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| NOTES | SLIDE |
| Thank you for your time my name is \_\_\_\_\_\_\_\_\_ and I will be discussing findings from a study on craft beers in the US. |  |
| Washington DC will be included in the data analysis even though it is not technically a state.  Only one “microbrewery” in West Virgina, the Dakota’s, and DC.  Most microbreweries in CO with 47.  CA=39  MI=32  OR=29  TX=28  The federal gov’t didn’t legalize “home brewing” until 1978 but it wasn’t until 2013 that all 50 states could legally “home brew”…where success became “microbrewery” businesses. (Ref: <https://www.bizjournals.com/milwaukee/blog/2013/07/homebrewing-legal-in-all-50-states.html?page=all>    Ref to image “State with the Most Breweries Per Person” <https://priceonomics.com/where-is-craft-beer-most-popular-in-america/> |  |
| OPTIONAL SLIDE  Just quicly show how the breweries by state can differ when showing breweries by state per person.  The Rocky Mountains states and NE corners definitely enjoy craft beers. |  |
| Hit “W” key to view Ounces -> wide formate view  -The merged data contains 2410 craft beers and 558 breweries.  The merge was peformed by Brewery ID which existied in both  the beer and brewery data sets by renaming variables to ensure  a successful merge.  -Data is sorted by BreweryID  -Top 6 listing are from NorthGate Brewing out of Minneapolis, with all beers being 16 ounces |  |
| Hit “W” key to view Ounces -> wide formate view  -Bottom 6 Breweries include ID’s 556, 557, and 558 which confirms the statement about merging 558 breweries.  -The last 6 beers come from CA, NY, and AK breweries and are all 12 ounces |  |
| Two of the key parameters we will discuss are the Alcohol by Volume (ABV) and International Bitterness Units (IBU) or Bitterness Units for short.  When we analyze the data, we will ignore the beers with missing values for these 2 parameters.  The 62 missing AVB data points also had missing IBU data; so out of 2410 beers we will be analyzing 1405 beers. |  |
| Here we see Utah has the beer with the lowest ABV at 4%. This is a very conservative state and 4% is the max ABV by law.  Although DC only has 1 brewery (and isn’t technically as state), it’s brewery it tied with one from Kentucky for having the highest ABV at 6%.  Other states with high ABVs include Missouri, New Mexico, West Virginia, and Colorado.  Interesting to see Oregon in the middle of the pack. |  |
| A beer’s bitterness comes from the amount of hops brewers add to beer. Higher IBUs = more hoppy beer.  There’s one brewery in South Dakota and they did not report IBUs for there beer. Wisconson, Kansas, and Arizona round out the lowest IBUs.  Maine has a beer with the highest IBU and West Virginia and Florida follow. |  |
| Figure 2 showed the median ABV by state but the state with the highest ABV comes from Colorado.  It’s also interesting that it’s not a a small beer but 19.2 oz. |  |
| Although Oregon’s median IBU was in the middle of the pack from Figure 3, it actually has the beer with the highest IBU. |  |
| 62 NA’s match table 4 where we displayed the missing values (NA counts)  The mean and median are pretty close to each other with the mean at 0.056 and  The lowest ABV is not 0 but 0.001. Scotty K NA is the beer from Uncommon Brewers in Santa Cruz, CA and it is intended to be a low alcohol beer.  Of course on the other end of the spectrum is Colorado’s Lee Hill Series Vol 5 beer at 0.128 ABV.  The Inter Quartile Range is Q3-Q1 = 0.067-.05=.017  (middle 50%) |  |
| We wanted to see if there was a correlation between ABV and IBU. There are several data points away from the linear model but you can see moderately positive relationship.  With a r-squared of 0.4502, 45% of the data can be explained by the linear model. |  |
| he p-valule is much less than the 0.05 significance level so the correlation is statistically significant.  This is an observational study so the analysis is limited to the population of this study. |  |
| R-code and data in backup slide, in case someone wants to see it. |  |