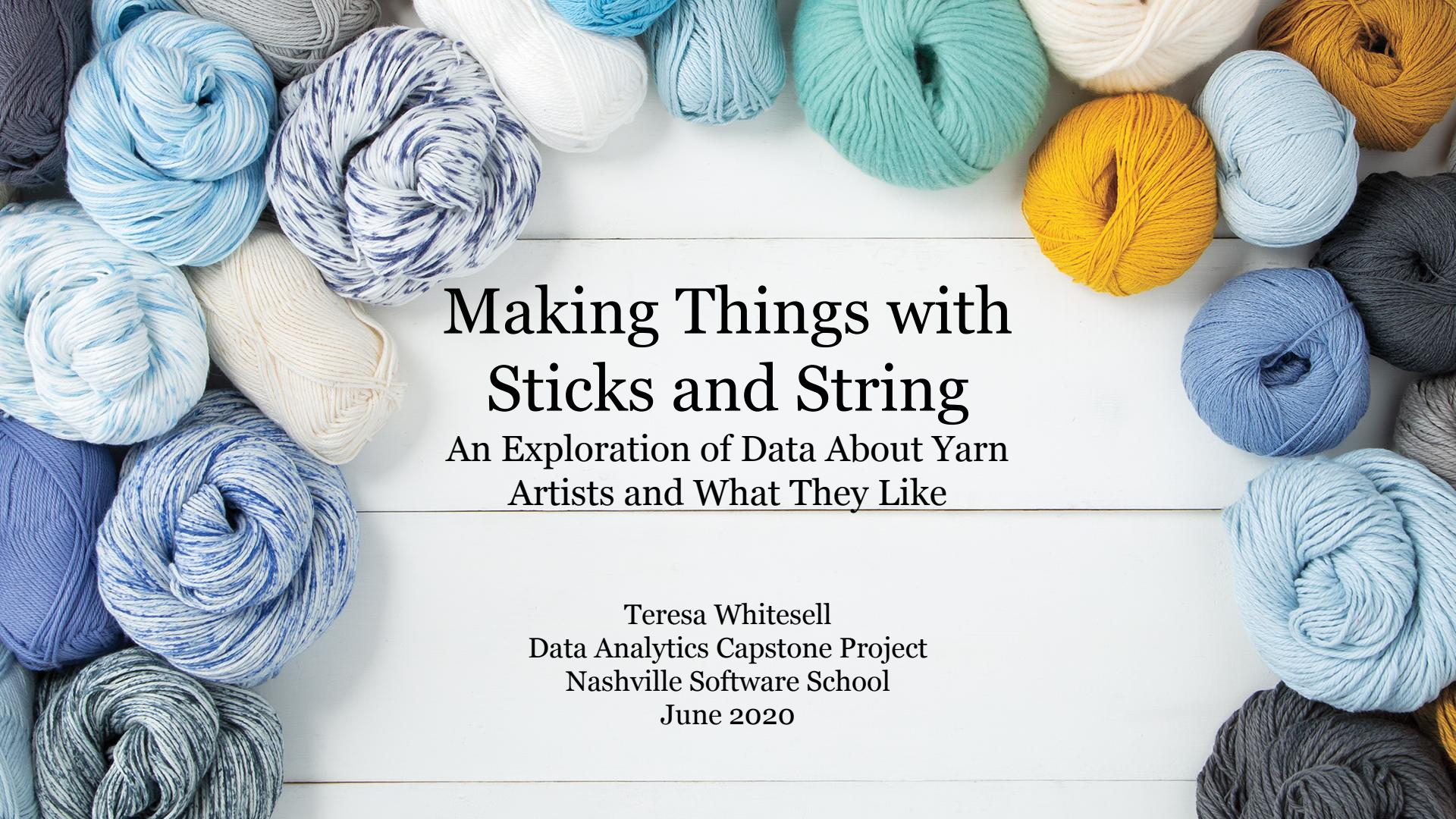

Making Things with Sticks and String

An Exploration of Data About Yarn Artists and What They Like

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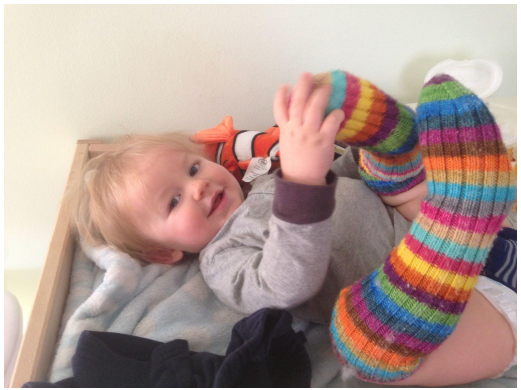
Data Analytics Capstone Project
Nashville Software School
June 2020

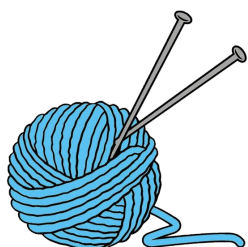
Motivation - Why I care about this topic

- I enjoy knitting and wanted to dig into the data available.
- Yarn crafting is a way to connect different parts of my life together - family, travel, creating



Motivation - Why you should care about this topic

- Millions of people in the US of all ages knit or crochet
  - 28.8 million in 2016
- Most money spent by knitters is spent at local shops, benefiting small businesses and local economies throughout the country
  - Total spending in 2016 $2.79 billion
- Repetitive non-verbal tasks like knitting and crochet help people pay attention in meetings by giving the rest of the brain something to do
- Knitting and crochet have beneficial health effects



Information source: AFCI report “2016 Creative Products Size of the Industry Study”, The Knitting Lady is Paying Attention, Knit One Purl One: The Health Benefits of Knitting

What are Knitting and Crochet?

- Knitting is the process of creating fabric from yarn using two straight needles; the fabric can be flat or shaped
- Crochet is the process of creating fabric from yarn using a hooked needle
- A written pattern with detailed instructions is usually used in both crafts

What are Characteristics of a Knitting Enthusiast?

- 86% use Ravelry
- Average yearly spending $801 (63% on yarn)
- Average time spent per week 10 hours
- Average completed projects per year 24
- 42% also crochet
- Spending breakdown:
  - 48% independent yarn shops
  - 24% online yarn stores
  - 14% craft chains
  - Remainder purchased at events, direct from the yarn producer, other sources

Information source: TNNA report “The State of Specialty NeedleArts 2013”,
Information source: TNNA report “Knitter Survey Results 2013”

What are Characteristics of a Crochet Enthusiast?

- 69% use Ravelry
- Average yearly spending $570 (66% on yarn)
- Average time spent per week 10 hours
- Average completed projects per year 39
- 49% also knit
- Spending breakdown:
  - 21% independent yarn shops
  - 21% online yarn stores
  - 40% craft chains
  - 7% from mass merchandisers
  - Remainder purchased at events or other sources

Information source: TNNA report “The State of Specialty NeedleArts 2013”

What is Ravelry?

- Website for yarn crafters and fiber artists
- Provides a way for users to keep track of projects, purchased yarn, patterns
- Extensive database of patterns, yarns, yarn stores, designers
  - 9 million registered users
  - Almost 1 million patterns
  - 185,000 yarns
  - 21.5 million projects

ravelry

Information source: www.ravelry.com

Questions

- Where is there a high concentration of yarn shops?
- What are characteristics that contribute to the popularity of a pattern?
- What are characteristics that contribute to the popularity of a yarn?

Approach

- Use the Ravelry API to scrape data
  - Pattern listings and pattern details
  - Yarn listings and yarn details
  - Yarn shop listings and yarn shop details
- Clean data
  - Merge paired dataframes
  - Drop unneeded columns
  - Unnest ‘dictionary’ columns to access information
- Exploratory data analysis
  - Understand the data
- Visualize important metrics

Challenges

- Using the Ravelry API to retrieve data
  - Not previously familiar with API methods
- Cleaning the Ravelry data
  - Unnesting faux-dictionary columns

Methodology

- Yarn shop listings
  - Create geometry to allow mapping
  - Merge with US county shapefile
  - Find yarn store “hot spots” - areas with a high number of yarn shops
  - Find locations with greatest potential for opening a new shop based on county population
- Pattern listings
  - Analyze for popularity by different metrics - craft, pattern category, yarn weight
- Yarn listings
  - Analyze for popularity by different metrics - yarn weight, washability

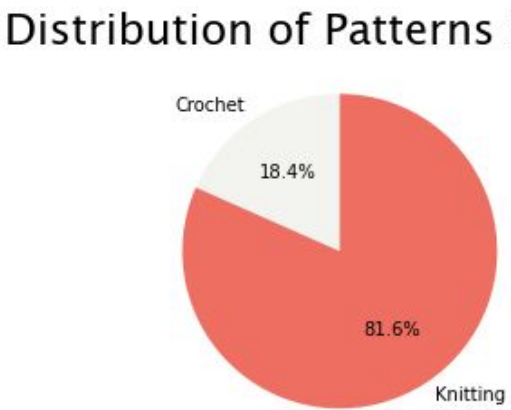
Independent/Local Yarn Shops in the US

- 2093 independently-owned shops in US
- Largest number of shops (by county) located in:
  - Los Angeles county
  - King county (Seattle)
  - Middlesex county (part of Boston metro area)

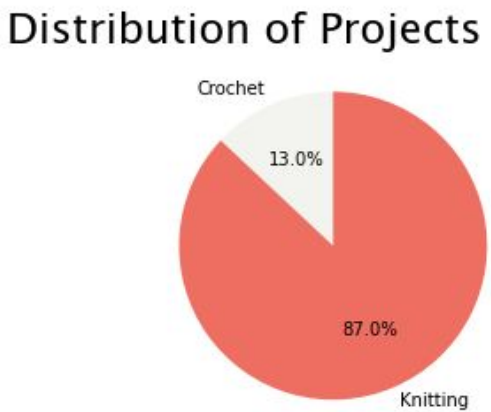
Best Locations for a New Shop

- Meet Anne: she'd like to open a yarn shop
- Where are the best locations based on population?
  - Calculated based on median county population per currently open shop
  - Los Angeles has 33 shops already, could support 151 additional shops (54 based on mean)
  - Top county with no current shops: Dallas county in Texas has a population of over 2.5 million, could support 48 shops based on the median population calculated, or 23 shops based on the mean

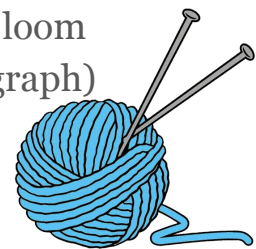
Analysis of Patterns - knitting vs crochet



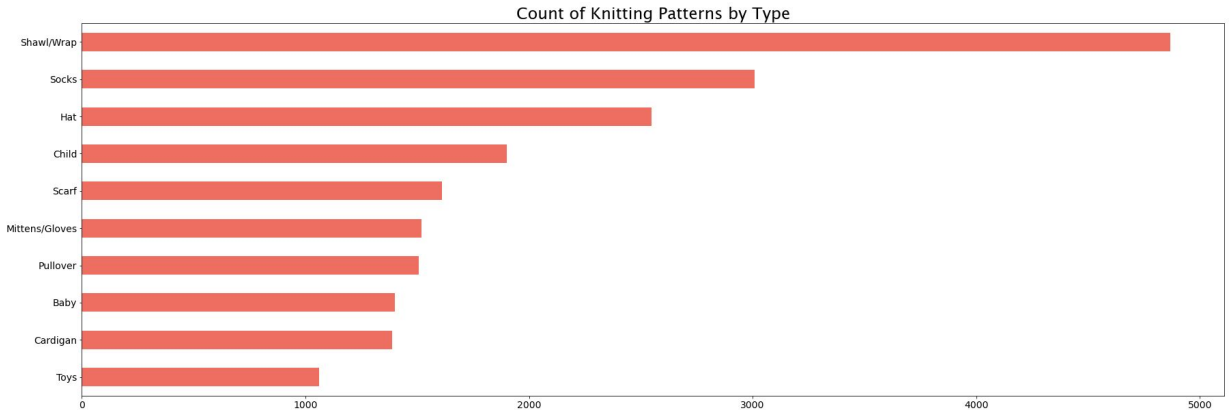
- Top 30,198 patterns in Ravelry database, ordered by most projects
- 24,635 knitting patterns, 5542 crochet
- 8 machine knitting, 13 loom knitting (omitted from graph)

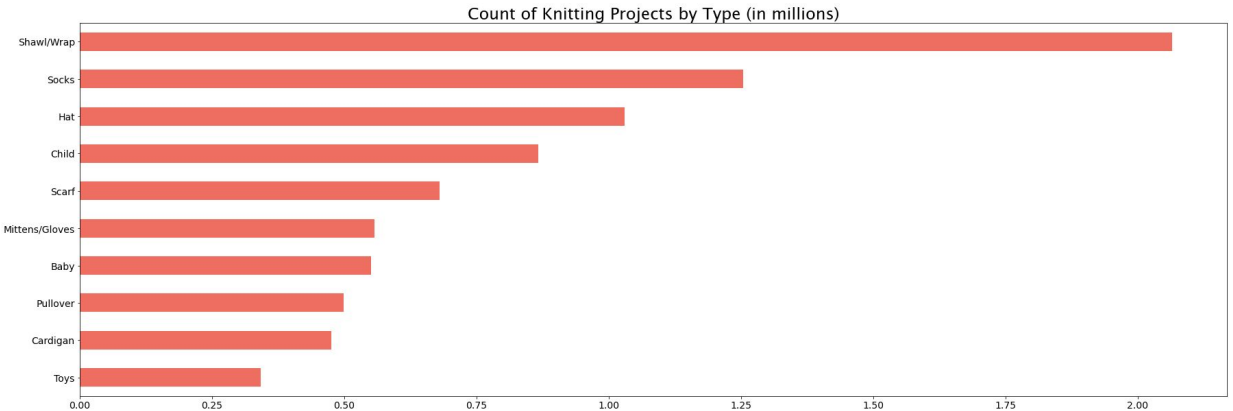


- 9,587,055 knitting projects
- 1,434,540 crochet projects
- 1652 machine knitting and 1940 loom knitting projects (omitted from graph)

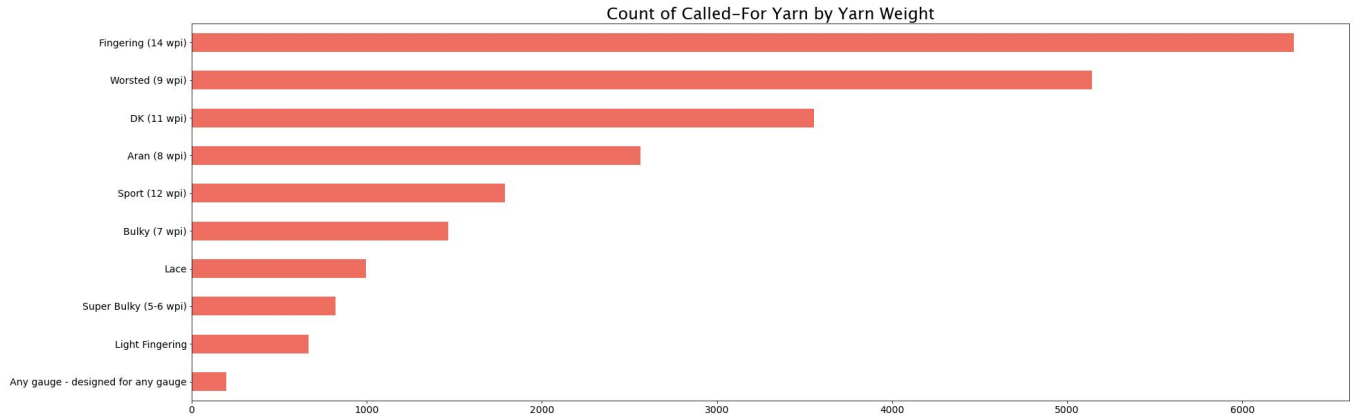


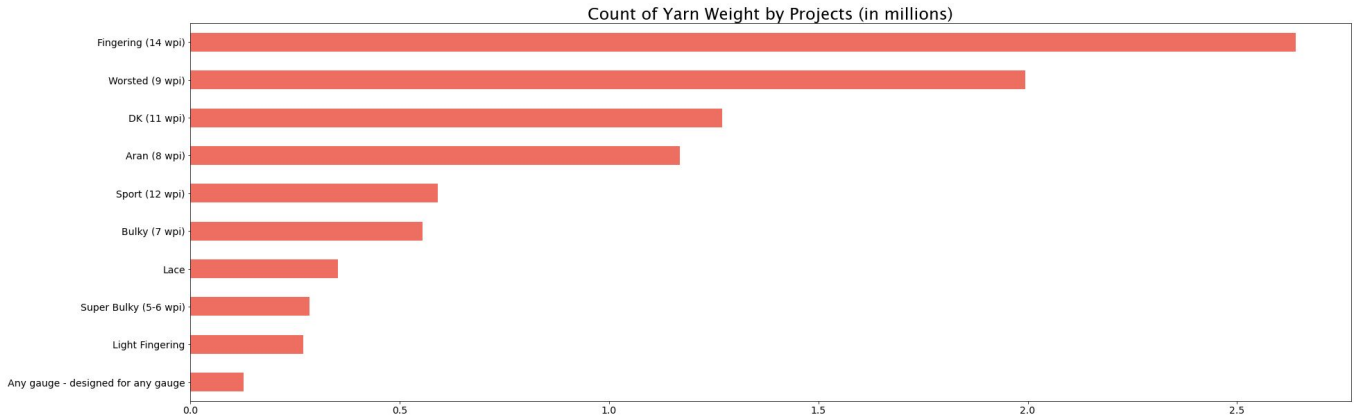
Patterns by Category



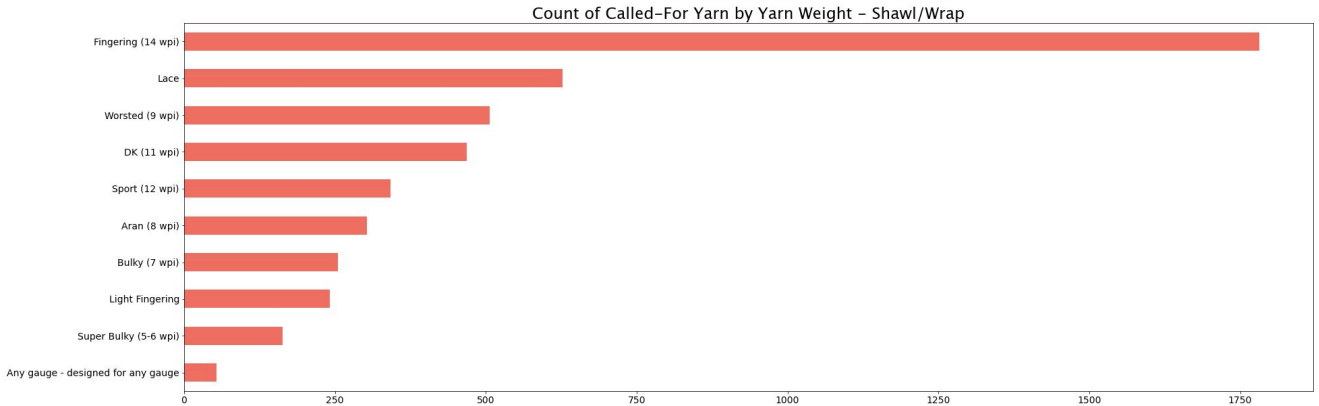


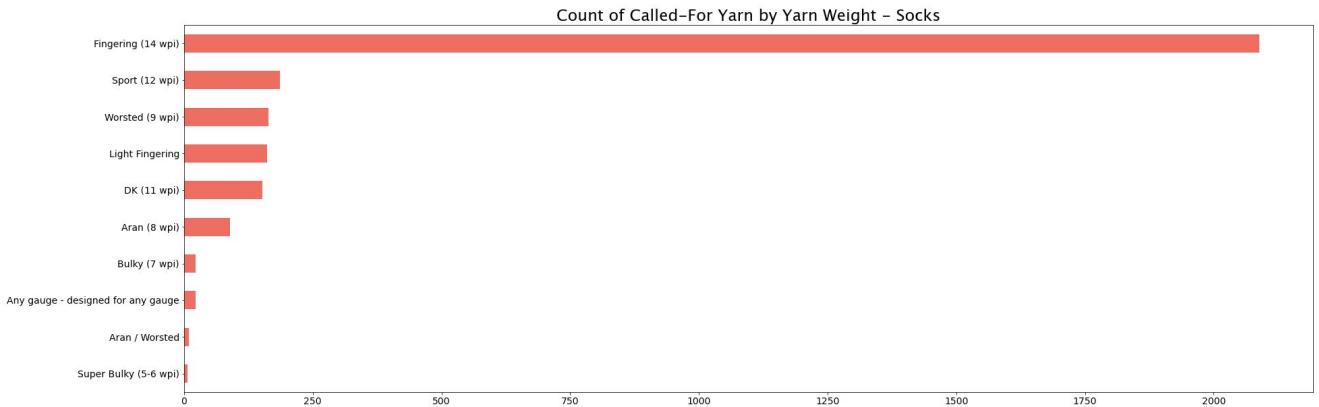
Patterns by Yarn Weight





Yarn Weights for Most Popular Pattern Categories





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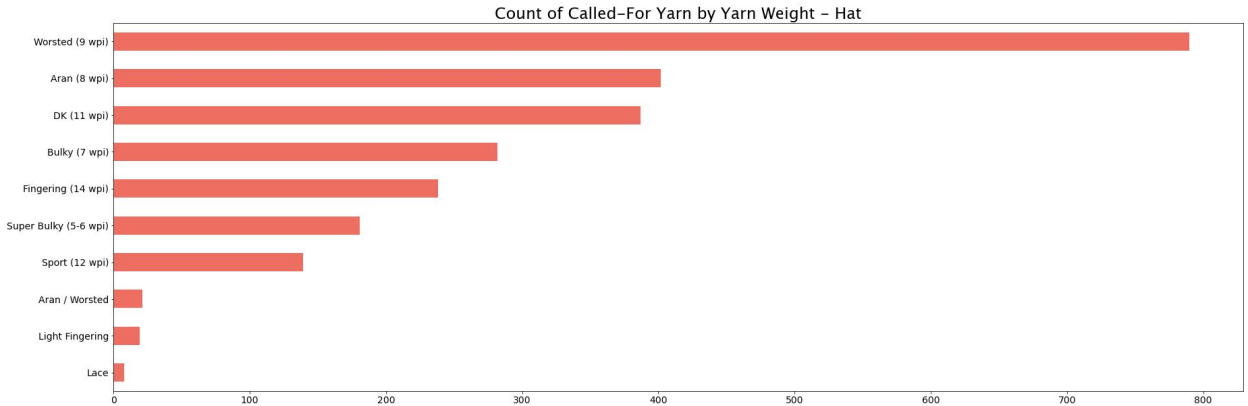
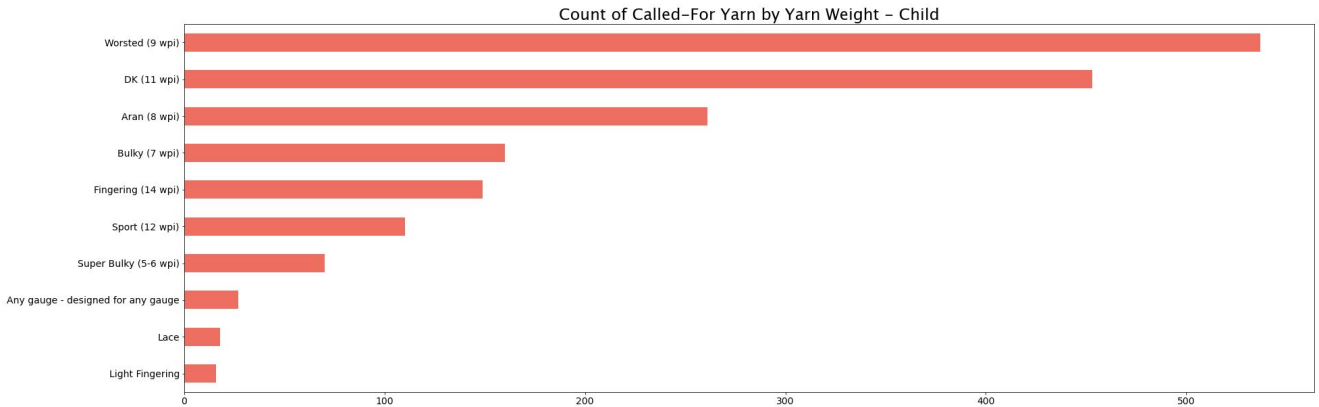
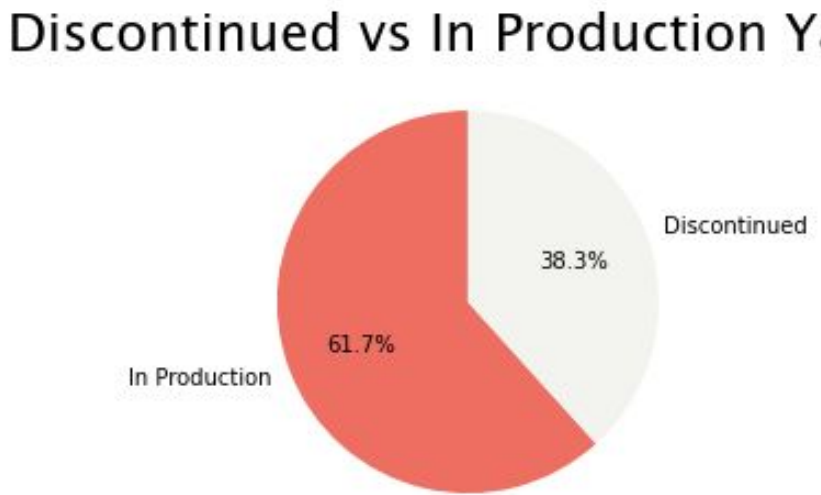




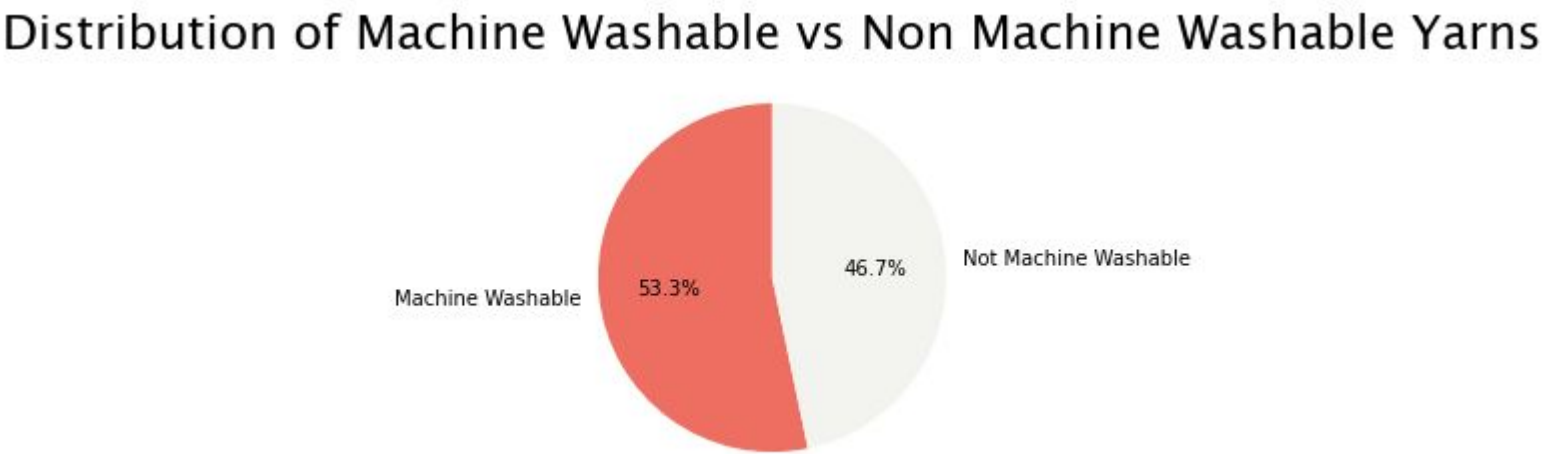
Most Used Yarns - In Production vs Discontinued

- Top 10,000 yarns in Ravelry database, ordered by most projects

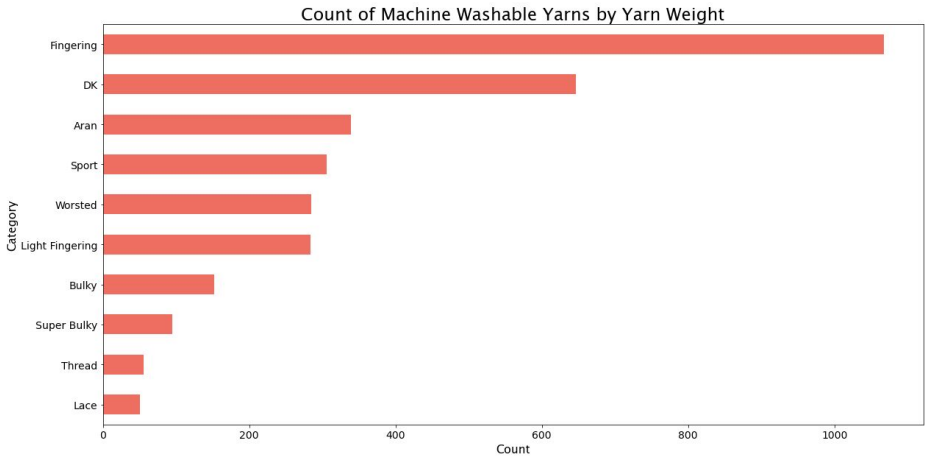


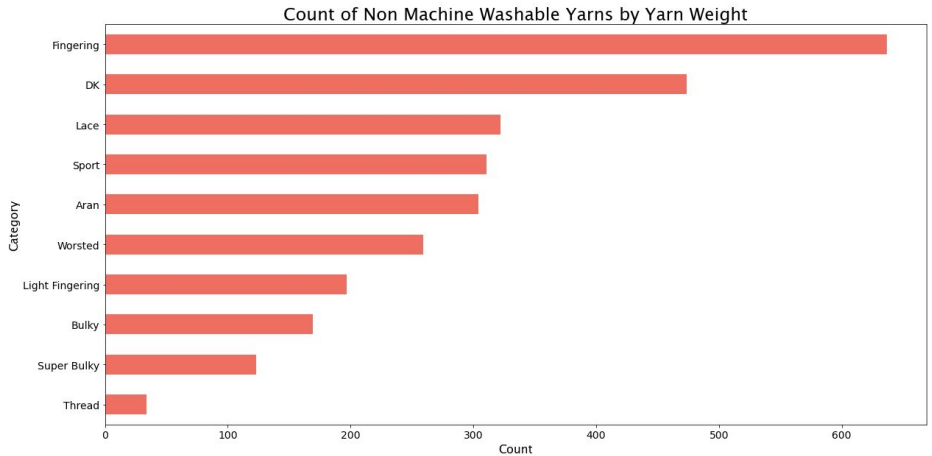
Machine Washable Yarns

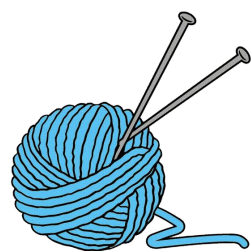
- Of the 6172 currently available yarns in the top 10,000



Machine Washable vs Non-Machine Washable Yarns By Weight







Summary

- There are approximately 2100 independent local yarn shops in the US, with the highest numbers found in three counties: Los Angeles, King, and Middlesex
- A lot of potential for new shops in Los Angeles, Dallas is the largest population center without a current yarn shop
- Based on pattern and project count, knitting is the most popular craft represented on Ravelry; the most popular category is shawl/wrap and the most often called-for yarn weight is fingering
- There is not a strong preference for machine washable yarn overall

Data Sources

- Ravelry (ravelry.com)
- US Census Bureau (census.gov)