ANALYSIS ECONOMIC INEQUALITY AND IDENTIFYING FACTORS DRIVING DISPARITIES

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DEPT CODE :104.

DEPT NAME:COMPUTER SCIENCE AND ENGINEERING.

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ABSTRACT:

This study employs a multidimensional approach to analyze economic inequality and identify the factors driving disparities, focusing on income distribution, customer behavior, marketing strategies, and personalized marketing. Drawing on diverse datasets encompassing income distribution, consumer behavior, and marketing practices, the research investigates the intricate interplay between these factors and their impact on economic inequality.

Through statistical analysis and regression modeling, the study uncovers correlations between income levels, consumer behaviors, and marketing strategies. Findings reveal how disparities in income distribution influence consumer spending patterns and brand preferences, while marketing strategies, including personalized marketing, further shape purchasing behaviors and market segmentation.

The research yields policy recommendations for policymakers and businesses to foster more equitable marketing practices and mitigate economic inequality. By integrating insights from economics, marketing, and social sciences, this study offers a holistic understanding of the factors driving economic disparities and pathways for creating a more inclusive and sustainable economy.

INTRODUCTION:

Economic inequality poses a significant challenge to societal well-being, with implications for social cohesion and economic progress. This project adopts a multidimensional approach to explore the drivers of inequality, focusing on income distribution, consumer behavior, and marketing strategies. By analyzing these factors, we aim to uncover the complex interactions that perpetuate disparities in wealth and access. Through statistical analysis and examination of case studies, we seek to provide actionable insights for policymakers and businesses striving to address economic inequality. Our research contributes to the ongoing discourse on building more equitable societies and fosters dialogue among stakeholders committed to promoting social welfare and prosperity.

METHODOLOGY:

Define Objectives:

- ➤ Clearly define the research question: What specific aspect of economic inequality are you examining?
- ➤ Set goals: Identify the outcomes you want to achieve, such as understanding income distribution, wealth gaps, or identifying socio-economic factors contributing to inequality.

Data Collection:

- ➤ Identify data sources: Gather data from reliable sources such as government databases, economic surveys, census data, international organizations (e.g., World Bank, OECD), and academic research.
- ➤ Data types: Include various data types such as income, wealth, employment, education, healthcare access, demographic information, and geographic data.

Data Preparation:

- ➤ Data cleaning: Handle missing values, remove duplicates, and correct errors in the dataset.
- ➤ Data transformation: Normalize or standardize data, create new variables if needed, and ensure the data is in a usable format for analysis.

Data integration:

- ➤ Combine data from different sources to create a comprehensive dataset.

Exploratory Data Analysis (EDA):

- ➤ Descriptive statistics: Calculate mean, median, mode, range, and standard deviation to understand the data distribution.
- ➤ Data visualization: Use histograms, box plots, scatter plots, and density plots to visualize the distribution and identify patterns.
- ➤ Correlation analysis: Identify relationships between variables using correlation matrices and scatter plot matrices.

Quantitative Analysis:

- ➢ Regression analysis: Use linear regression, multiple regression, or logistic regression to identify the impact of different variables on economic inequality.
- ➢ Decomposition analysis: Apply methods like Oaxaca-Blinder decomposition to understand the contribution of different factors to income gaps.
- ➢ Inequality indices: Calculate indices like Gini coefficient, Theil index, and Lorenz curve to measure inequality levels.

Machine Learning Techniques:

- ➢ Clustering: Use clustering algorithms (e.g., k-means, hierarchical clustering) to group regions or populations with similar economic characteristics.
- ➢ Classification: Apply classification algorithms (e.g., decision trees, random forests) to predict which factors are most indicative of economic disparity.
- ➢ Predictive modeling: Develop models to forecast future trends in economic inequality based on current data.

Causal Inference:

- ➢ Instrumental variables: Use instrumental variables to address endogeneity issues in regression models.
- ➢ Difference-in-differences (DiD): Apply DiD to estimate the causal effect of policies or interventions on economic inequality.
- ➢ Propensity score matching: Use matching techniques to control for confounding variables and estimate treatment effects.

Policy Analysis:

- ➢ Evaluate policies: Assess the impact of existing policies on economic inequality using the results from quantitative analysis.
- ➢ Policy simulation: Use simulation models to predict the potential effects of proposed policies on economic inequality.

Reporting and Visualization:

- ➢ Dashboard creation: Develop interactive dashboards using tools like Tableau or Power BI to present findings.

- Reports and presentations: Prepare comprehensive reports and presentations for stakeholders, highlighting key insights and policy recommendations.
- Visual storytelling: Use infographics and visual narratives to make complex data more accessible and understandable to a broader audience.

Continuous Monitoring and Evaluation:

- Regular updates: Continuously update the data and analysis to monitor changes in economic inequality over time.
- Feedback loop: Incorporate feedback from stakeholders and refine the analysis methodology as needed.
- Impact assessment: Periodically assess the impact of implemented policies and interventions on economic inequality.

EXISTING WORK:

Existing work for analyzing economic inequality and identifying factors driving disparities includes reviewing academic research, government reports, and nonprofit publications. Additionally, utilizing economic indicators, data visualization platforms, and literature reviews can provide valuable insights. By drawing upon these existing resources, researchers can gain a comprehensive understanding of economic inequality dynamics and inform policy decisions effectively.

PROPOSED WORK:

The project will involve gathering diverse datasets on income distribution, consumer behavior, and marketing strategies. Statistical analysis will explore correlations between economic inequality and factors like income levels and marketing strategies. Visualizations will illustrate trends in economic inequality. Industry case studies will highlight effective approaches in addressing economic inequality through marketing. Policy recommendations will be generated based on research findings.

SYSTEM REQUIREMENTS:

SOFTWARE REQUIRMENTS:

1. Cognos Analytics (IBM Tool): For advanced data visualization, reporting, and business intelligence functionalities.

2. Visual Studio: For web development using Python frameworks like Flask or Django, providing an integrated environment for coding, debugging, and collaboration.

3. Python Libraries: Pandas for data manipulation, NumPy for numerical computing, Matplotlib and Seaborn for static visualizations, and Plotly or Bokeh for interactive visualizations.

IMPLEMENTATION DETAILS:

WORKFLOW DIAGRAM:
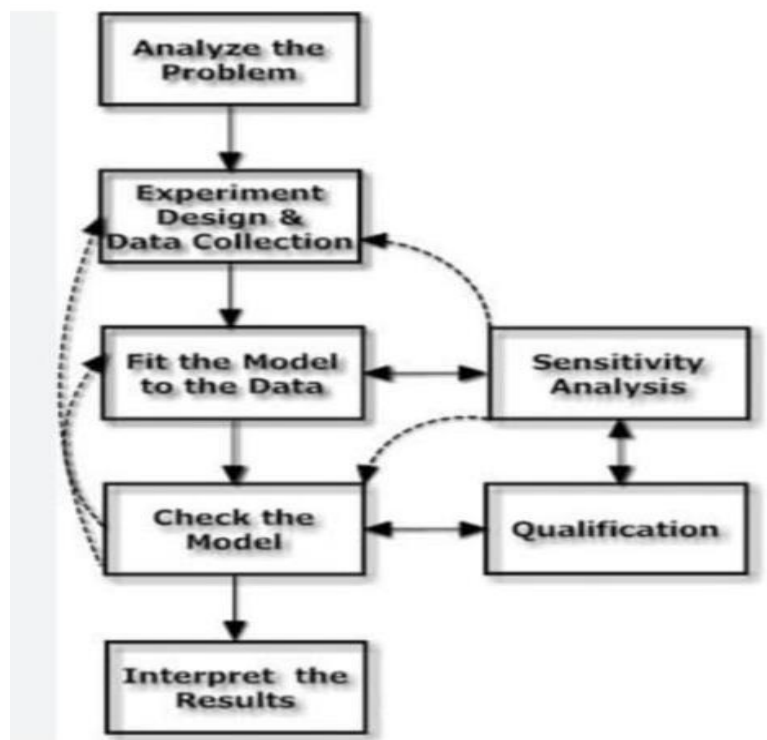
DATA COLLECTION AND PRE-PROCESSING:
DATA ACQUISATION AND PREPARATION:

> ### DATA COLLECTION METHODS:

  - ❖ Download or access the datasets in a format compatible with your analysis tools (e.g., CSV, Excel, JSON, or API).
  - ❖ Ensure that the datasets cover the relevant time periods, geographic regions, and demographic groups for your analysis.
    https://us3.ca.analytics.ibm.com/bi/?perspective=home&folder=i5CFEF96751 2946C995F47756DD60E7D8

> ### DATA CLEANING:

  - ❖ Review the dataset to identify potential data quality issues, such as missing values, duplicate records, incorrect data types, and outliers
  - ❖ Impute missing values using methods such as mean, median, mode imputation, or more advanced techniques like regression imputation or k-nearest neighbors (KNN) imputation.
  - ❖ Identify outliers in the dataset using statistical methods or visualization techniques.

> ### DATA INTEGRATION:

  - ❖ Data integration involves combining data from different sources or formats into a unified dataset. Here's a succinct explanation in three lines
  - ❖ Merge datasets based on common identifiers.
  - ❖ Handle data conflicts and inconsistencies.
  - ❖ Transform and aggregate data for analysis.

> **Data Transformation and Scaling:**

- ❖ Transform variables if necessary (e.g., logarithmic transformation of income variables to address skewness).
- ❖ Scale variables to a common range if they have different units or magnitudes to ensure comparability (e.g., standardizing variables to z-scores).

DATA MODULE CONVERSION:

> **DATA CLEANING:**

- ❖ Convert data modules to a standardized format for cleaning, such as CSV or Excel.
- ❖ Perform data cleaning operations, including handling missing values, correcting errors, and removing duplicates.
- ❖ Export the cleaned data modules back to their original format or another standardized format for further analysis or integration.
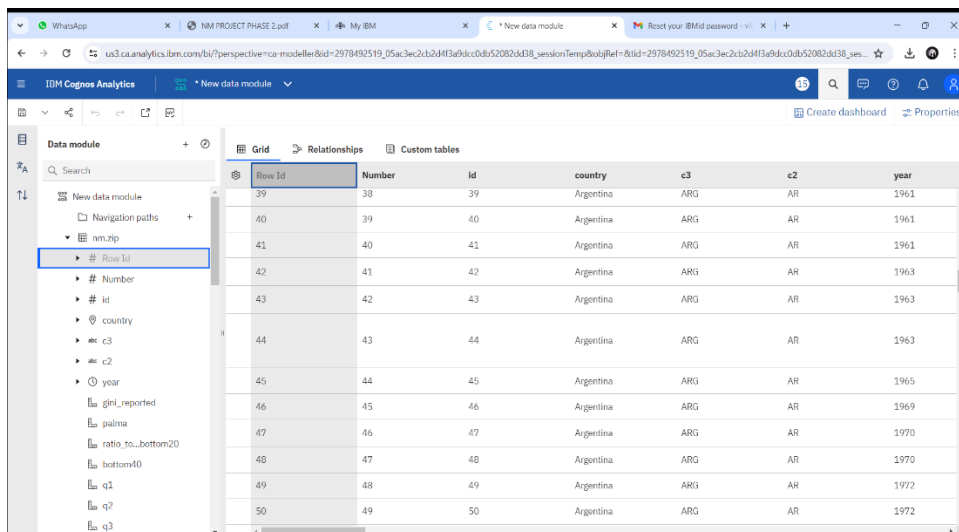
> **DATA INTEGRATION**:

- ❖ The integration process began by identifying common identifiers such as unique keys, timestamps, or other relevant variables shared across different datasets.
- ❖ Challenges arose due to inconsistencies in data formats, particularly when merging datasets from CSV, Excel, or other file formats. Converting these formats into a standardized structure was essential for seamless integration.
- ❖ Data transformation techniques were applied to harmonize data across disparate sources. This involved standardizing units of measurement, resolving formatting inconsistencies, and imputing missing values.

- ➢ **DATA TRANSFORMATION**:

  - ❖ **Normalization:** Scaling numerical variables to a common range, such as min-max normalization or z-score normalization, to ensure comparability and facilitate analysis.
  - ❖ **Scaling:** Adjusting the scale of numerical variables to address differences in magnitude, particularly when integrating data from diverse sources with varying measurement units.
  - ❖ **Encoding:** Converting categorical variables into numerical representations through techniques like one-hot encoding or label encoding to enable machine learning algorithms to process the data.
  - ❖ **Transformation:** Applying mathematical transformations, such as logarithmic or exponential transformations, to numerical variables to address skewness or improve model performance.

SCREENSHOTS:

1. DATA EXPLORATION:

- ➢ **DATA VISUALIZATION:**

  - ❖ Data visualization is the graphical representation of information and data. By using visual elements like charts, graphs, and maps, data visualization

tools provide an accessible way to see and understand trends, outliers, and patterns in data.

❖ This visual representation helps people make sense of complex datasets by presenting them in a format that is easier to comprehend and analyze.

❖ Line graph, Bar graph, Histogram, Pie chart, Scatter plot, Box plot, Area chart, Bubble chart, Radar chart, Waterfall chart.

➢ **ANOMALY DETECTION:**

❖ Anomaly detection is a technique used in data analysis and machine learning to identify patterns that do not conform to expected behavior.

❖ Statistical methods (e.g., z-score, Grubbs' test). Machine learning algorithms (e.g., Isolation Forest, One-Class SVM).

➢ **INSIGHTS:**

❖ Insights can refer to valuable understandings or perspectives gained from data analysis, observation, or introspection. In the context of data analysis, insights often involve discovering patterns, trends, correlations, or anomalies that provide deeper understanding or actionable information.

❖ **Visual insights:** Data visualization techniques such as charts, graphs, and dashboards can help communicate insights effectively by making complex information more understandable and accessible.

❖ **Qualitative insights:** While quantitative data analysis is essential, qualitative insights gained from interviews, surveys, or observations can provide rich context and deeper understanding of underlying motivations or behaviors.
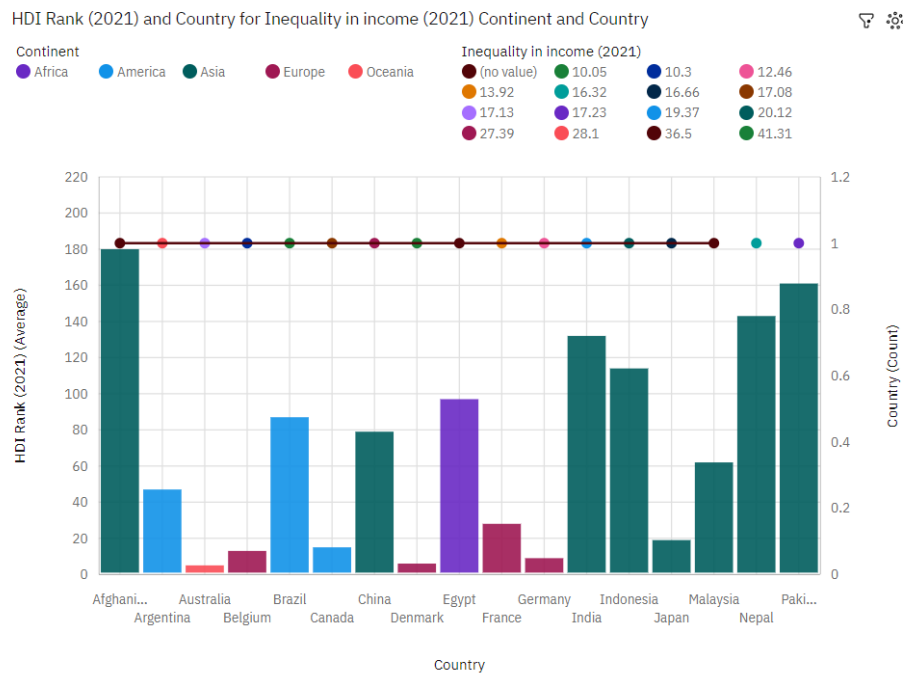
2. **INSIGHTS FOR FURTHER ANALYSIS:**

➢ **LINE GRAPH:**
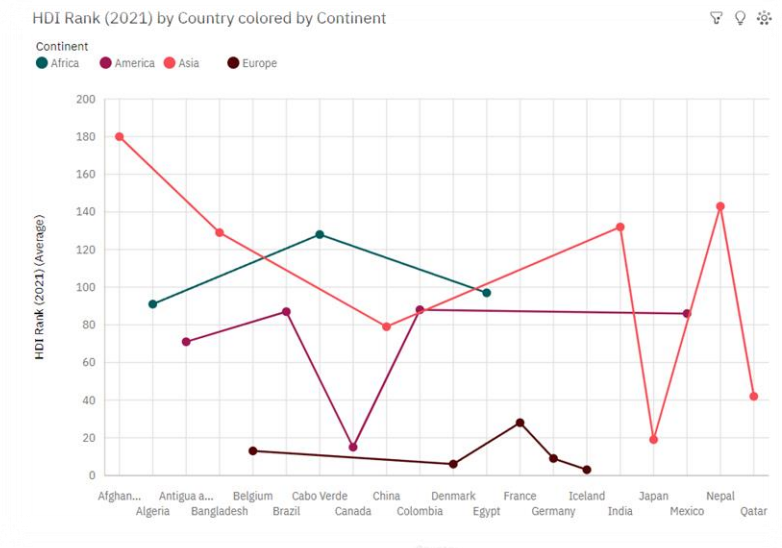
INSIGHTS:

- **Graph Title**: "HDI Rank (2021) by Country colored by Continent"
- **X-Axis Label**: "Country" (listing various countries from different continents)
- **Y-Axis Label**: "HDI Rank (2021)" (values ranging from 0 to 200)

SCATTER AND BAR GRAPH:

➢ **INSIGHTS :**

➢ **Title**: "HDI Rank (2021) by Country colored by Continent"

➢ **X-Axis Label**: "Country" (listing various countries from different continents)

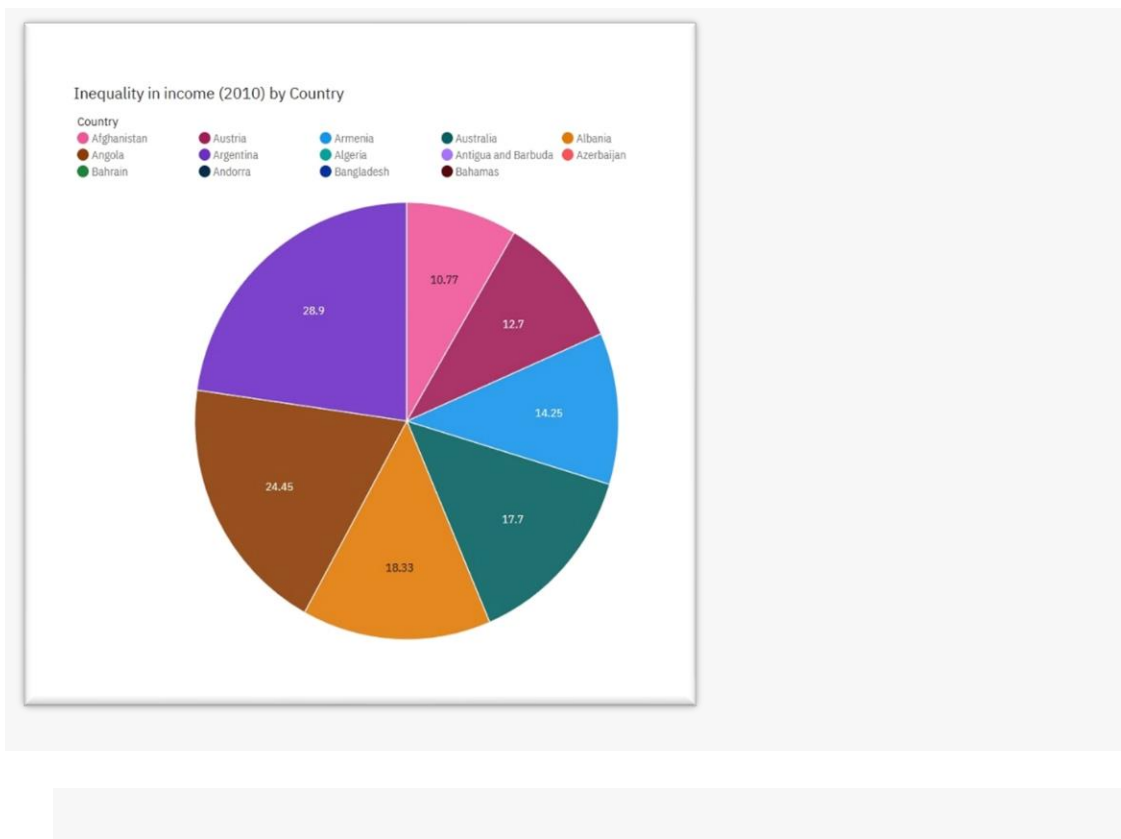➢ **Y-Axis Label**: "HDI Rank (2021)" (values ranging from 0 to 200)

➢ **Color Coding**: The points on the scatter plot are color-coded by continent: Africa (red), America (blue), Asia (green), Europe (purple), and Oceania (brown).

➢ **Purpose**: This scatter plot visually compares the HDI ranks of countries across different continents, providing insights into patterns or trends in human.

➢ **PIE CHART:**

➢ **INSIGHTS:**

➢ **United States (US):** The US has a significant share of income inequality. A small percentage of the population holds a disproportionately large portion of the country's wealth.

➢ **China:** Despite rapid economic growth, China also faces income inequality. The gap between the rich and the poor remains substantial.

- ➢ **India:** India struggles with income inequality as well. While the country has made progress in poverty reduction, disparities persist.
- ➢ **Brazil:** Brazil's income distribution is skewed, with a relatively small elite controlling a substantial portion of the wealth.
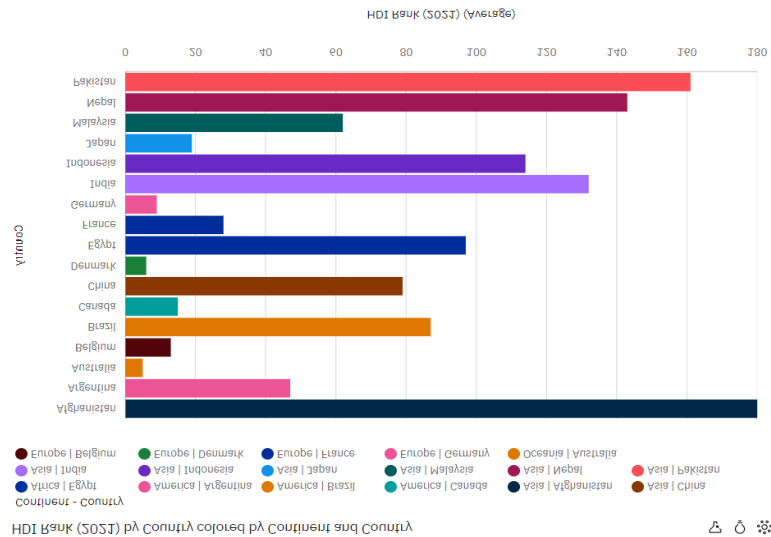
➢ BAR GRAPH:
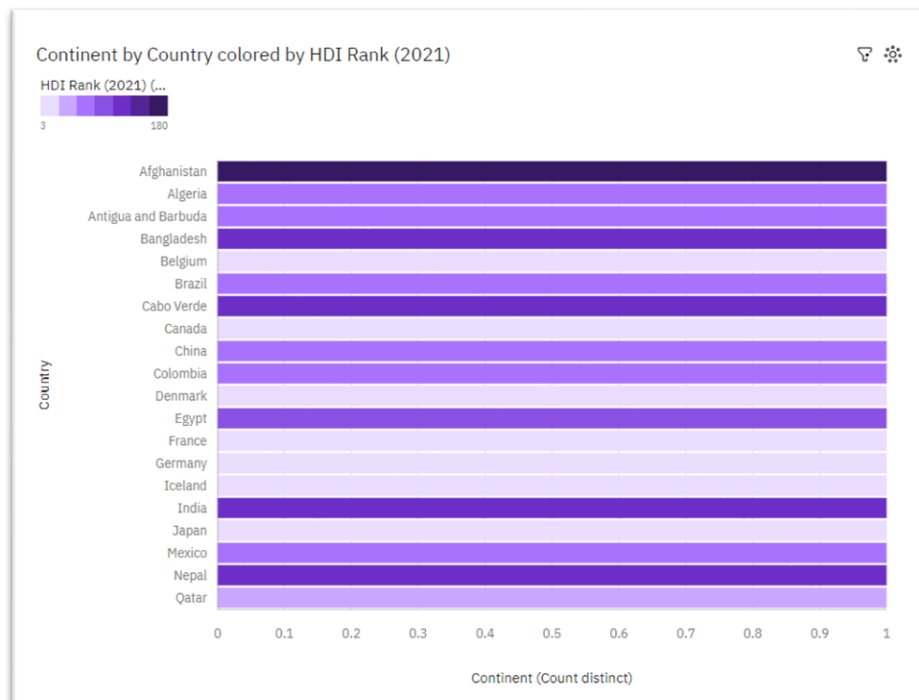
Continent by Country colored by HDI Rank (2021)

➢ INSIGHTS:

- ➢ **Title**: "Inequality in Income (2021) by Country"
- ➢ **X-Axis Label**: "Country" (listing the same countries as in the scatter plot)
- ➢ **Y-Axis Label (Left)**: "HDI Rank (2021)" (corresponding to the scatter plot)
- ➢ **Y-Axis Label (Right)**: "Inequality in Income" (values representing income inequality)
- ➢ **Legend**: The legend at the top right corner indicates two sets of data: "Inequality in Income" with corresponding colors for each continent and "HDI Rank (2021)" with black dots.
- ➢ **Purpose**: This bar graph shows the inequality in income for the same countries, allowing for comparison between HDI ranks and income inequality

➤ STACKED BAR GRAPH:

➤ INSIGHTS:

- ➤ **Title**: "Inequality in Income (2021) by Country"
- ➤ **X-Axis Label**: "Country" (listing the same countries as in the scatter plot)
- ➤ **Y-Axis Label (Left)**: "HDI Rank (2021)" (corresponding to the scatter plot)
- ➤ **Y-Axis Label (Right)**: "Inequality in Income" (values representing income inequality)
- ➤ **Legend**: The legend at the top right corner indicates two sets of data: "Inequality in Income" with corresponding colors for each continent and "HDI Rank (2021)" with black dots.
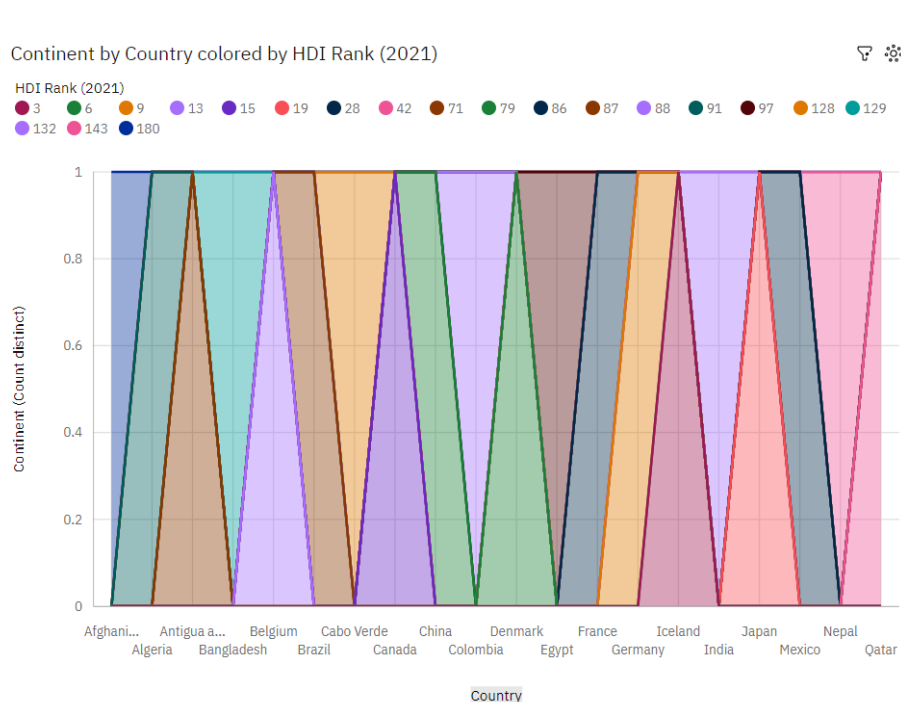
➤ TREE MAP:
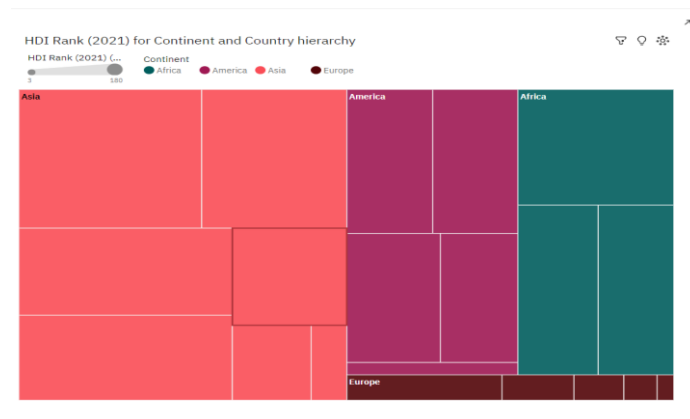
➢ **INSIGHTS:**

➢ The treemap is divided into colored blocks, each representing a continent (Asia, Africa, America, and Europe).

➢ The size of each block corresponds to the HDI rank of countries within that continent.

➢ **Asia** appears to have the highest number of countries with relatively lower HDI ranks, as indicated by the larger pink/red blocks.

➢ **Africa** shows a mix of countries with varying HDI ranks, represented by the green blocks.

➢ **America** (presumably North and South America combined) has a range of HDI ranks, depicted by the purple blocks.

➢ **Europe** seems to have a concentration of countries with higher HDI ranks, reflected in the maroon/dark purple blocks.

➢ **AREA:**

Continent by Country colored by HDI Rank (2021)

HDI Rank (2021)
● 3 ● 6 ● 9 ● 13 ● 15 ● 19 ● 28 ● 42 ● 71 ● 79 ● 86 ● 87 ● 88 ● 91 ● 97 ● 128 ● 129 ● 132 ● 143 ● 180
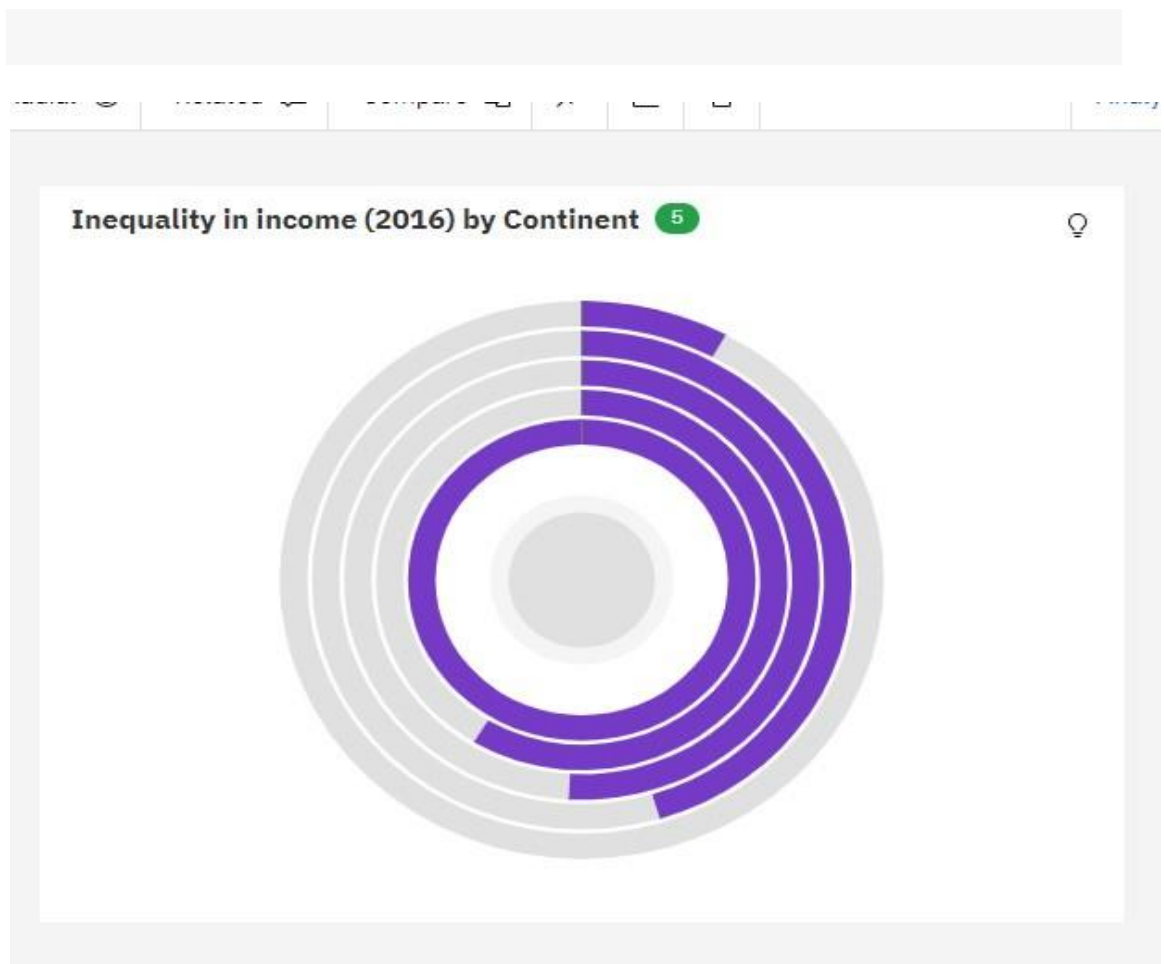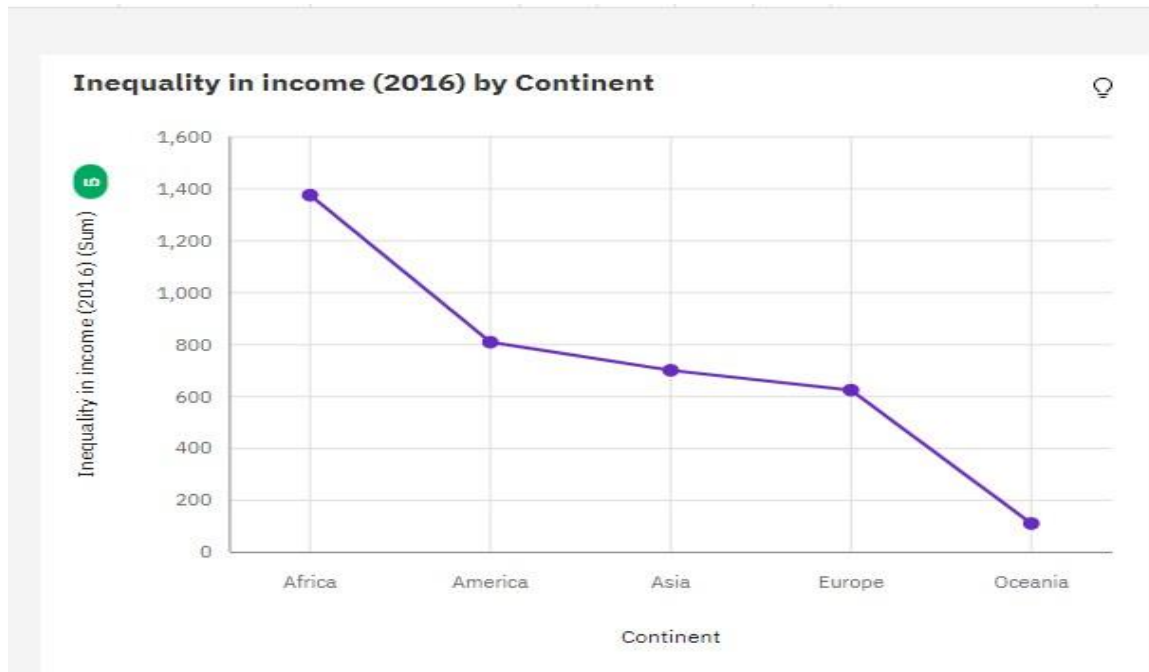
➢ **INSIGHTS:**

➢ The graph allows us to observe how countries' HDI ranks have changed over time. Some countries consistently improved their ranks, while others experienced fluctuations.

- The graph allows us to observe how countries' HDI ranks have changed over time. Some countries consistently improved their ranks, while others experienced fluctuations.
- Look for countries with upward-sloping lines; these indicate progress in human development.
- Regional Comparisons:
- Group countries by region (e.g., Asia, Europe, Africa) and analyze their trajectories. Are there common trends within regions?
- For instance, Scandinavian countries (like Norway, Sweden, and Denmark) tend to have high HDI ranks consistently.

Inequality in income (2016) by Continent

- **Insights:**
- Across all continents, the sum of Inequality in income (2016) is over 3500.
- Inequality in income (2016) ranges from 108.5, when Continent is Oceania, to almost 1500, when Continent is Africa.
- Inequality in income (2016) is most unusual when Continent is Africa and Oceania.

Inequality in income (2016) by Continent
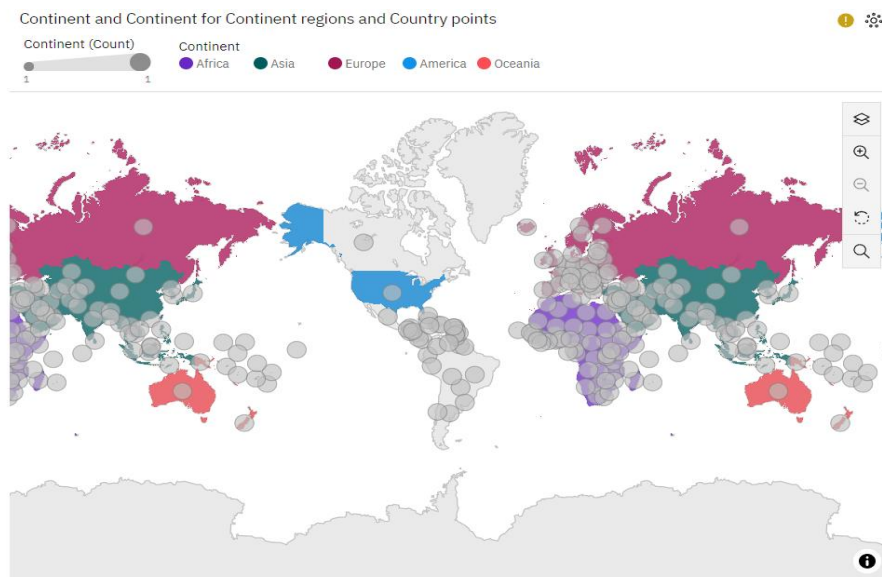
> **Insights:**

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> **MAP:**

Continent and Continent for Continent regions and Country points

INSIGHTS:

- **Regional Disparities**: The distribution of circles across continents suggests that certain regions have more data points than others. For instance, if the circles are related to economic indicators (such as GDP or population), we might observe larger circles in Asia due to its large population and economic activity.
- **Magnitude of Metrics**: The size of each circle likely corresponds to the magnitude of a specific metric. Larger circles could represent higher values, while smaller ones may indicate lower values. Analyzing the legend could reveal which metrics are being visualized.
- **Patterns and Trends**: By comparing circles within a continent or across continents, we can identify patterns and trends. For example, if the circles represent COVID-19 cases, we might notice spikes in certain regions during specific time periods.
- **Outliers and Anomalies**: Any unusually large or small circles could be outliers. Investigating these outliers might reveal interesting phenomena or anomalies.
- **Correlations**: We can explore correlations between different metrics. For instance, if the circles represent education levels and healthcare spending, we could analyze whether countries with higher education levels tend to spend more on healthcare.
- **Geopolitical Insights**: The visualization could provide geopolitical insights. For instance, if the circles represent military strength, we might observe clusters of large circles around certain regions due to military alliances or conflicts.
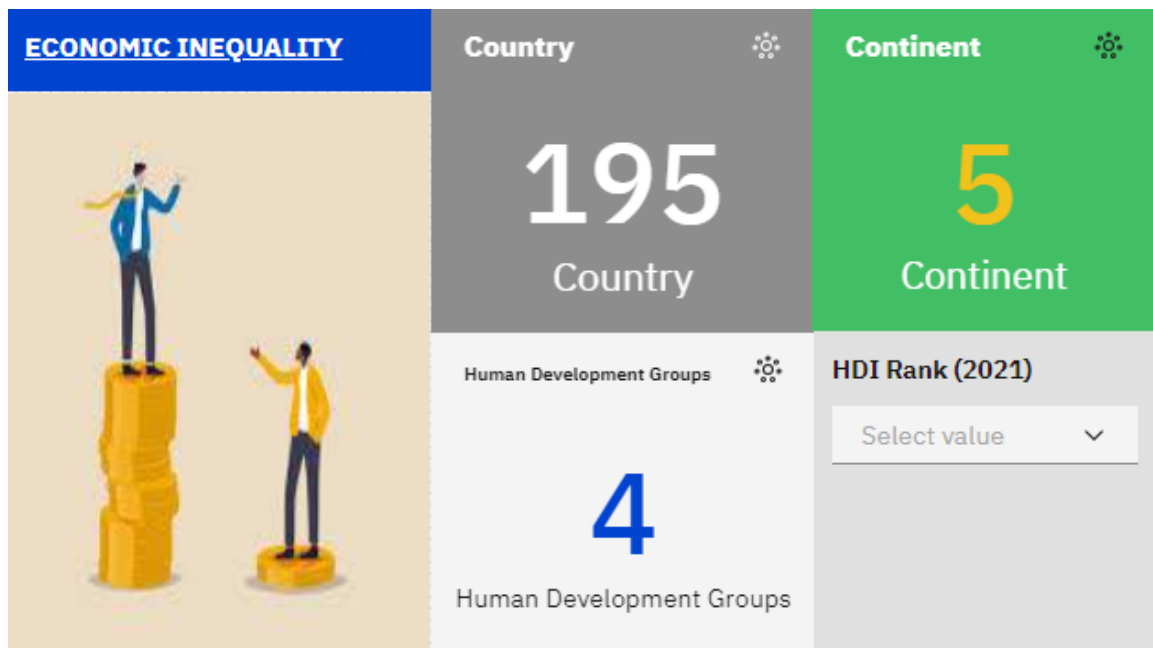
DASHBOARD CREATION:

DASHBOARD LINK:

https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2Feconomic%2Binequality%2Bdashboard&action=view&mode=dashboard&subView=model0000018f6c2095c7_00000002

DASHBOARD 1:

INTRO-PAGE DASHBOARD:

COUNTRY:

The overall number of results for **Country** is **195**.

CONTINENT:

➢ Hemisphere Southern Hemisphere has the lowest Continent at 4.0.

➢ Hemisphere Northern Hemisphere has the highest Continent at 5.0.

➢ The overall number of results for Continent is 195.

HUMAN DEVELOPMENT GROUPS:

➢ Continent Europe has the lowest Human Development Groups at 2.0, followed by Oceania at 3.0.

➢ Continent Africa and America have the highest Human Development Groups at 4.0.

➢ The overall number of results for Human Development Groups is 191.

DASHBOARD 2:
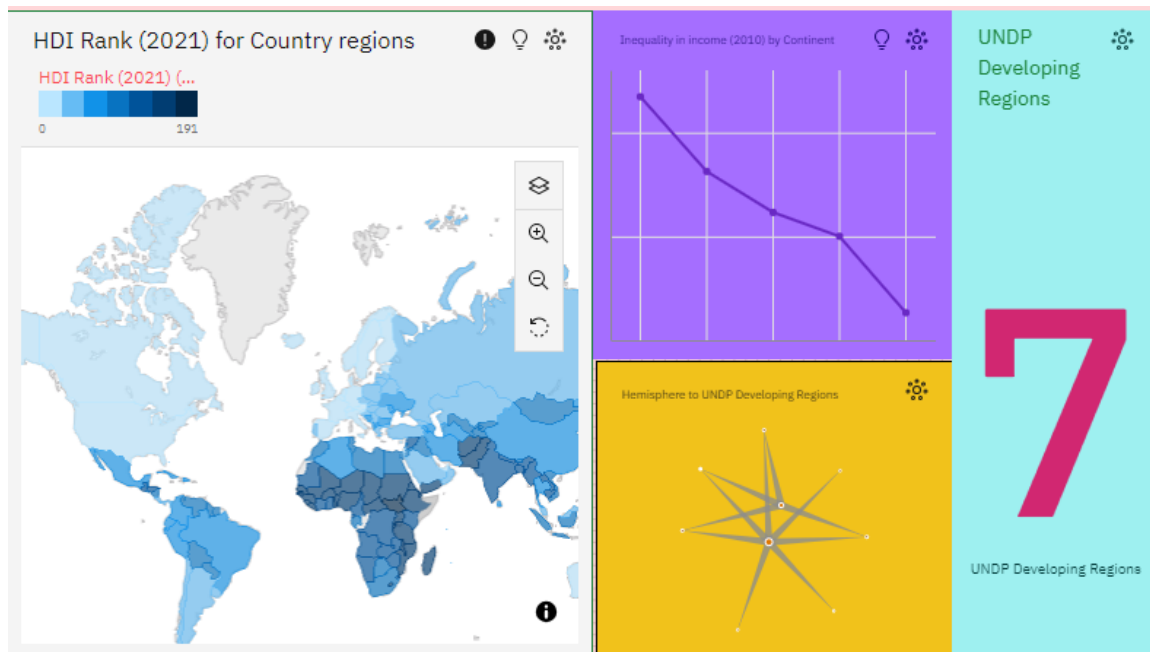
HDI RANK(2021) FOR COUNTRY REGIONS:

➢ Continent Africa has the highest HDI Rank (2021) at 8,116, out of
which Country South Sudan contributed the most at 191.

➢ Country South Sudan HDI Rank (2021) from Continent Africa is 191,
whereas Chad is only 190.

➢ Country South Sudan has the highest average HDI Rank (2021) due to

➢ Continent Africa.

INEQUALITY IN INCOME(2010) BY CONTINENT:

➢ Continent Africa has the highest values of both Inequality in income
(2010) and Inequality in income (2020).

➢ Inequality in income (2010) is most unusual when Continent is Africa and Oceania.

➢ Inequality in income (2010) ranges from 132.7, when Continent is Oceania, to over a
thousand, when Continent is Africa.

HEMISPHERE TO UNDP DEVELOPING REGIONS:

➢ Hemisphere Northern Hemisphere has the highest Inequality in income (2020) at 2,640, out of which UNDP Developing Regions SSA contributed the most at 608.8.

➢ UNDP Developing Regions SSA Inequality in income (2020) from Hemisphere Northern Hemisphere is 608.8, whereas LAC is only 554.9.

➢ UNDP Developing Regions SSA has the highest total Inequality in income (2020) due to Hemisphere Northern Hemisphere.

UNDP DEVELOPING REGIONS:

➢ Continent Africa and America have the lowest UNDP Developing Regions at 2.0.

➢ Continent Asia has the highest UNDP Developing Regions at 5.0, followed by Africa at 2.0.

DASHBOARD 3:
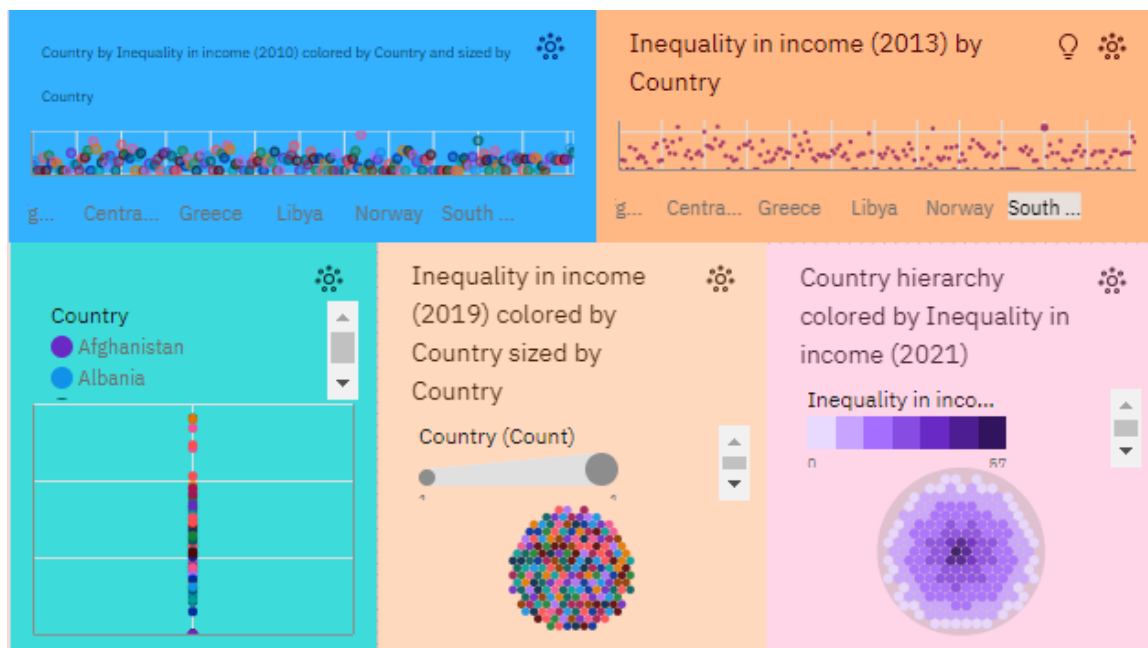
COUNTRY BY INEQUALITY IN INCOME(2010):

➢ The summed values of Inequality in income (2010) range from 0 to 68.34.

➢ For Inequality in income (2010), the most significant value of Country is Namibia, whose respective Inequality in income (2010) values add up to 68.34, or 2.1 % of the total.

➢ Across all countries and countries, the sum of Inequality in income (2010) is over three thousand.
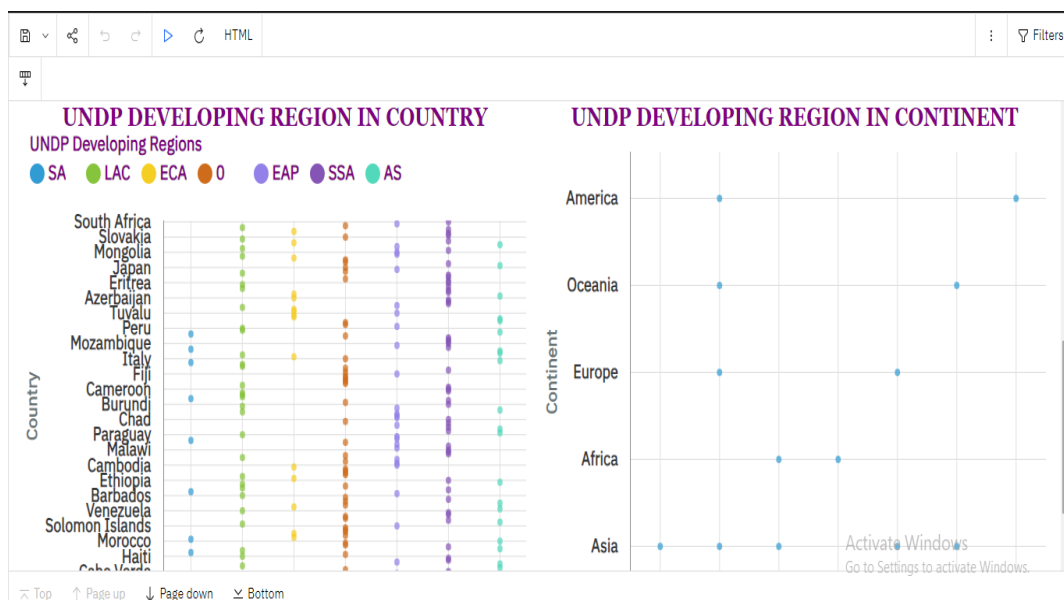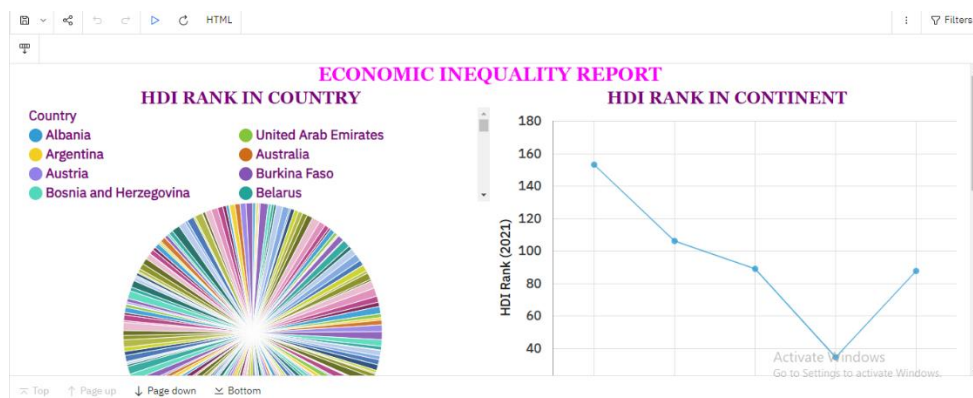
INEQUALITY INCOME (2013) BY COUNTRY:

➢ Continent Africa has the highest Inequality in income (2013) at 1,365, out of which Country Comoros contributed the most at 56.01.

➢ Country Comoros Inequality in income (2013) from Continent Africa is 56.01, whereas Botswana is only 55.51.

➢ Country Comoros has the highest total Inequality in income (2013) due to Continent Africa.

➢ Country Comoros has the highest total Inequality in income (2013) due to Continent Africa.

➢ For Inequality in income (2013), the most significant values of Country are Comoros, Botswana, South Africa, and Namibia, whose respective Inequality in income (2013) values add up to 219.8, or 6 % of the total.

➢ Across all countries, the sum of Inequality in income (2013) is over 3500.

COUNTRY:

➢ Continent Africa has the highest Inequality in income (2015) at 1,340, out of which Country South Africa contributed the most at 56.12.

➢ Continent Africa has the highest Inequality in income (2015) at 1,340, out of which Country South Africa contributed the most at 56.12.

➢ Country South Africa has the highest total Inequality in income (2015) due to Continent Africa.

➢ Inequality in income (2015) ranges from 0, in Afghanistan, to 56.12, in South Africa.

➢ For Inequality in income (2015), the most significant values of Country are South Africa, Comoros, Namibia, Central African Republic, and Zambia, whose respective Inequality in income (2015) values add up to 263.5, or 7.4 % of the total.

- Across all countries, the sum of Inequality in income (2015) is over 3500.
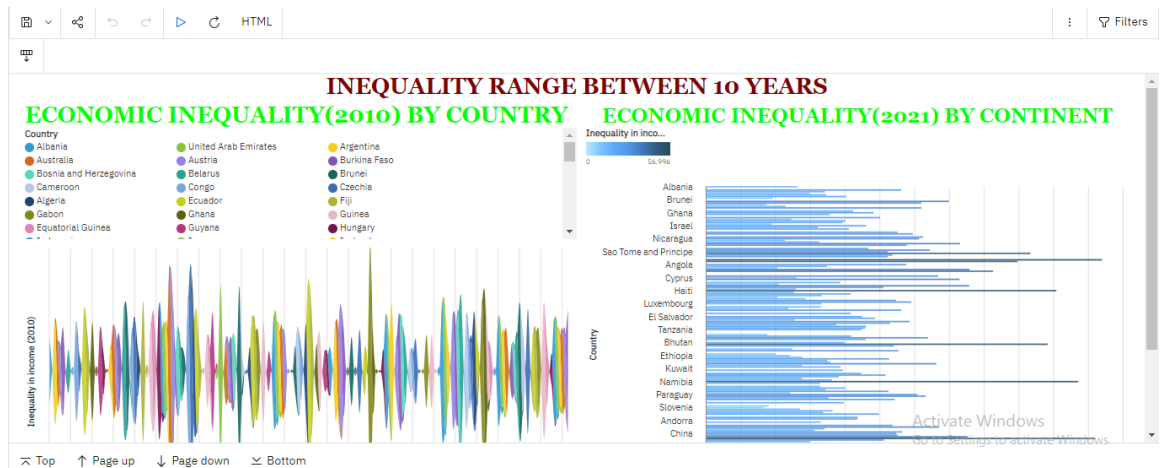- Continent Oceania has the lowest total Inequality in income (2019) at 146.14, followed by Europe at 576.89.

REPORTS:

INEQUALITY RANGE BETWEEN 10 YEARS

ECONOMIC INEQUALITY(2010) BY COUNTRY   ECONOMIC INEQUALITY(2021) BY CONTINENT

Hemisphere	Continent	Inequality in income (2010)	Inequality in income (2020)	UNDP Developing Regions	Human Development Groups	Country
Northern Hemisphere	Africa	0	0	AS	High	Libya
				SSA	Low	Eritrea
					Medium	Equatorial Guinea
			11.5052	AS	High	Algeria
			16.56372	SSA	Low	Mali
			16.88955	AS	High	Tunisia
			17.83777	SSA	Low	Guinea
			24.35	AS		Somalia
			24.94038796	SSA	Low	Uganda
			26.209	SSA	Medium	Sao Tome and Principe
			34.98911	SSA	Medium	Cameroon
			36.503	AS	High	Egypt
		9.05791	12.07582	SSA	Low	Ethiopia
		17.69402	19.85569	SSA	Low	Sierra Leone
		19.004	19.74577	SSA	Low	Liberia

REPORT LINK:

https://us1.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2Feconomic%2Binequality%2Breport&action=edit

REPORT DRIVE LINK:

https://drive.google.com/drive/folders/1YNSX-t3impHOwpNM_meP2-9jbK_A_chL?usp=drive_link

STORY:

LINK:

HTTPS://US1.CA.ANALYTICS.IBM.COM/BI/?PERSPECTIVE=STORY&PATHREF=.MY_FOLDERS%2FNEW%2BSTORY&ACTION=VIEW&MODE=DASHBOARD
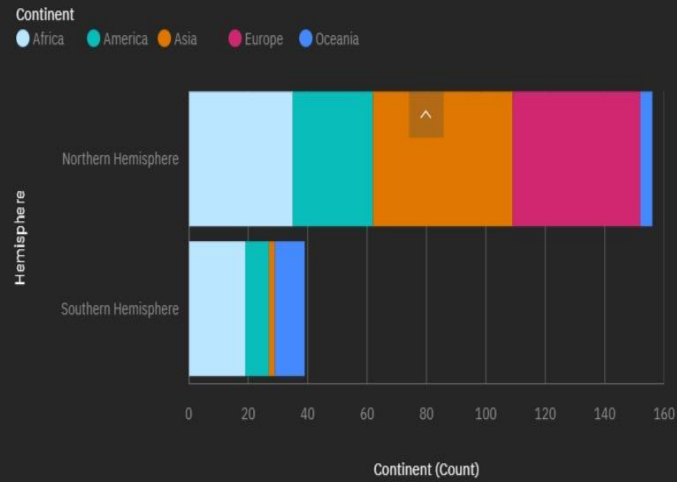
STORY SCREENSHOT:

HEMISPHERE BASED ON CONTINENT

Continent by Hemisphere colored by Continent

- Africa (27.7 %), Asia (25.1 %), Europe (22.1 %), and America (17.9 %) are the most frequently occurring categories of Continent with a combined count of 181 items with Continent values (92.8 % of the total).
- Add insight to favorites
- Northern Hemisphere is the most frequently occurring category of Hemisphere with a count of 156 items with Continent values (80 % of the total).
- Add insight to favorites
- The total number of results for Continent, across all Hemisphere, is 195.
- Add insight to favorites

Continent: Africa, America, Asia, Europe, Oceania

ISRO BY HEMISPHERE

ISO3 by Hemisphere colored by Continent

- Hemisphere Northern Hemisphere has the highest ISO3 due to Continent Asia.
- Add insight to favorites
- Continent Africa has the highest values of both ISO3 and Inequality in income (2020).
- Add insight to favorites
- Continent Africa has the highest ISO3 at 54, out of which Hemisphere Northern Hemisphere contributed the most at 35.
- Add insight to favorites
- Northern Hemisphere is the most frequently occurring category of Hemisphere with a count of 156 items with ISO3 values (80 % of the total).
- Add insight to favorites
- The overall number of results for ISO3 is 195.

Continent: Africa, America, Asia, Europe, Oceania
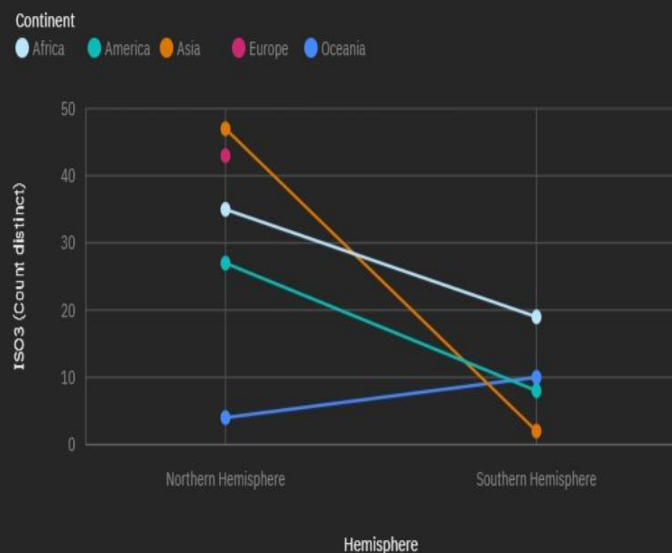
HDI RANK SUMMARY

- **Continent Europe has the lowest average HDI Rank (2021) at 34.64, followed by America at 87.63.**
- **Add insight to favorites**
- **Continent Africa has the highest average HDI Rank (2021) at 153.13, followed by Oceania at 106.23.**
- **Add insight to favorites**
- **The overall number of results for HDI Rank (2021) is 191.**

HDI Rank (2021)

95.81

INEQUALITY BASED ON CONTINENT

- Continent Africa has the highest values of both Inequality in income (2014) and Inequality in income (2020).
- Add insight to favourites
- Inequality in income (2020) and Inequality in income (2014) diverged the most when Continent is Oceania, and when Inequality in income (2020) was 87.78 higher than the Inequality in income (2014).
- Add insight to favorites
- Inequality in income (2014) is most unusual when Continent is Africa and Oceania.

Inequality in income (2014) by Continent

Continent
Oceania   Europe   Asia   America   Africa

623.78
1,404.87
654.71
852.79

HUMAN DEVELOPMENT GROUPS

Human Development Groups and UNDP Developing Regions and Hemisphere for Continent regions

Human Development Groups - UNDP Developing Regions - Hemisphere
- High | ECA | Northern Hemisphere
- High | LAC | Northern Hemisphere
- Medium | LAC | Northern Hemisp...
- High | AS | Northern Hemisphere
- Very High | AS | Northern Hemisp...
- High | O | Northern Hemisphere
- Medium | SSA | Northern Hemisp...
- Medium | EAP | Southern Hemisp...

- **Hemisphere Northern Hemisphere has the highest Total Inequality in income (2020) but is ranked #1 in Unaggregated Continent.**
- **Add insight to favorites**
- **Hemisphere Southern Hemisphere has the highest Unaggregated Continent but is ranked #2 in Total Inequality in income (2020).**
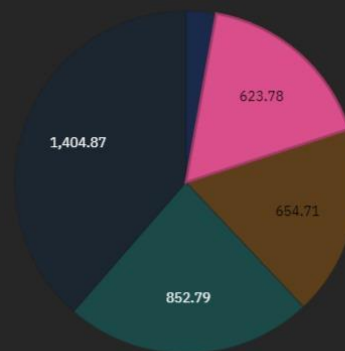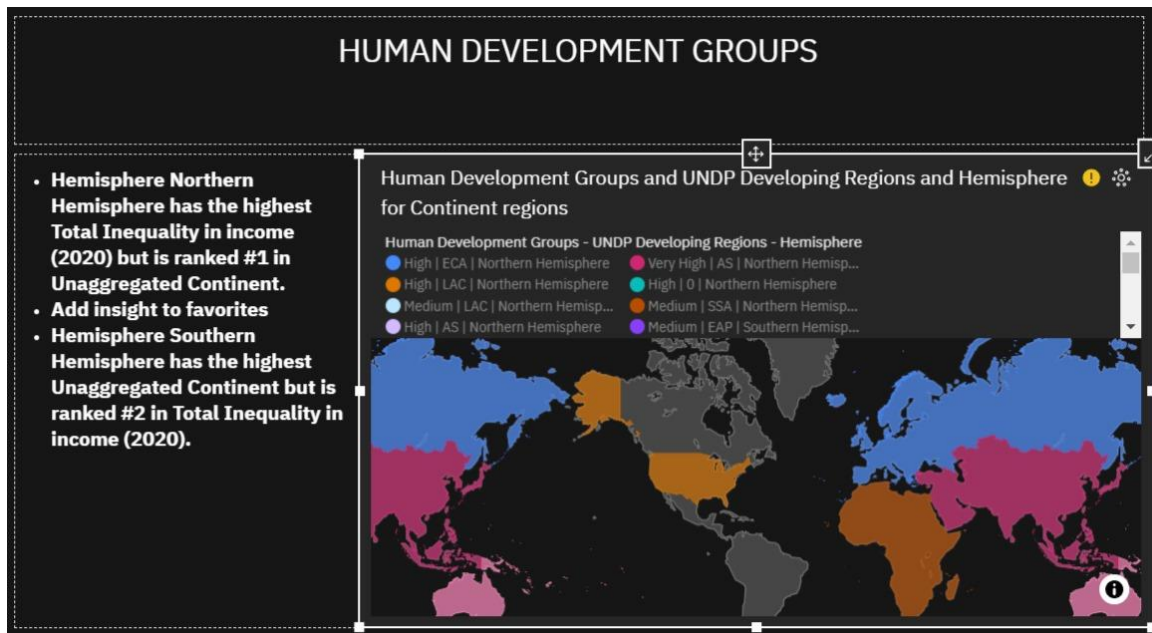
INEQUALITY BASED ON COUNTRY

- Continent Asia has the highest values of both Inequality in income (2011) and Inequality in income (2010)

Inequality in income (2010), Inequality in income (2011), Inequality in income (2012) and Inequality in income (2013) by Country

Measures
- Inequality in income (2010)
- Inequality in income (2011)
- Inequality in income (2012)
- Inequality in income (2013)

DRIVE LINK:

https://drive.google.com/drive/folders/1m5wKJIR7ZyoXAJ-livhajV79bTDh6SRD?usp=sharing

WEBPAGE CREATION:

WEBPAGE CODE :

```html
<!DOCTYPE html>
<html lang="en">


        <head>
 <!-- Basic -->
 <meta charset="UTF-8">
 <meta http-equiv="X-UA-Compatible" content="IE=edge">
 <meta name="viewport" content="width=device-width, initial-scale=1.0">
 <title>Economic Inequality</title>


 <!-- Bootstrap CSS -->
 <link rel="stylesheet"
 href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css"
 >


 <!-- Font Awesome CSS -->
 <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
 awesome/5.15.1/css/all.min.css">


 <!-- Custom CSS -->
```

```html
<link rel="stylesheet" href="css/style.css">


<!-- Google Fonts -->

<link
href="https://fonts.googleapis.com/css2?family=Roboto:wght@400;500;700;90
0&display=swap" rel="stylesheet">


<style>

body {

background-image: url('full-shot-people-coins.jpg'); /* Replace 'your-image.jpg'
with your image URL or path */

background-size: cover;

background-position: center;

background-repeat: no-repeat;

height: 100vh;

color: white; /* Optional: Ensure text is readable against the background */

}


.navbar-brand {

color: white;

}
```

```css
.nav-link {

color: white;

}


.navbar-toggler {

background-color: rgba(255, 255, 255, 0.5); /* Optional: Background color for
the toggler */

}
```

```html
</style>

</head>


<body>


<!-- Header Section -->

<header class="header_section">

<div class="container">

<nav class="navbar navbar-expand-lg custom_nav-container">

<a class="navbar-brand" href="index.html"><span>Economic
Inequality</span></a>

<button class="navbar-toggler" type="button" data-toggle="collapse" data-
target="#navbarSupportedContent"

aria-controls="navbarSupportedContent" aria-expanded="false" aria-
label="Toggle navigation">
```

```html
<span class="navbar-toggler-icon"></span>

</button>


<div class="collapse navbar-collapse" id="navbarSupportedContent">

<ul class="navbar-nav ml-auto">

<li class="nav-item active">

<a class="nav-link" href="index.html">Home <span class="sr-only">(current)</span></a>

</li>

<li class="nav-item">

<a class="nav-link" href="dashboard.html">Dashboard</a>

</li>

<li class="nav-item">

<a class="nav-link" href="report.html">Report</a>

</li>

<li class="nav-item">

<a class="nav-link" href="storytelling.html">Story Telling</a>

</li>

</ul>

</div>

</nav>

</div>
```

</header>

<!-- End Header Section -->

<!-- Optional JavaScript -->

<!-- jQuery first, then Popper.js, then Bootstrap JS -->

<script src="https://code.jquery.com/jquery-3.5.1.slim.min.js"></script>

<script
src="https://cdn.jsdelivr.net/npm/@popperjs/core@2.5.2/dist/umd/popper.min.js
"></script>

<script
src="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/js/bootstrap.min.js"></s
cript>

</body>

</html>

WEBPAGE LINK:

https://drive.google.com/drive/folders/1m5wKJIR7ZyoXAJ-
livhajV79bTDh6SRD?usp=sharing

WEB PAGE SCREENSHOTS:

DESCRIPTIVE ANALYSIS:

1.Overview of Economic Inequality:

- Economic inequality can be measured through various indicators, including income inequality, wealth inequality, and consumption inequality. The most commonly used measures are:

- Gini Coefficient: A measure of income distribution within a population, ranging from 0 (perfect equality) to 1 (perfect inequality).

- Income Quintiles: Dividing the population into five equal groups based on income to understand the share of total income held by each quintile.

- Poverty Rate: The percentage of the population living below the poverty line.

2. Trends in Economic Inequality:

- Over the past few decades, many countries have experienced increasing economic inequality. Key trends include:

- Rising Top Incomes: The top 1% of income earners have seen significant income growth

- compared to the rest of the population.

- Stagnant Middle and Lower Incomes: Middle and lower-income groups have experienced relatively stagnant income growth.
- Wealth Concentration: Wealth has become increasingly concentrated among the richest individuals.

3. Factors Driving Economic Inequality:

- ❖ Several factors contribute to economic inequality, including

a. Globalization:

- Trade and Investment: Globalization has increased trade and investment flows, benefiting high-skilled workers and capital owners more than low-skilled workers.
- Offshoring and Outsourcing: These practices have led to job losses and wage stagnation for low-skilled workers in developed countries.

b. Technological Change:

- Automation and AI: Technological advancements have displaced many low and middle-skill jobs, leading to wage polarization.
- Skill-Biased Technological Change: High-skilled workers have gained disproportionately from technological progress, increasing the wage gap.

c. Labor Market Institutions

- Unionization Rates: Declining unionization has weakened collective bargaining power, contributing to wage stagnation for low and middle-income workers.
- Minimum Wage Policies: Inadequate minimum wage policies have failed to keep up with inflation, exacerbating income disparities.

d. Education and Skills:

- Educational Attainment: Higher educational attainment is associated with higher income levels. Disparities in access to quality education contribute to economic inequality.
- Skills Mismatch: The mismatch between skills demanded by employers and those possessed by workers can lead to underemployment and lower wages.
- e. Tax and Transfer Policies:

- Progressive Taxation: Progressive tax systems can reduce income inequality by redistributing income from high to low-income groups.
- Social Safety Nets: Robust social safety nets (e.g., unemployment benefits, social security) help reduce poverty and income inequality.

f. Demographic Factors

- Age and Gender: Economic outcomes can vary significantly by age and gender, with women and younger individuals often facing higher levels of economic inequality.
- Race and Ethnicity: Racial and ethnic minorities frequently experience systemic barriers to economic opportunity, leading to higher levels of inequality.
- Impacts of Economic Inequality:
- Economic inequality has far-reaching impacts, including:
- Economic Growth: High levels of inequality can hinder economic growth by reducing consumption and investment.
- Social Mobility: Inequality can limit social mobility, making it difficult for individuals from low-income backgrounds to improve their economic status.
- Social Cohesion: High inequality can lead to social unrest and decreased trust in institutions.

5. Policy Recommendations:

- To address economic inequality, a combination of policies is required:
- Invest in Education and Training: Enhance access to quality education and vocational training to improve skills and employability.
- Strengthen Labor Market Institutions: Support unionization and enforce fair labor practices to improve wage growth for low and middle-income workers.
- Implement Progressive Tax Policies: Increase tax rates on high incomes and capital gains to fund social programs and reduce inequality.
- Enhance Social Safety Nets: Expand social safety nets to provide adequate support for vulnerable populations.
- Promote Inclusive Economic Growth: Implement policies that promote inclusive growth, such as infrastructure investments and small business support.

PREDICTIVE ANALYSIS:

- Data Collection: Gather relevant data on economic indicators, demographics, education, employment, income, wealth distribution, and other relevant variables.

- Data Preprocessing: Clean and preprocess the data to handle missing values, normalize data, and perform feature engineering to create meaningful variables.

- Exploratory Data Analysis (EDA): Analyze the data to uncover patterns, trends, and relationships between different variables. Use visualizations such as histograms, scatter plots, and correlation matrices.

- Feature Selection: Identify the most relevant features that contribute to economic inequality. Techniques like correlation analysis, mutual information, and principal component analysis (PCA) can be helpful.

- Model Selection: Choose appropriate machine learning models for predictive analysis. Common models include linear regression, decision trees, random forests, gradient boosting machines, and neural networks.

- Model Training: Train the selected models using historical data. Split the data into training and testing sets to evaluate the performance of the models.

- Model Evaluation: Assess the performance of the models using metrics such as Mean Absolute Error (MAE), Mean Squared Error (MSE), R-squared, and others. Perform cross-validation to ensure the robustness of the models.

- Interpretation: Analyze the model results to understand the factors driving economic inequality. Use techniques like SHAP (Shapley Additive explanations) values to interpret the impact of each feature.

- Forecasting: Use the trained models to make predictions about future trends in economic inequality based on current and projected data.

- Policy Recommendations: Based on the analysis, provide recommendations for policies that could mitigate economic disparities.

ACTION PLAN:

- ✓ **Step 1:** Define Objectives and Scope. Clearly define the research questions. Determine the geographic and temporal scope of the analysis. Specify the dimensions of inequality to be studied.

- ✓ **Step 2**: Literature Review. Summarize key findings from existing literature. Identify gaps in current research. Establish a theoretical framework for the analysis.
- ✓ **Step 3:** Data Collection. List potential data sources and datasets. Ensure access to relevant data through APIs or direct downloads. Document data sources and data collection methods.
- ✓ **Step 4:** Data Preprocessing. Perform data cleaning (handling missing values, outliers).Normalize or standardize data if necessary. Conduct EDA using summary statistics and visualizations (histograms, box plots).
- ✓ **Step 5:** Measure Economic Inequality. Calculate the Gini coefficient and other metrics using appropriate formulas. Create Lorenz curves to visualize income or wealth distribution. Compare inequality metrics across different regions or demographics.
- ✓ **Step 6:** Identify Factors Driving Inequality. Perform correlation analysis (Pearson, Spearman) to identify significant relationships. Conduct multiple regression analysis to quantify the impact of different factors. Use machine learning models to identify and rank predictors.
- ✓ **Step 7:** Segmentation and Clustering. Segment data by key demographics (age, gender, education). Apply clustering algorithms to identify natural groupings within the data. Analyze characteristics of different clusters to gain insights.
- ✓ **Step 8:** Policy Analysis and Recommendations. Review existing policies aimed at reducing inequality. Analyze the effectiveness of these policies using data. Propose new policies based on findings and best practices.
- ✓ **Step 9:** Reporting and Visualization. Create detailed reports with key findings, methodologies, and recommendations. Develop interactive dashboards using tools like Tableau or Power BI. Use data visualization libraries (Matplotlib, Seaborn) for clear and impactful visualizations.

Step 10: Review and Iterate. Conduct peer reviews of the analysis. Incorporate feedback and refine the analysis. Update the analysis periodically with new data and insights.

CONCLUSION:

Income Disparities:

- Income inequality remains a significant issue, with a widening gap between the highest and lowest earners.
- The top 10% of earners control a disproportionately large share of total income, while the bottom 50% have seen stagnating or declining real wages over time.

Wealth Distribution:

- Wealth inequality is even more pronounced than income inequality. The wealthiest 1% hold more wealth than the bottom 90% combined.
- This concentration of wealth limits social mobility and perpetuates economic disparities across generations.

Education and Skill Levels:

- Educational attainment and skill levels are strongly correlated with income levels. Higher education and specialized skills typically result in better-paying jobs.
- Disparities in access to quality education and training programs contribute to persistent income gaps.

Labor Market Dynamics:

- Technological advancements and globalization have shifted labor market dynamics, often benefiting those with high-demand skills while displacing low-skilled workers.
- Job polarization, where middle-skill jobs decline and both high- and low-skill jobs grow, exacerbates economic inequality.

Geographic Inequality:

- Economic opportunities are unevenly distributed across regions, with urban areas often providing more high-paying jobs compared to rural areas.
- Migration patterns and urbanization trends impact regional economic disparities.

Policy Impact:

- Government policies, including tax structures, social safety nets, and labor market regulations, play a crucial role in shaping economic inequality.

- Progressive taxation and robust social programs can mitigate income disparities, while regressive policies may exacerbate them.

Factors Driving Disparities:

Technological Change:

- Automation and digitalization disproportionately benefit high-skill workers, leading to job displacement and wage polarization for low-skill workers.
- The digital divide further exacerbates inequalities in access to technology and digital literacy.

Globalization:

- Trade liberalization and offshoring have increased competition, often leading to job losses in certain industries and regions while benefiting others.
- Global economic integration has contributed to income divergence between highly skilled professionals and low-skilled labor.

Educational Inequality:

- Unequal access to quality education from early childhood through higher education creates significant barriers to social mobility.
- Variations in educational funding, resources, and support systems lead to disparities in academic and economic outcomes.

Labor Market Institutions:

- Decline in union membership and collective bargaining power has weakened wage growth and job security for many workers.
- Labor market deregulation and gig economy trends have led to more precarious employment conditions.

Policy and Governance:

- Tax policies and government spending priorities significantly influence wealth distribution. Regressive tax systems and cuts to social programs disproportionately affect low-income households.
- Political and economic power concentration among the wealthy can skew policies in their favor, perpetuating inequality.