Megan Donaghy and Max Cory
DCS 211
Lab 4
Oct. 24, 2025

1. How is the Appalachian Region defined? How many US States are included?

The Appalachian Region is defined as a region of 423 counties across 206,000 square miles and 13 states from Southern New York to Northern Mississippi. The Appalachian Region has 26.4 million residents who live across this area, which also includes three (nation recognized) Native American tribal communities and five (state recognized) tribal communities.

2. Provide some context on how rural Appalachia compares to the rest of rural America, specifically in:
   a. Population and demographics

Compared to the rest of rural America, rural Appalachia has shown higher rates of population decline by about 3.4%. Additionally, rural Appalachia has an older population (higher median age) than the rest of rural America.

In terms of demographics, rural Appalachia is less racially and ethnically diverse compared to the rest of rural America, with about half of the percentage of people of color that rural areas outside of the region have.

   b. Education

Education attainment within the Appalachian region is lower than that in rural areas outside of the region, with lower percentages inside the region for receiving high school or more and bachelor degrees or more in education. Of those who did receive a bachelor's degree, less people inside the region majored in science or engineering compared to outside the region. Levels of associate degrees, however, are relatively similar in and outside of Appalachia.

   c. Employment

Additionally, less people from the ages of 25 to 64 are employed in the civilian labor force inside Appalachian rural communities than in rural communities outside the region. The unemployment rate follows this pattern and is higher inside the region. Those who are employed have, on average, longer commutes than those outside of the Appalachian region as well.

   d. Income and poverty

Residents of rural Appalachia have lower income rates and higher poverty rates than residents of rural America by $10,000 (median household income) and 10%, respectively. There is also a wider income and poverty gap between children. A higher share of residents within rural Appalachia receive SNAP benefits.

      e. Broadband access

Broadband internet access is also lower within the Appalachian region than outside of the Appalachian region.

3. Briefly describe each of the five listed goals in the ARC's Strategic Plan for investing in the Appalachian Region

- Goal 1: Building Appalachian Businesses
  - This part of the plan seeks to invest in entrepreneurship and small businesses through financing and technical assistance. Along with this support, this goal also emphasizes pursuing economic and enterprise development strategies to grow existing industries as well. These two objectives will help strengthen and diversify Appalachia's economy by supporting these local businesses.
- Goal 2: Building Appalachia's Workforce Ecosystem
  - This goal aims to expand and strengthen community systems such as education, healthcare, housing, and childcare. It emphasizes the importance of a supportive environment for workforce development.
- Goal 3: Building Appalachia's Infrastructure
  - The focus here is to ensure that residents and businesses in Appalachia have access to reliable, affordable, and resilient utilities and infrastructure. Objectives include ensuring the availability of quality, affordable basic infrastructure, expanding access to telecommunications and broadband services, adopting alternative energy strategies, completing the Appalachian Development Highway System, and supporting the construction of business development sites and public facilities.
- Goal 4: Building Regional Culture and Tourism
  - This goal seeks to strengthen Appalachia's community and economic development potential by preserving and investing in the region's local cultural heritage and natural assets. It includes investing in the development of vibrant Appalachian downtowns and supporting Appalachian placemaking initiatives.
- Goal 5: Building Community Leaders and Capacity
  - The final goal focuses on investing in the capacity of local leaders, organizations, and communities to address local challenges. This involves providing technical assistance and support to access resources, engage partners, identify strategies and tactics, and conduct effective planning and project execution.

Inspecting the Data:
- Three Year Average Unemployment Rate:

- This indicator averages the number of unemployed persons over a three-year time span and divides by the total civilian labor force over that same span, then expresses the result as a percentage.
- Per Capita Market Income:
  - This measure takes the total personal income of a geographic area excluding transfer payments (such as unemployment benefits, pensions, disability payments, etc.), and divides that by the population of that area
- Poverty Rate:
  - This is the share (percentage) of persons in a given area whose income falls below the poverty threshold (for their family size/composition) out of the total number of persons for whom poverty status is determined.
- Poverty Threshold:
  - The dollar amount determined by the U.S. Census Bureau that varies by family size and the number of children (and age of members) and is used to judge whether a family's (or individual's) income is below a minimum level considered necessary to meet basic needs
  - Source: https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html

Data Analysis Definitions:
- Mean:
  - The mean is the average value of a dataset. In our case, it represents the average poverty level across all Appalachian counties.
- Standard Deviation:
  - The standard deviation of a dataset represents how close the values of the set are to the mean value. So a small standard deviation means most values in the dataset are close to the mean value, while a large standard deviation means the data is more spread out. In our case the std. Deviation represents how much the poverty level differs across counties.

11. Go back to your Python program and remove the thousands option when reading the CSV. What is the result of running your program, and why is that option needed? Include the answer in your Google Doc.
- From our analysis, it appears that removing the thousands option doesn't impact the ability to simply read and print the contents of the csv or calculate summary statistics across the entire data set. However, removing this option severely limits the ability of the python program to group the data by each state and then calculate summary statistics and therefore, prevents the table with state summary statistics from being created. It seems as

though the thousands option is needed to be able to split the data by variable values and analyze on, in this case, a state level, rather than the whole dataset.

15. In your Google Doc, reflect on what you observe in your data tables. What do you notice about top vs. bottom poverty rates? Average unemployment? PCI? Are there counties that seem to be in conflict even within the same state?
- Poverty rates: It appears as though there are very significant differences between the top and bottom counties in terms of poverty rates. While the most impoverished counties are experiencing about half of their population below the poverty line, while the least impoverished counties have single-digit percentages. This tells us that there is a wide range of poverty depending on the county, and that some counties struggle significantly, with nearly half or over half of their population living in poverty.
- Average unemployment: The top vs. bottom average unemployment rates are less significantly different than poverty rates. That being said, there are still large differences by county, with almost a quarter of the population unemployed in the most severe case, and just below 2% of the population unemployed in the least severe case.
- Per capita income: The top vs. bottom average per capita income show massive differences across counties, with the sum of the highest 10 counties being roughly $2,283,060 and the sum of the lowest 10 counties being roughly $141,624. Interestingly, the highest counties in terms of per capita income seem as though they are either tourist locations or big cities, for example Teton, Wyoming and Pitkin, Colorado are famous for their mountains, and New York, NY is one of the largest and wealthiest cities in the world.
- Some counties within a single state appear in both the highest and lowest rankings. For example, counties in Texas appear in both the highest and lowest levels of poverty and unemployment, and counties in Colorado appear in the highest and lowest levels of income.

Do some investigation (e.g., Wikipedia or other online resources) about these same-state counties that seem in conflict, and provide some information about why this might be the case. Cite your source(s).
- Dimmit County, Texas (Poverty Rate: 46.50%) vs. Loving County, Texas (Poverty Rate: 1.20%)
    - This conflict might be due to Dimmit County's stuggles with crime and Loving County's oil wealth. According to their Wikipedia pages, Dimmit County has struggled with crime across the Mexican border and Loving County has a small but relatively wealthy population due to the oil industry.

- Starr County, Texas (Unemployment Rate: 14.6%) vs. Hartley County, Texas (Unemployment Rate: 1.9%)

- This conflict could be due to Starr County's struggles with drug smuggling, as according to Wikipedia, this is something that law enforcement in the area has focused its efforts on. Starr County also has low income rates, which could also help explain lack of employment. Hartley County, on the other hand, does not seem to have the same potential drug issues and has mugh higher average incomes.

- Pitkin, Colorado (PCI: $187,887.00) vs. Crowley, Colorado (PCI: $14,468.00)
    - Pitkin County's high PCI can be explained by the city of Aspen, as Aspen is a major ski/mountain town that attracts visitors and residents from across the country and the world. In contrast, Crowley County has no attraction similar to Aspen, and mainly appears to be a rural ranching county.

Sources:

Wikipedia contributors. (2025, September 3). Crowley County, Colorado. In *Wikipedia, The Free Encyclopedia*. Retrieved 13:27, October 28, 2025, from https://en.wikipedia.org/w/index.php?title=Crowley_County,_Colorado&oldid=1309358666

Wikipedia contributors. (2025, September 7). Dimmit County, Texas. In *Wikipedia, The Free Encyclopedia*. Retrieved 13:26, October 28, 2025, from https://en.wikipedia.org/w/index.php?title=Dimmit_County,_Texas&oldid=1310085256

Wikipedia contributors. (2025, September 9). Hartley County, Texas. In *Wikipedia, The Free Encyclopedia*. Retrieved 13:27, October 28, 2025, from https://en.wikipedia.org/w/index.php?title=Hartley_County,_Texas&oldid=1310384972

Wikipedia contributors. (2025, October 25). Loving County, Texas. In *Wikipedia, The Free Encyclopedia*. Retrieved 13:26, October 28, 2025, from https://en.wikipedia.org/w/index.php?title=Loving_County,_Texas&oldid=1318735278

Wikipedia contributors. (2025, September 19). Starr County, Texas. In *Wikipedia, The Free Encyclopedia*. Retrieved 13:26, October 28, 2025, from https://en.wikipedia.org/w/index.php?title=Starr_County,_Texas&oldid=1312283874

Wikipedia contributors. (2025, October 17). Pitkin County, Colorado. In *Wikipedia, The Free Encyclopedia*. Retrieved 13:27, October 28, 2025, from https://en.wikipedia.org/w/index.php?title=Pitkin_County,_Colorado&oldid=1317249242