Capstone Project: AAC Adoption

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Background

The data used for this capstone was compiled by the AAC (Austin Animal Center Shelter). They compiled intakes and outtakes of animals from Oct 2013 through present. The goal was to identify the top animals to market in advertisements to boost adoptions. Animal types, breeds, and ages were evaluated, and I specifically reviewed the cases that led to adoptions and euthanizations.

Sections

Steps taken to determine if there were significant breeds/ ages that led to more adoptions/ euthanizations

➔ **Data wrangling**
   Cleaned AAC data and began initial exploration
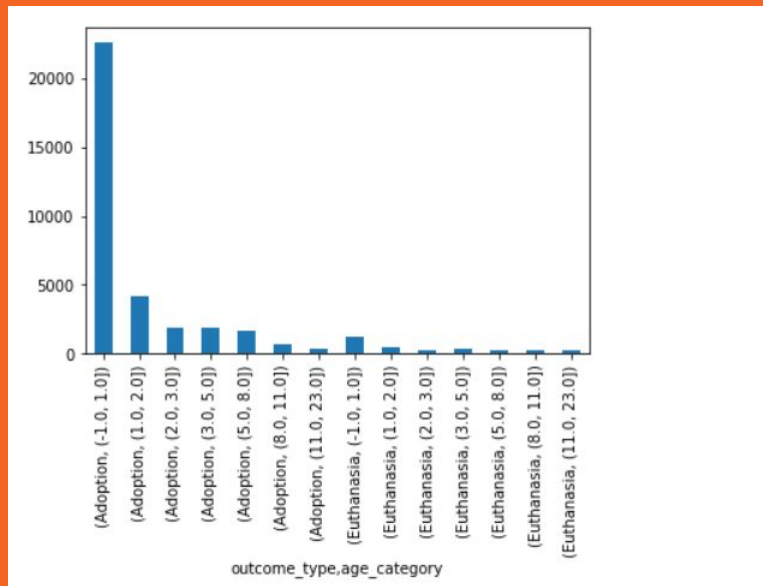
➔ **EDA**
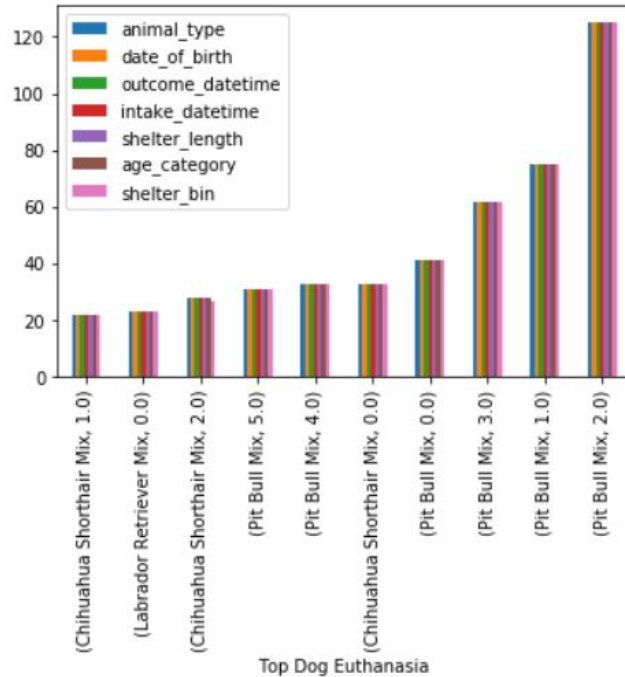   Explored data through story-telling and inferential statistics

➔ **TBD**
   Machine learning section?

Data Wrangling:

- **Created datatime objects to calculate shelter length and age of outcome**
- **Used timedelta to put into sizeable chunks**
- **Initial EDA showed only outcome types of interest were adoption and euthanasia**
- **EDa also showed animals should be cats/ dogs**

EDA

Legend:
- animal_type
- date_of_birth
- outcome_datetime
- intake_datetime
- shelter_length
- age_category
- shelter_bin

Top Dog Euthanasia

- Noticed adoptions and euthanasia cases were led by younger animals
- Reviewed top breeds foradopted and euthanized - noticed DS mix dominated
- Decided to omit cats as the breeds are not as concrete and threw off data
- Once cats were removed, I reviewed the top breeds adopted and euthanized sorted by age of outcome

EDA

- Saw that the top breed adopted was Lab Retriever Mix (0-1 yr) and led by almost double
- Next top adopted breeds were Chihuahua Shorthair Mix (0-1yr) and Pit Bull Mix (1-2yr)
- Euthanasia cases were led by Pit Bull Mix (0-3yr) which was surprising
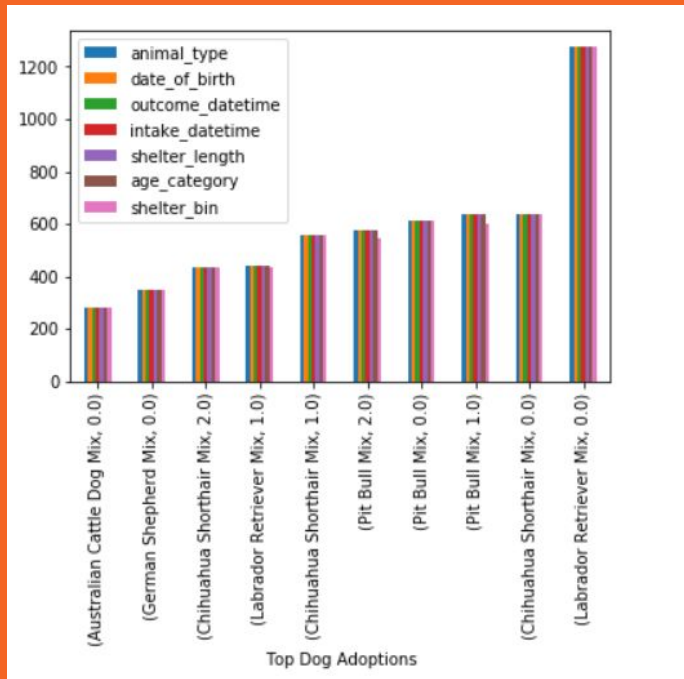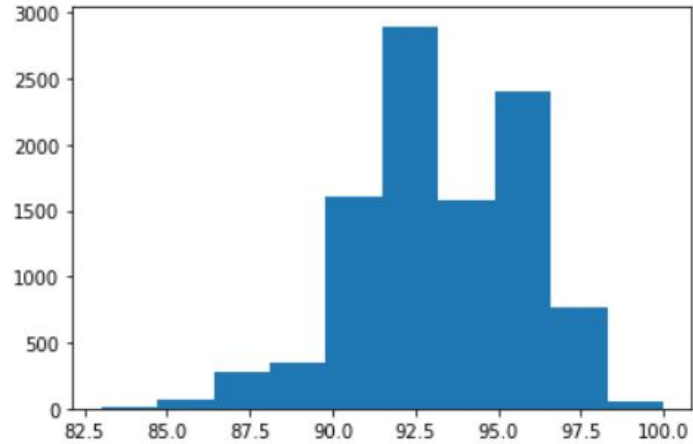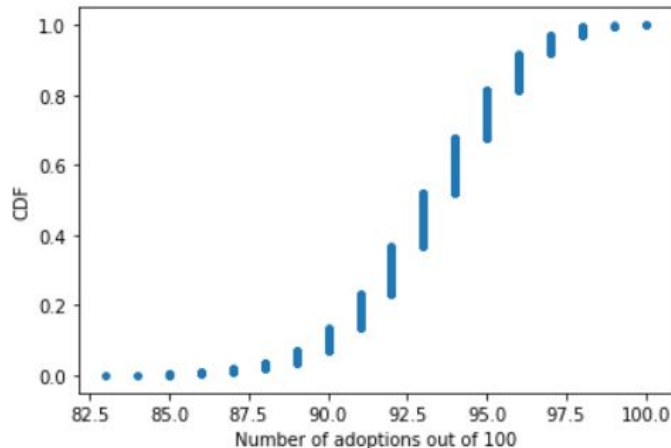
Adoptions vs Euthanasia

Wanted to check the probability of adoptions verse euthanasia cases - performed a binomial distribution through numpy.
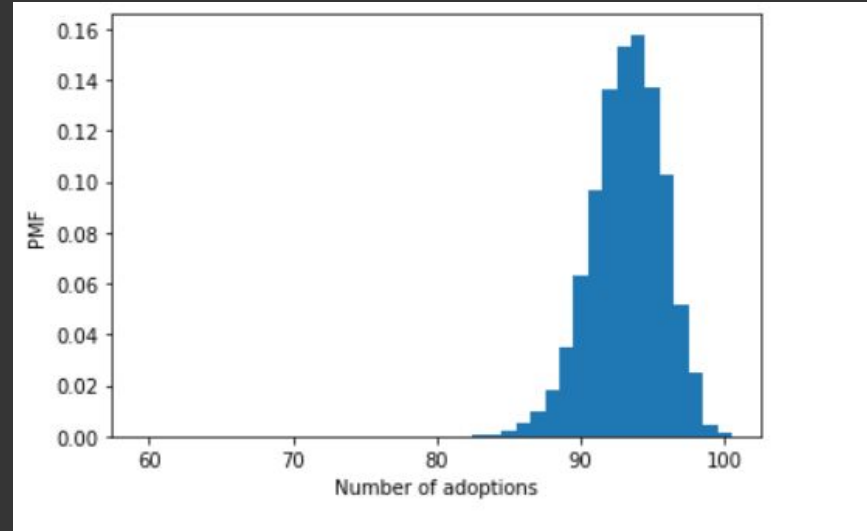
Saw that on average 93% animals were adopted and plotted as a histogram, ECDF, and PMF

Poisson Distribution

Performed a Poisson distribution of shelter adoptions and calculated mean and percent of data under 3 years

Saw that the mean shelter length was 3 years and 64% of adoptions occurred below 4 years

Poisson Distributions

Performed numerous Poisson distributions to run simulations to see what conclusions could be drawn

➜ **Age of adoptions**
Posson showed mean age of adoption was 1.8 and 73% were adopted under 3 years

➜ **Pit Bull Euthanized**
Poisson showed mean age of euthanized was 3 yrs and 64% were euthanized below 4yrs

➜ **Pit Bull Adopted**
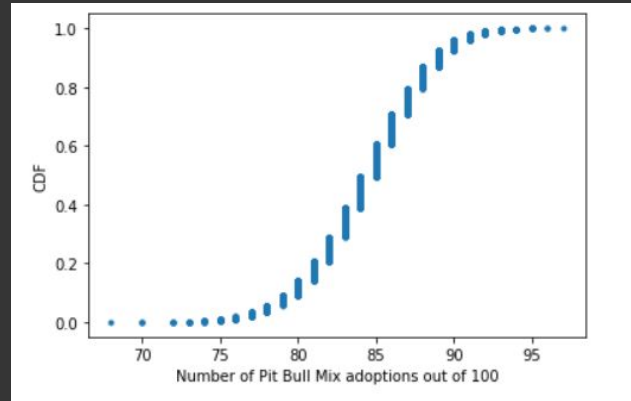Poisson showed mean age adopted was 1.7 yrs and 76% were adopted below 3

Although Pit Bulls had the highest number of euthanasia cases, 84% of all Pits were adopted

Pit Bull cont.

Performed binomial distribution on total pit bull adoptions

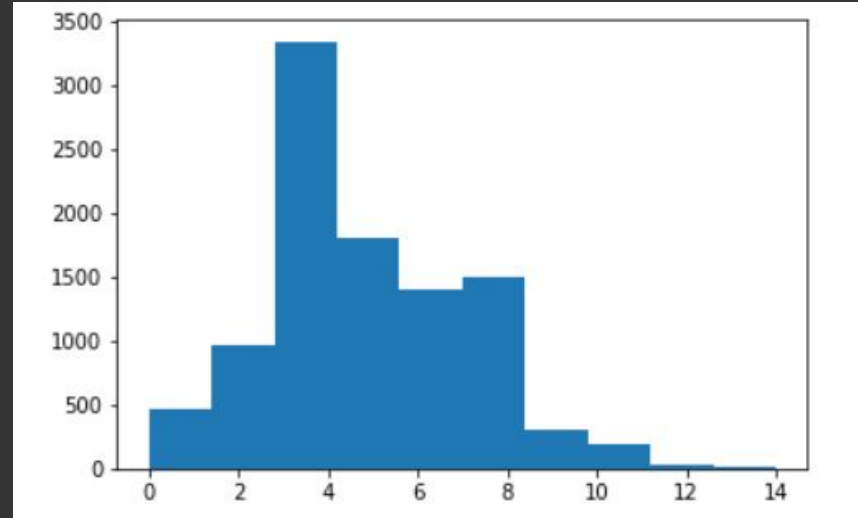**ECDF showed percentage of adoptions was between 75% and 90%**

Lab Retriever

Performed Poisson distributions of Lab adoption data

- Mean age adopted was 1.4 and 84% were adopted below 3yrs

Performed binomial distribution of Lab euthanized data

- 5% of lab mixes out of total labs were euthanized

Labs adopted

Lastly performed a binomial distribution of lab mixes adopted out of total adopted cases.

Saw that lab retriever mixes account for 12% of total adopts and in simulation this ran from 5 - 20 %

Although this seemed low considering the number of adoptions was double that of the runner-up breed, I believe this may be due to people not truly specifying Labrador Retriever Mix on the shelter forms. Many people maybe just put Labrador or Retriever, which would skew the data