An Analysis of Affordable and Sustainable Housing

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Why is housing important?

- Physiological need (Maslow's hierarchy)

- Community and belonging

- Family
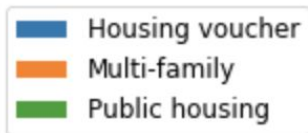
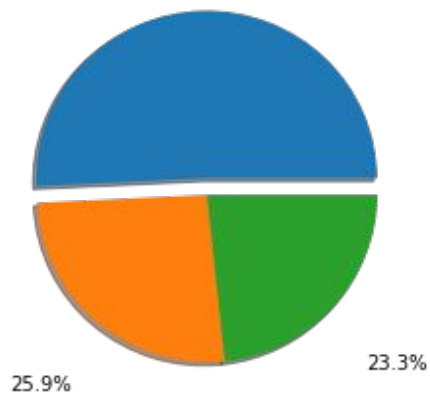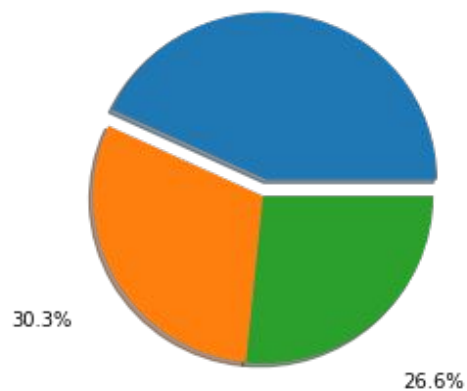- Opportunities for education and jobs

Exploratory Analysis

4.6 million
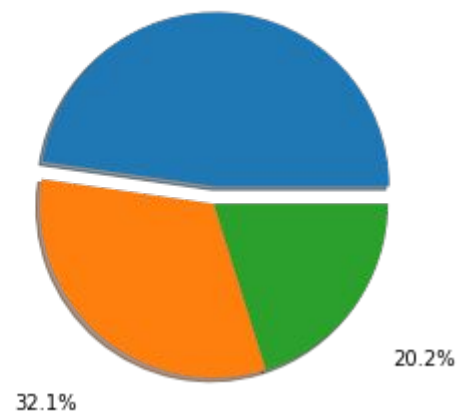
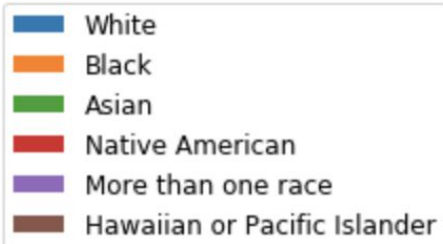Number of households that HUD provides rental subsidies to annually

Breakdown by Program - 2009

Breakdown by Program - 2014

Breakdown by Program - 2018
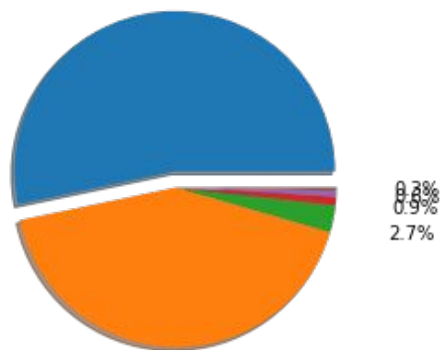
Breakdown by Race - 2009
- White: 53.3%
- Black: 42.2%
- Asian: 2.7%
- Native American: 0.9%
- More than one race: 0.8%
- Hawaiian or Pacific Islander: 0.2%

Breakdown by Race - 2014
- White: 50.8%
- Black: 44.5%
- Asian: 2.7%
- Native American: 0.9%
- More than one race: 0.9%
- Hawaiian or Pacific Islander: 0.4%

Breakdown by Race - 2018
- White: 51.8%
- Black: 42.4%
- Asian: 3.1%
- Native American: 1.2%
- More than one race: 0.9%
- Hawaiian or Pacific Islander: 0.5%

Legend:
- White
- Black
- Asian
- Native American
- More than one race
- Hawaiian or Pacific Islander
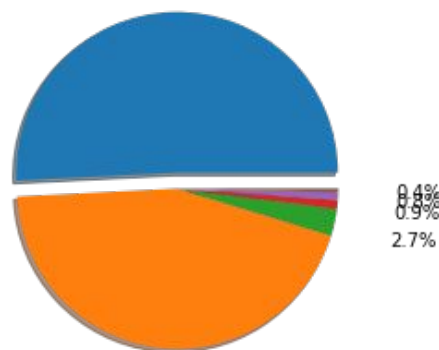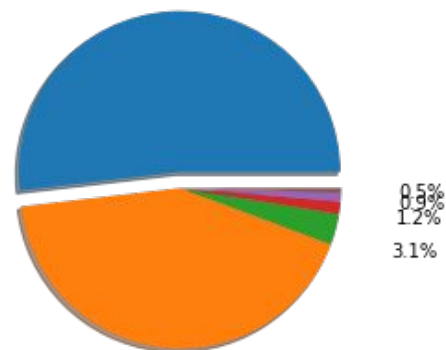
Trends

	Minority	Poverty
2009	**45.4 %**	**18.9 %**
2014	**53.5 %**	**15.2 %**
2018	**53.6 %**	**24.0 %**

Models

Logistic Regression

Goals

- Indicate significant predictors of the different program types
- Classify households into program type based on their characteristics

Logistic Regression

- Significant predictors
  - ◇ Elderly head of household, race of head household

- Program-specific predictors
  - ◇ Gender (housing choice voucher)
  - ◇ City type, Hispanic percentage (multi-family)

Logistic Regression

- Accuracy: 53.9%
- Sensitivity: 14.7%

```
              y_pred
y_true      1      2      3
    1     368   1401    737
    2     222   4771   1212
    3     236   1949   1829
```

Classification Tree

- Accuracy: 57.6%
- Sensitivity: 22.5%

```
                  y_pred
y_true       1       2       3
      1     564   1254    688
      2     314   4685   1206
      3     252   1681   2081
```

Conclusions

Inferences and Conclusions

- Public housing decreasing, multi-family (private) housing increasing

- Poverty levels in HUD areas increasing

- Demographics of head of household most significant for predicting program type
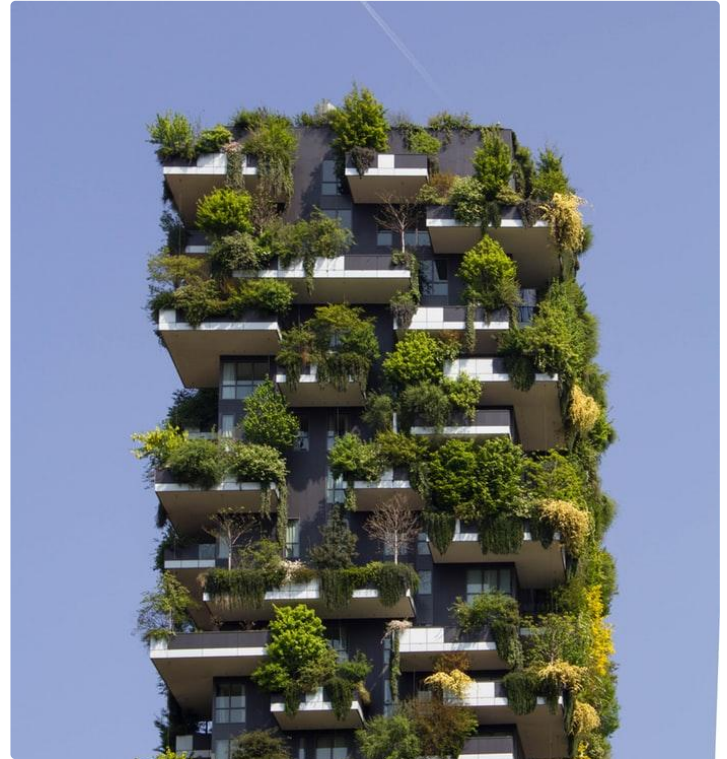
Next Steps

Plan for Action

- Further understand groups at a more individual level

- Develop more accurate classification methods

- Anticipate needs for each program type to better cater to individual households

SUSTAINABILITY

Sustainability Pillars

1. Environmental
   a. Higher quality housing
   b. Living conditions
2. Economic
   a. Access to jobs
   b. Disposable income to stimulate local economy
3. Social
   a. Build communities
   b. Better school districts
   c. Health

THANKS!

Any questions?