136 0 5]
importance_same_race: [2980 1213 977 1013 561]
importance_same_religion: [3203 1188 1110 742 501]
pref_o_attractive: [4333 1987 344 51 29]
```

```
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_parter: [ 36 193 1509 3509 1497]
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. Q5

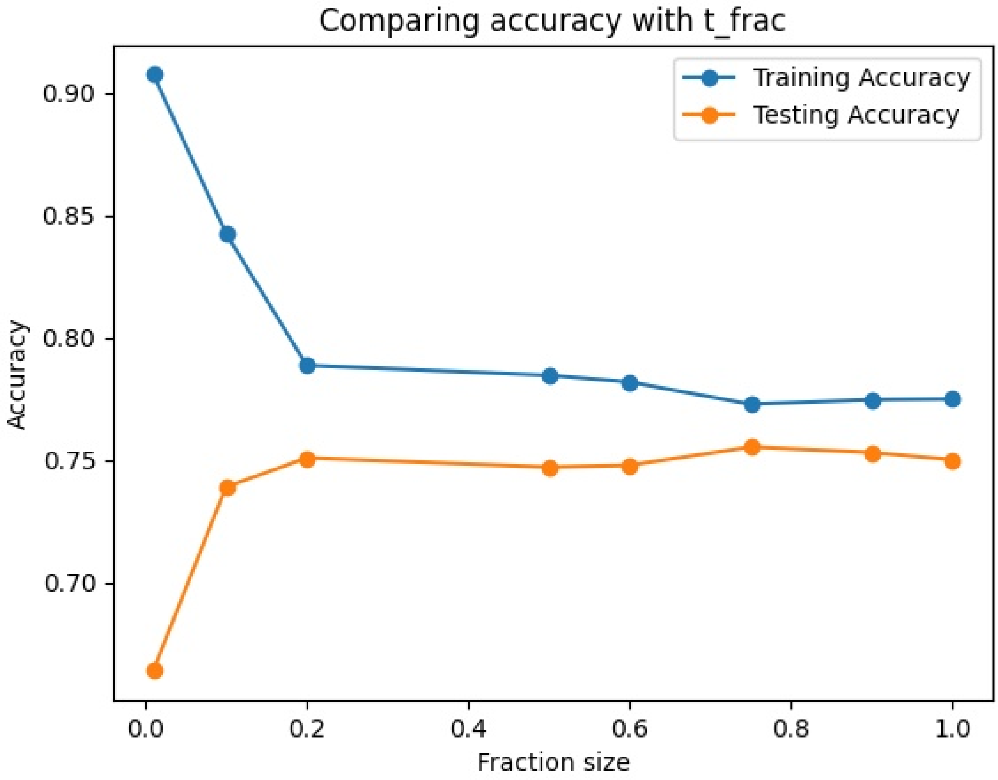
1. Output obtained:
   Training Accuracy: 0.77
   Testing Accuracy: 0.75

2. This plot shows us the variation in training and testing accuracy with change in the size of bins.
   We can infer from the plot that training accuracy and testing accuracy show significant change when the bin size changes from 2 to 5. However, beyond that, increase in the number of bins does not have much effect on the testing accuracy but the training accuracy increases a bit.



3. This plot shows us the variation in training and testing accuracy with change in the fraction of dataset being used from trainingSet.csv file.
   We get a very high training accuracy when the t_frac = 0.01. This is because the

number of datapoints in the set is quite low.
We infer from this plot that the best fraction size comes to be 0.75 as we achieve highest test accuracy for that fraction along with a reasonable amount of training accuracy.


Comparing accuracy with t_frac
Training Accuracy
Testing Accuracy
Accuracy
Fraction size