

## Lab 4 Writeup DCS211

Lando and Yuka

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

The Appalachian region is defined as a collection of 423 counties spread throughout parts of Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia, and all of West Virginia (13 states) along the Appalachian mountain range.

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

- population and demographics
- education
- employment
- income and poverty
- broadband access

Population: 26,554,853 million residents

Demographics:

- Poverty Rate: 14.3%
- Appalachia's Median household Income: 64,588 USD
- U.S. Median household income: 78,538 USD

Education:

- 90% of Appalachian adults ages 25-64 have a high school diploma
- 28.8% hold a bachelor's degree.
- 39% of the U.S. holds a bachelor's degree or higher

Employment:

- Appalachia: 4.1% unemployment
  - 95.9% of Appalachia's labor force is employed.
- General U.S.: 3.9% unemployment

Broadband access:

- 92% of Appalachian households have access to a computer, smartphone or other device compared to 95% average in American households
- 86.2% of Appalachian households have a broadband subscription compared to ~90% of U.S. households

3. Briefly describe each of the five listed goals in the ARC's Strategic Plan for investing in the Appalachian Region (<https://www.arc.gov/strategicplan/>).

Goal 1: Building Appalachian businesses

- Involves expanding economic development strategies and investments in entrepreneurship

#### Goal 2: Building Appalachia's workforce ecosystem

- Focuses on strengthening community systems (education, healthcare, housing, childcare, etc.)

#### Goal 3: Building Appalachia's infrastructure

- Trying to ensure residents and businesses have access to reliable, affordable, and resilient utilities and infrastructure

#### Goal 4: Building Regional Culture and Tourism

- Strengthening Appalachia's community and economic development by preserving and investing in region's cultural and natural assets

#### Goal 5: Building Community Leaders and Capacity

- Invests in capacity of local leaders and organizations to address local challenges by providing technical assistance and support to access resources

<https://www.arc.gov/distressed-designation-and-county-economic-status-classification-system/>

#### Three pieces of data to focus on:

- (Three-year) average unemployment rate (in percentage):
  - Measures the structural unemployment over a long term. It is determined by dividing the three-year sum of the total people unemployed by the three-year sum of the civilian labor force.
- Per capita market income:
  - Determined by subtracting transfer payments from the sum of total personal income, then dividing the result by total population. Transfer payments include retirement and disability insurance benefit payments, medical payments, income maintenance benefit payments, unemployment insurance benefit payments, veterans benefit payments and other such payments
- Poverty rate:
  - Poverty rate is determined by dividing the total number of people living below the poverty threshold by the total number of people in the group.
- Poverty threshold
  - "Poverty thresholds and poverty guidelines are dollar amounts set by the U.S. government to indicate the least amount of income a person or family needs to meet their basic needs." - [Institute for Research on Poverty at University of Wisconsin-Madison](#)
  - Poverty threshold for family of four 2023 - \$31,008 annual income

#### **Lando:**

Write a function named `printTableBy()` having the following parameters:

- the overall pandas data frame
- a field (column name, a string) to select by (e.g., 'poverty\_rate') \
- how many to include (an integer), e.g., 10 for top-ten

- a title (string) to display just before the PrettyTable

Function should sort data based on the given field, and then in a PrettyTable:

- print the top how-many based on that field, sorted by decreasing order (e.g., decreasing poverty rate)
- print a separator (see the divider argument when adding a row in PrettyTable)
- print the bottom how-many based on that field, sorted by increasing order (e.g., increasing poverty rate).

### Yuka:

Write a function named `createByStateBarPlot()` having five parameters:

- the ARC data as a pandas data frame
- a field (column name, a string) to select by (e.g., 'poverty\_rate')
- a filename (string) into which your figure will be saved
- a title (string) to appear at the top of your figure
- a y-label (string) to appear on the left of your figure, which will characterize the data labels appearing on your left axis.

Your bar plot should be grouped by state (refer back to the class notes for help on using `groupby`), compute the mean of the given field, sort in increasing order, and then produce a bar plot with appropriate labels.