

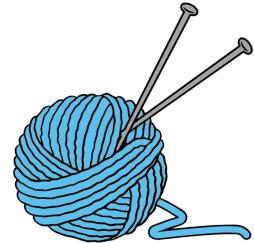
Making Things with Sticks and String

An Exploration of Data About Yarn
Artists and What They Like

Teresa Whitesell
Data Analytics Capstone Project
Nashville Software School
June 2020

Motivation - Why I care about this topic

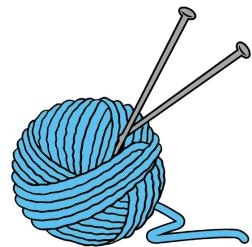
- I enjoy knitting and wanted to dig into the data available.
- Yarn crafting is a way to connect different parts of my life together - family, travel, creating



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



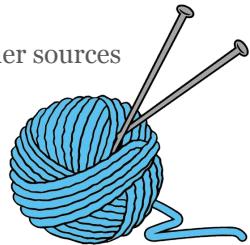
Knitting

- Knitting is the process of creating fabric from yarn using two straight needles
- 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”

Crochet

- Crochet is the process of creating fabric from yarn using a hooked needle
- 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



Data Questions

- Where is there a high concentration of yarn shops currently?
- What are good locations for potential new yarn shops to open?
- 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 obtain 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

The Story of the New Look

By Ida June 16, 2020

Hi everyone!

I've had this post saved as a draft for a long time, and have hesitated about sharing it, as I can't believe we finally have more or less been working on the new look since I started as Ravelry's product designer in January of 2019. When the team (Cassidy, Jess, Mary Heather, Sarah, Christina, and I) talked about it in the early stages, we discussed two big reasons for making the change:

1. After 12 years, Jess and Cassidy wanted to move away from pinks and the pale greens to a more modern, neutral, polished look and feel (I still keep the vintage style up on my phone). These colors didn't work well with our logo design, was difficult to reproduce in print, and many people didn't find it recognizable as a yarn ball. We all agreed that the site needed a fresh coat of paint.
2. Cassidy and I are creating a Ravelry design system, which will help us work on big new projects without having to reinvent the wheel every time. A design system is a defined set of web components and styles that can be combined in different ways, like building blocks, to create pages and features. Design systems allow for better consistency and accessibility, and encourage us to build new things quickly and easily. We also wanted to bring some principles from the knitting world from old look Ravelry for a variety of reasons, so we decided to rekin the hundreds



Challenges

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

Sections

[Top](#)
[Example code](#)
[Authenticating](#)
[OAuth Permissions](#)
[Status codes](#)
[Results objects](#)
[Sorting and paging](#)
[Methods](#)
[Result objects](#)
[CORS](#)
[ETags](#)
["Polling" for updates](#)
[Debugging](#)

API Methods

misc
color_families
current_user
yarn_weights

app
config/delete
config/get
config/set
data/delete
data/get
data/set

bundles
create
delete
list
show

Ravelry API Documentation

Last updated 2020-01-30

♥ Welcome!

Once you decide which type of credentials you need, create your App and keys by visiting <https://www.ravelry.com/pro/developer>. If you do not already have a free Pro account you'll be prompted to create one.

This documentation lists the API methods, inputs, and outputs but it doesn't describe how to put it all together. Please come visit the [Ravelry API](#) to ask questions and share your requests for improvements.

You can also ask me questions on Twitter by tweeting at @outcassed (me) or @ravelry

Example Code

- [Project notebook lister. \(Javascript\)](#) Shows how to use a read-only API key to get data from Ravelry. <https://glitch.com/~readonly-ravelry-api-example>
- [Log in with Ravelry \(Javascript & Node.js\)](#) Demonstration of using an OAuth 2 API key to access Ravelry as an authorized user. <https://glitch.com/~ravelry-test-oauth>

Accessing Ravelry with HTTP Basic Auth: read only access

If you only need to use read-only API methods, read-only Basic Auth is the simplest way to get started.

When you use your read-only credentials, you will only be able to call API methods that are not marked as "authenticated" in the documentation.

Use HTTP Basic Authentication with your HTTP client and supply the username and password taken from your app's credentials. SSL is required.

Example:

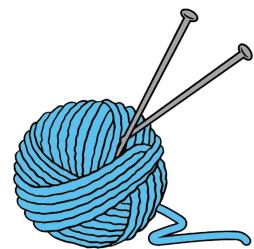
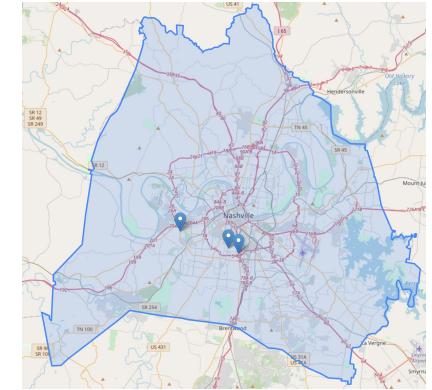
```
curl -u basic_auth_username:basic_auth_password  
https://api.ravelry.com/current_user.json
```

Authenticating via HTTP Basic Auth: personal account access



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



Meet Annie

- Knitter/crocheter
- Would like to open a yarn shop
- Willing to move to increase chance of success
- Wants to know what yarn weights and patterns are most popular to help with buying stock for her shop

—The Yarn Weight Family—

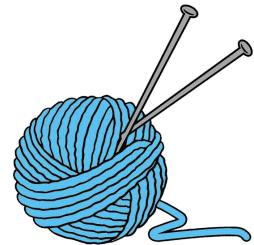


Source: Craft Yarn Council's www.YarnStandards.com



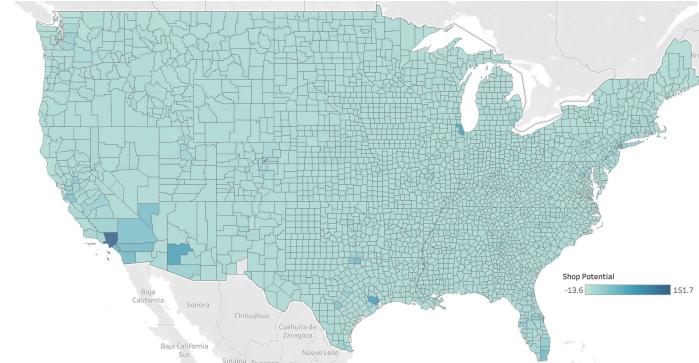
Independent/Local Yarn Shops in the US

- 2093 independently-owned shops in US ([map of US yarn shops](#))
- Largest number of shops (by county) located in:
 - Los Angeles county ([map of LA yarn shops](#))
 - King county (Seattle) ([map of Seattle/King county yarn shops](#))
 - Middlesex county (part of Boston metro area) ([map of Middlesex county yarn shops](#))



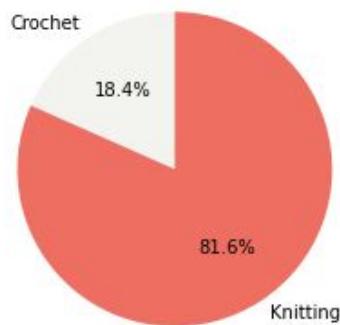
Best Locations for a New Shop

- Where are the best locations based on population?
 - Calculated based on median county population per currently open shop
 - Scores range from -13 to 151
 - Los Angeles has 33 shops already, has top score
 - Top county with no current shops: Dallas county in Texas has a population of over 2.5 million, and a score of 48
 - [Tableau Dashboard of Potential for New Yarn Shops](#)

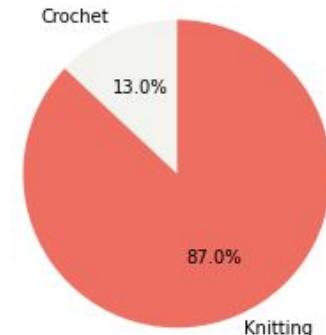


Analysis of Patterns - knitting vs crochet

Distribution of Patterns by Craft

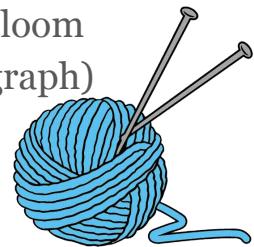


Distribution of Projects by Craft

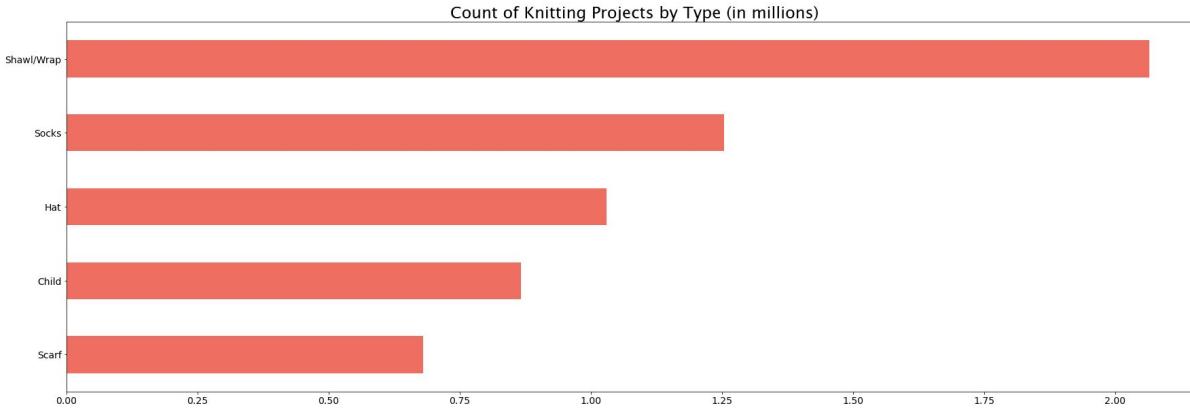
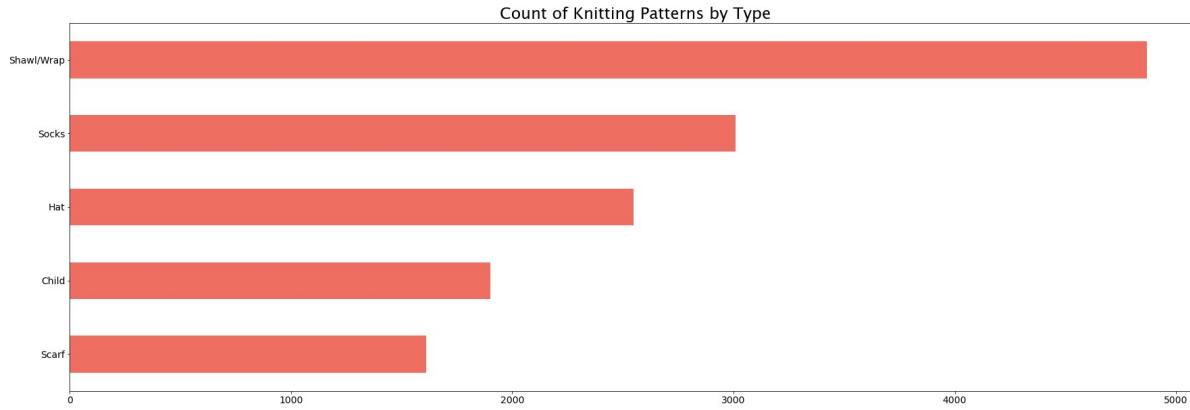


- Top 30,198 patterns in Ravelry database, ordered by most projects
- 24,635 knitting patterns, 5542 crochet
- 8 machine knitting, 13 loom knitting (omitted from graph)

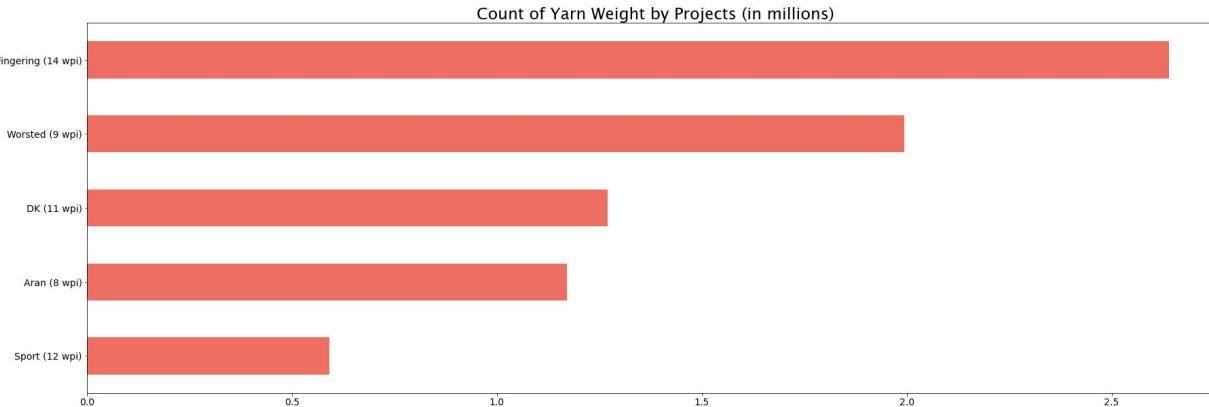
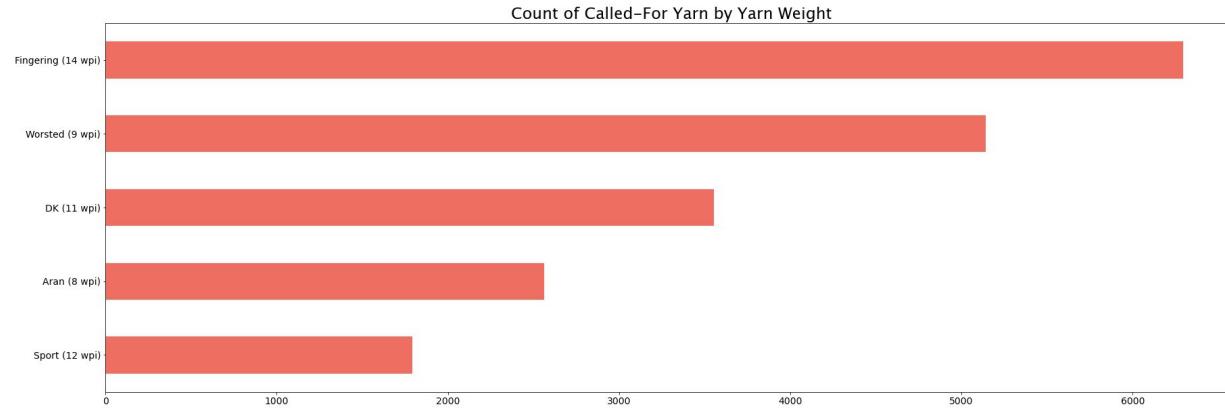
- 9,587,055 knitting projects
- 1,434,540 crochet projects
- 1652 machine knitting and 1940 loom knitting projects (omitted from graph)



Patterns by Category

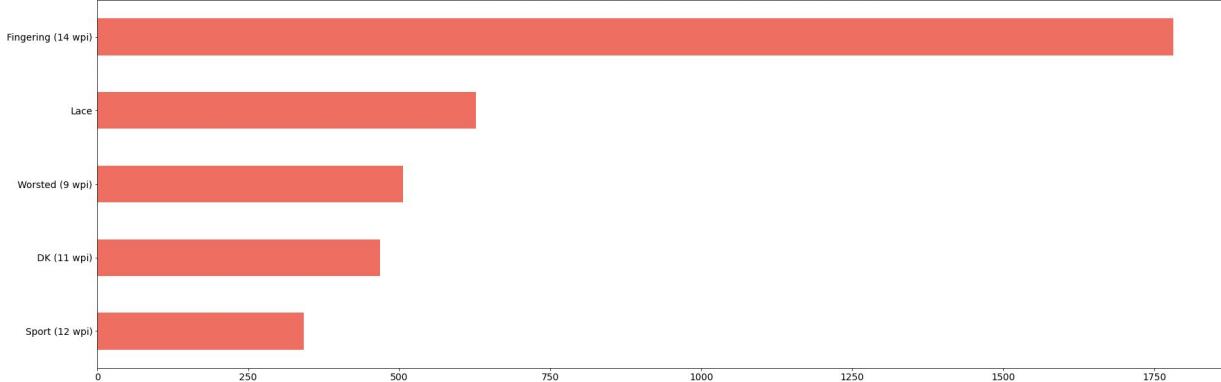


Patterns by Yarn Weight

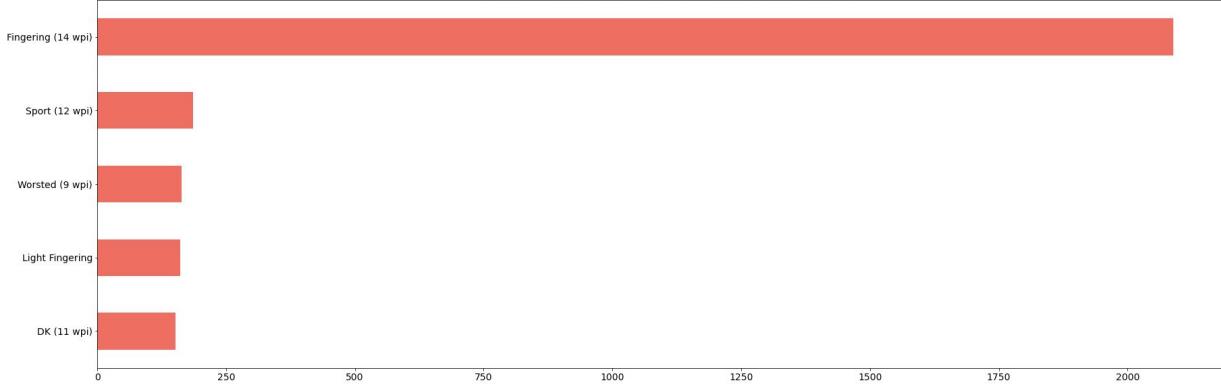


Yarn Weights for Most Popular Pattern Categories

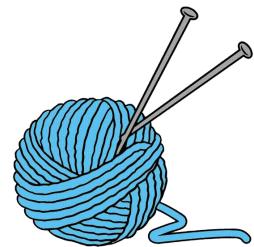
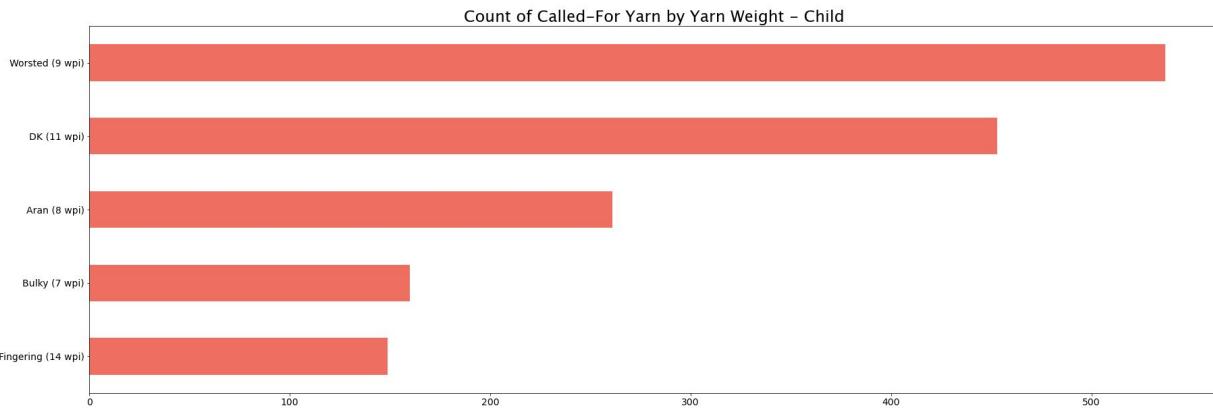
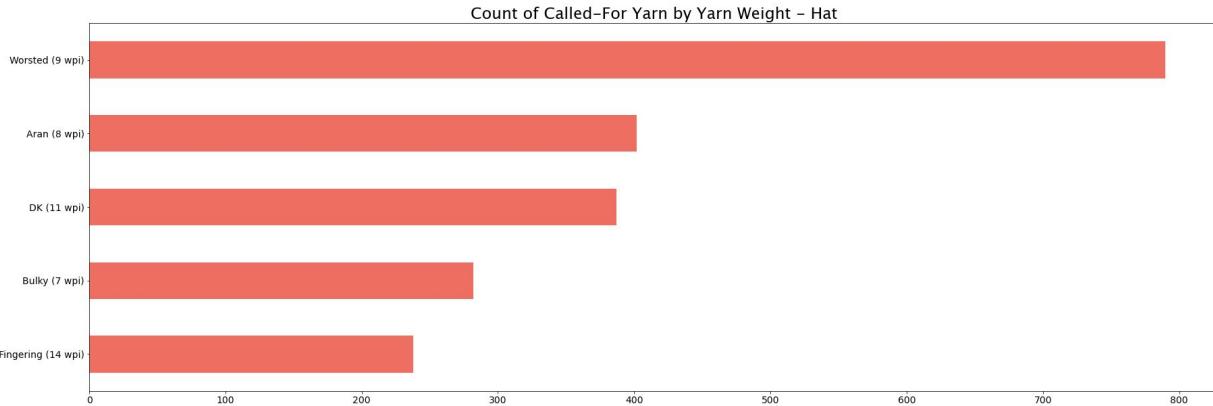
Count of Called-For Yarn by Yarn Weight – Shawl/Wrap



Count of Called-For Yarn by Yarn Weight – Socks

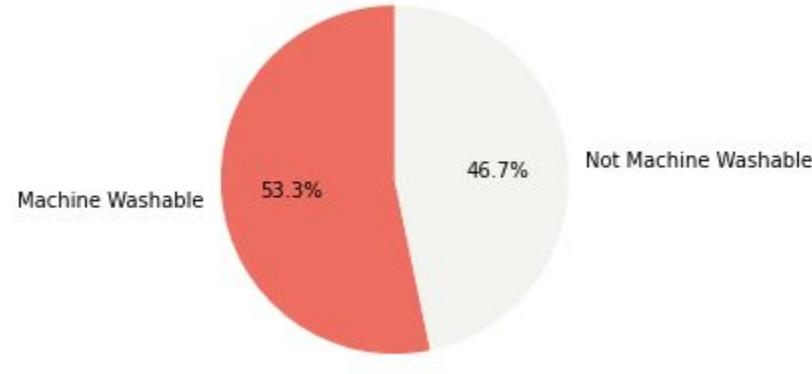


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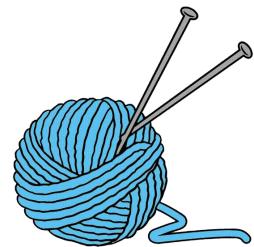


Machine Washable Yarns

Distribution of Machine Washable vs Non Machine Washable Yarns

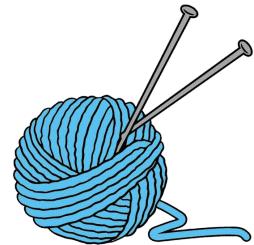


- Yarns with null value for machine washability assigned to category based on fiber type



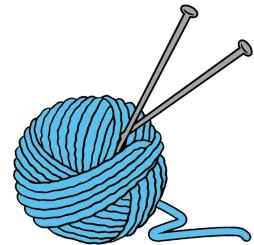
Summary

- 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



Areas for Further Analysis

- Refine potential shop locations using income, cost of living, and weather data
- Many more factors to consider regarding pattern and yarn popularity
 - Knitting techniques used
 - Difficulty rating
 - Yarn texture
 - Yarn fiber type



Data Sources

- Ravelry (<https://www.ravelry.com/>) - membership-based site
- US Census Bureau ([2019 Population Estimates](#))
- US Census Bureau ([County Shapefiles](#))

ravelry

