FINDING THE CORRECT AUDIENCE ONLINE

General Assembly Data Science Course Final Project by Yuani Chen . 5 August 2017

Every Consumer is Unique

Audience of ONE

Programmatic marketing leverages rich, detailed insights allowing you to know your distinctive consumer. This knowledge informs strategy, implementation, optimization and a smarter way to spend on Ads.

Why does it matter?

Not Knowing Your Audience is a Big Problem

Fragmented view of data

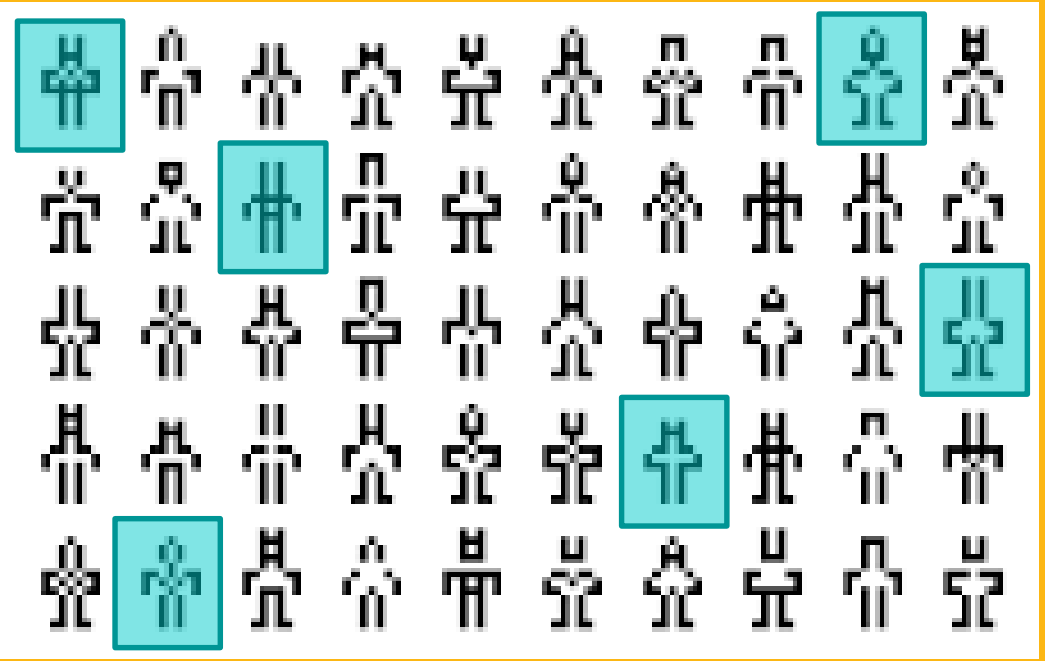
Targeting the **WRONG** person
at the **WRONG** time

Wasted Ad Spend

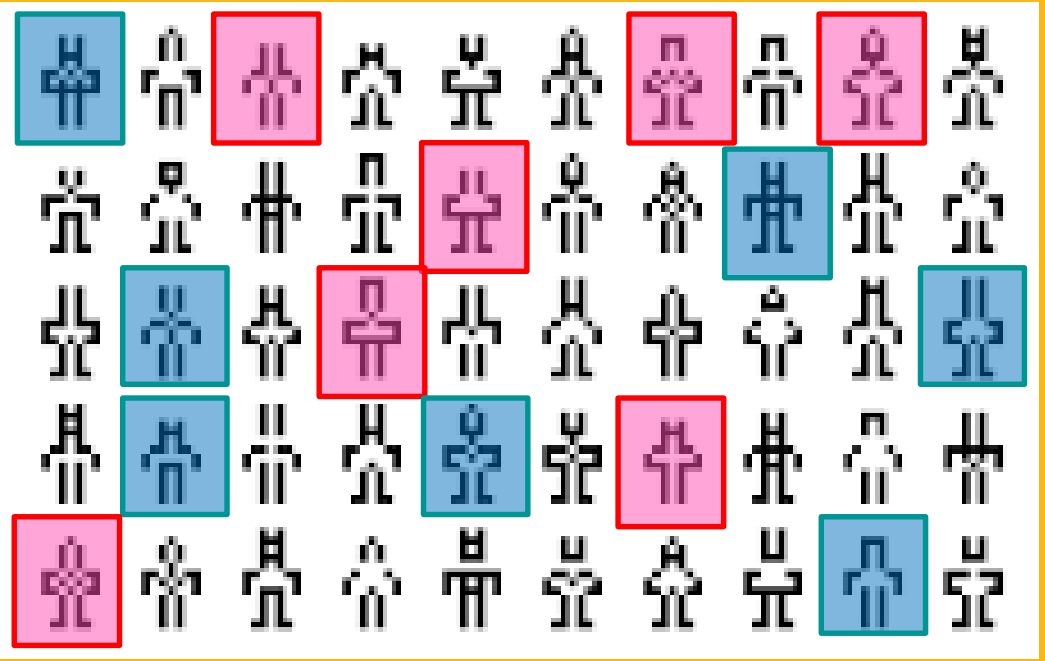
Lower Returns on Investment (ROI)

3rd Party Data Providers profile users online providing Advertisers with richer Data

CAN WE SEGMENTING HIGH POTENTIAL CUSTOMERS VS LOW POTENTIAL CUSTOMERS?

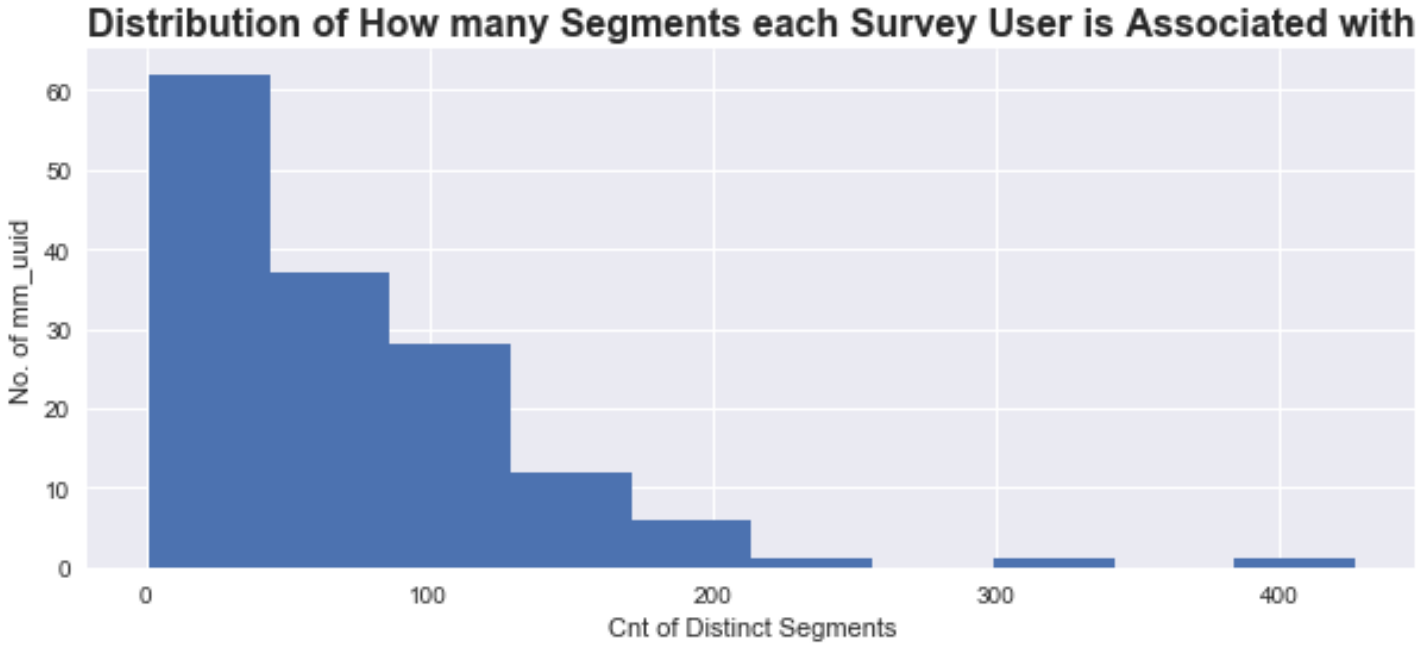


CAN WE SEGMENTING MALE VS FEMALE USERS?

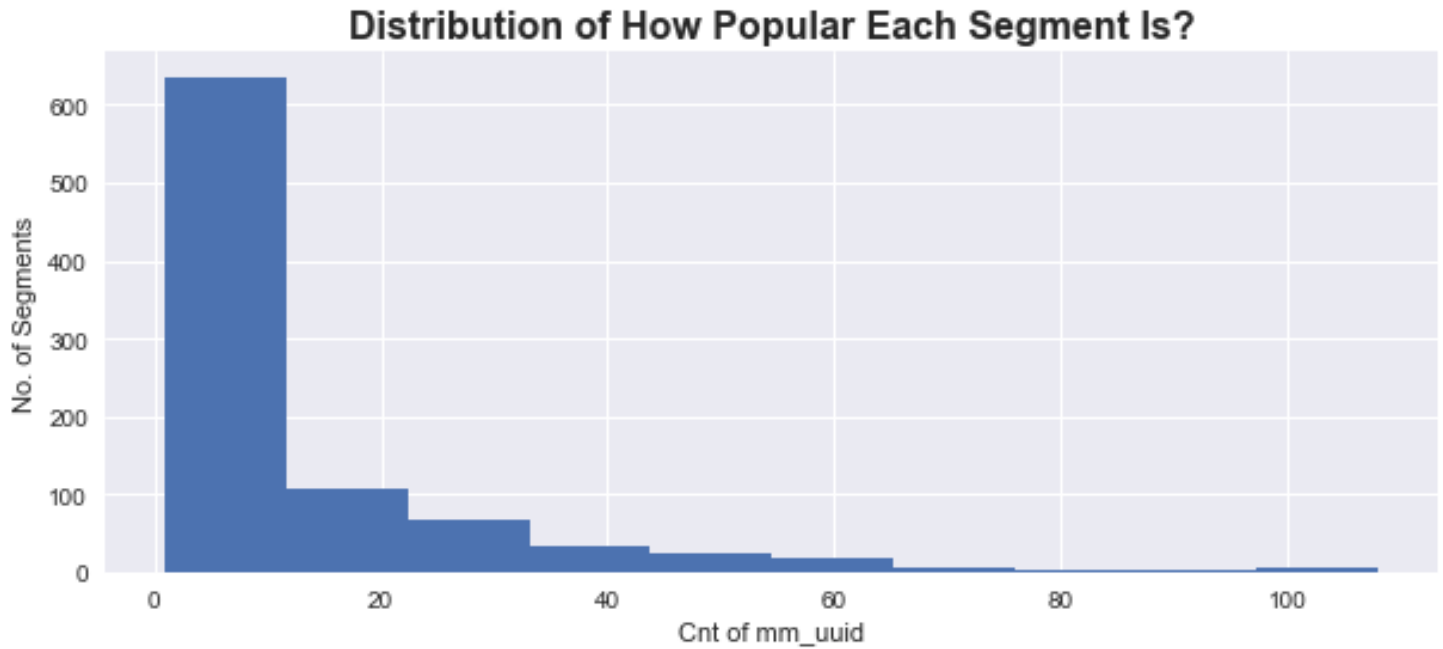


HOW WELL CAN WE SEGMENT USERS USING ONLINE ATTRITBUTES?

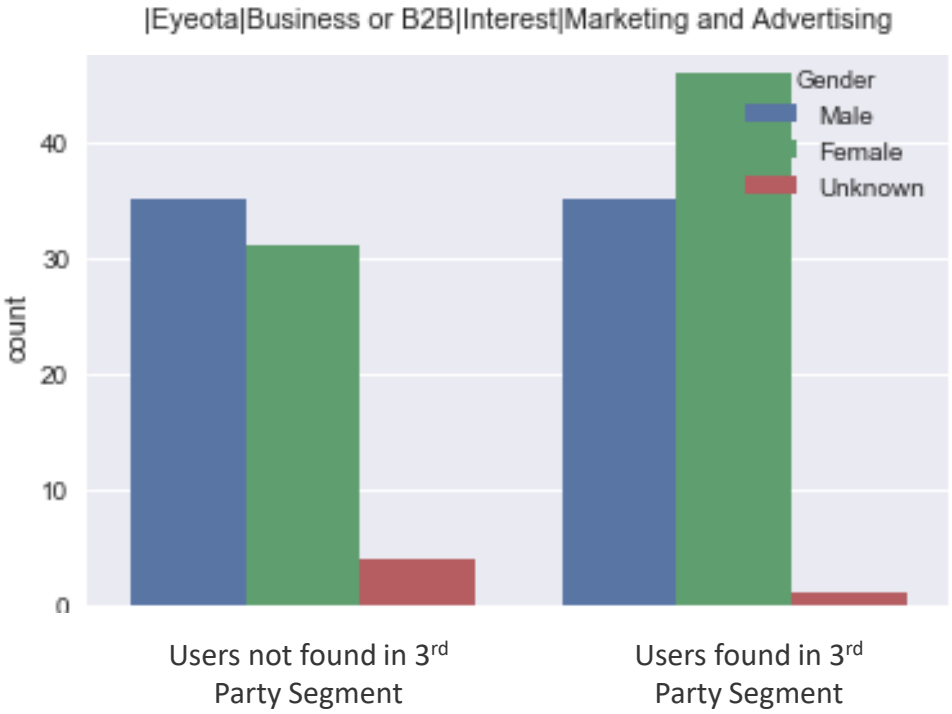
ANALYZED 148 SURVEY USERS (F: 77 ; M: 70 ; ?: 1)



899 SEGMENTS PROVIDED BY 3rd PARTY DATA COMPANIES



MODEL FEATURES



Example of a Model Feature: Users profiled in Marketing & Advertising by 3rd Party Audiences are more likely to be Female.

CORRELATION TO GENDER

	Segment	Corr	Corr_Abs
899	Gender_1_0	1.000000	1.000000
777	|Eyeota|Interest|Food Enthusiasts|Cocktails and Drinks	0.286143	0.286143
892	|Eyeota|Seasonal|Sport Events|Football Matches|FIFA World Cup 2018	-0.262948	0.262948
805	|Eyeota|Interest|Sports|Football	-0.262948	0.262948
531	|Eyeota|Branded Data|Global excluding US and EMEA ShareThis|Food and Drink|Beverages|Coffee and Tea	0.259608	0.259608
781	|Eyeota|Interest|Food Enthusiasts|Vegetarians and Vegans	0.249004	0.249004
711	|Eyeota|Intent|Shopping|CPG / FMCG|Grocery	0.247273	0.247273
857	|Eyeota|Regional Taxonomies|Southeast Asia (SEA)|Interest|Sports|Football	-0.246512	0.246512
778	|Eyeota|Interest|Food Enthusiasts|Cooking	0.240786	0.240786
710	|Eyeota|Intent|Shopping|CPG / FMCG	0.223172	0.223172

BUILDING A MODEL

ANALYZED 148 SURVEY USERS

Survey Data

	aac_uuid	ccs_uid	Gender
0	e09d5775-1aa2-4f00-af1b-3b0383b6a6e7	SGP16200003077	Female
1	bfa45769-3bcd-4000-96c8-e32efea73c5c	SGP16200003092	Male
2	ef5b573b-e9b6-4400-a9ab-ec12a0da6d25	SGP16200003071	Male
3	e15c55b4-98f3-4600-866d-496c962744bb	SGP16200003046	Female
4	7a175753-c3b9-4d00-a599-059eb41a860f	SGP16200003065	Female

3rd Party Data

	mm_uuid	provider	segment id	full path	date
17228	ff7756d5-73d8-4e00-a738-ccdfbed7e3be	ey	391	|Eyeota|Interest|Entertainment|Games and Toys	20/5/2017
17229	ff7756d5-73d8-4e00-a738-ccdfbed7e3be	ey	21949	|Eyeota|Interest|Entertainment|Music	20/5/2017
17230	ff7756d5-73d8-4e00-a738-ccdfbed7e3be	ey	459	|Eyeota|Interest|Sports|Football	20/5/2017
17231	ff7756d5-73d8-4e00-a738-ccdfbed7e3be	ey	21738	|Eyeota|Regional Taxonomies|Southeast Asia (SE...	20/5/2017
17232	ff7756d5-73d8-4e00-a738-ccdfbed7e3be	ey	21946	|Eyeota|Interest|Culture and Arts	20/5/2017

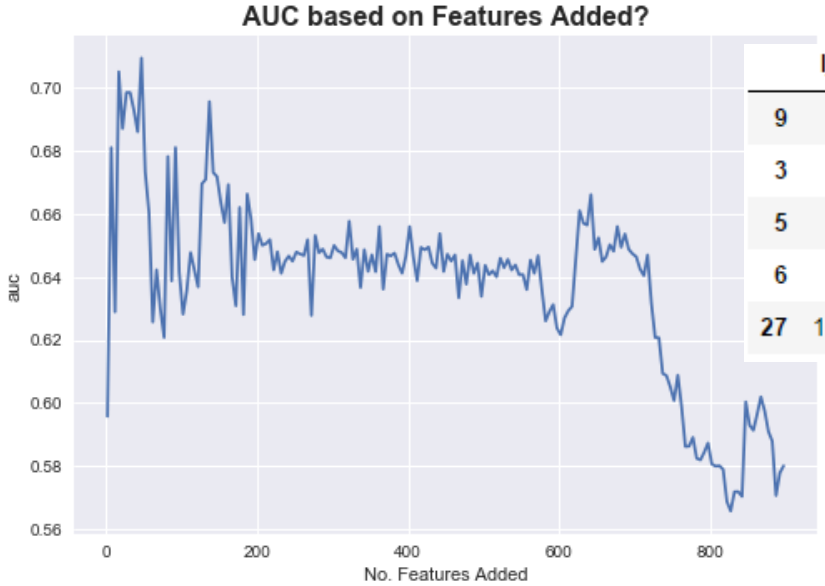
MODEL FEATURES:

- 899 Audience Segments
- Most popular Segments:

|Eyeota|Business or B2B	108
|Eyeota|Branded Data|Global Bombora|B2B|Professional Groups|Business Professional	102
|Eyeota|Interest|Tech Enthusiasts	101
|Eyeota|Business or B2B|Professions|Business Professionals	100
|Eyeota|Regional Taxonomies|Southeast Asia (SEA)|Interest|Tech Enthusiasts	97
|Eyeota|Business or B2B|Interest|Marketing and Advertising	81
|Eyeota|Interest|Entertainment	79
|Eyeota|Regional Taxonomies|Southeast Asia (SEA)|Interest|Arts and Entertainment	77
|Eyeota|Business or B2B|Interest|IT and Technology	74
|Eyeota|Branded Data|Global Bombora|B2B|Install Data|Web-Oriented Architecture|Web and Portal Technology	73
|Eyeota|Demographic|Employment Industry|HR and Recruitment	72
|Eyeota|Business or B2B|Interest|HR and Recruitment	69
|Eyeota|Branded Data|Global Bombora|B2B|Professional Groups|IT Professional	67
|Eyeota|Branded Data|Global Bombora|B2B|B2B Predictive Signals|Technology	66
|Eyeota|Demographic|Employment Industry|IT	65

MODEL 1: LOGISTIC REGRESSION

- Using a ranked list of features from the correlation between Gender & each segment, iterate through logistic model.



	l_n	l_auc
9	47	0.709437
3	17	0.705065
5	27	0.698467
6	32	0.698467
27	137	0.695588

Segment	Corr	Corr_Abs
Gender_1_0	1.000000	1.000000
|Eyeota|Interest|Food Enthusiasts|Cocktails an...	0.286143	0.286143
|Eyeota|Seasonal|Sport Events|Football Matches...	-0.262948	0.262948
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|Eyeota|Interest|Food Enthusiasts|Cooking	0.240786	0.240786
|Eyeota|Intent|Shopping|CPG / FMCG	0.223172	0.223172

MODEL 2: RANDOM FOREST

- Ranking of 899 features
- Top Features:

	ntrees	depth	auc
56	121	3	0.639556
55	121	2	0.638543
37	81	2	0.635630
64	141	2	0.634293
65	141	3	0.631404

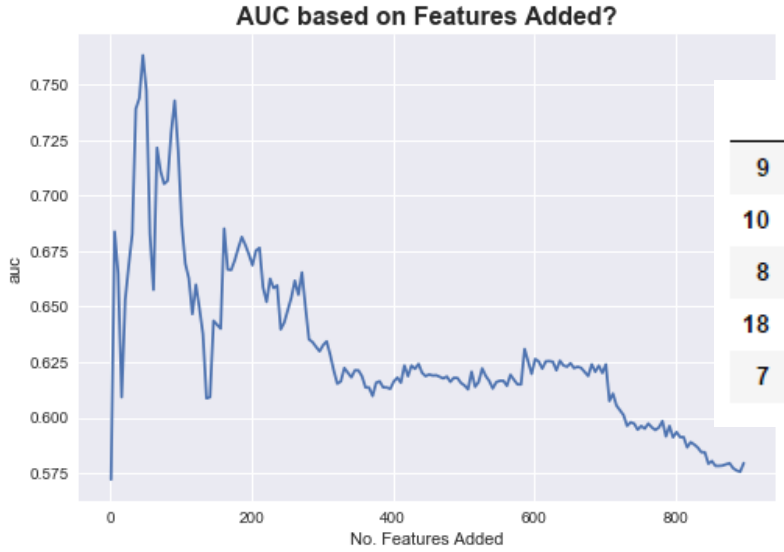
```
model = RandomForestClassifier(n_estimators = 121, max_depth=3, random_state=50)
X = data[data.columns[3:902]]
y = data['Gender_1_0']
model.fit(X, y)
scores = cross_val_score(model, X, y, scoring='roc_auc')
print('CV AUC {}, Average AUC {}'.format(scores, scores.mean()))
```

```
CV AUC [ 0.53525641  0.67558528  0.70782609], Average AUC 0.6395559271646228
```

	Features	Importance Score
805	|Eyeota|Interest|Sports|Football	0.029144
898	segment_cnt	0.020877
777	|Eyeota|Interest|Food Enthusiasts|Cocktails an...	0.019256
781	|Eyeota|Interest|Food Enthusiasts|Vegetarians ...	0.015991
857	|Eyeota|Regional Taxonomies|Southeast Asia (SE...	0.015597

MODEL 3: LOGISTIC REGRESSION

- Using a ranked list of features from the decision tree feature importance derived in Model 2, iterate through logistic model.



	l_n	l_auc
9	46	0.763189
10	51	0.747230
8	41	0.743830
18	91	0.742703
7	36	0.738993