SMARTBRIDGE EXTERNSHIP

TITLE - SUICIDES IN WORLD VISUALIZATIONS USING TABLEAU

Project Report
Topic : Data Analytics

Team Members

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1 INTRODUCTION

1.1 Overview:

This project focuses on analyzing and visualizing suicide rates worldwide using a comprehensive dataset. The dataset includes information on various factors such as country, gender, GDP per country, HDI per year, population, and the number of suicides per 100k population.

The main objective of the project is to gain insights into the patterns, trends, and underlying factors associated with suicidal behavior globally. By exploring the dataset, the project aims to identify global suicide trends, investigate the impact of socioeconomic factors on suicide rates, analyze gender differences, highlight high-risk regions, understand population dynamics, and visualize temporal patterns.

Through data visualization techniques using Tableau, the project will create interactive and informative visualizations. These visualizations may include world maps depicting suicide rates per country, bar charts comparing suicide rates by gender, time series line charts showing the trend of suicide rates over the years, and scatter plots exploring the relationship between GDP per country and suicide rates.

By achieving the objectives of the project, it aims to contribute to the collective understanding of suicide as a global public health issue. The insights gained from the analysis will provide valuable information for policymakers, researchers, and mental health professionals to inform suicide prevention strategies and initiatives. Additionally, the project aims to foster discussions around the topic of suicide and raise awareness about the factors contributing to suicidal behavior.

It is important to approach the topic of suicide rates with sensitivity and responsible communication. The project will provide appropriate context, disclaimers, and resources for support to ensure ethical handling of the data and promote responsible dissemination of the findings.

1.2 Purpose:

The potential purposes of the project include:

1) Understanding Global Suicide Trends: Researchers may analyse the data to identify trends and patterns in suicide rates across different countries and regions over the past few decades. Factors Influencing Suicide Rates: The dataset contains demographic variables such as age, gender, GDP, and population. Researchers might investigate the relationship between these factors and suicide rates to understand potential risk factors or protective factors.

2) Comparing Suicide Rates Between Countries: The dataset includes information from multiple countries. Researchers might use this data to compare suicide rates between different nations and explore potential variations or similarities.

3) Time Series Analysis: Since the dataset spans from 1985 to 2016, researchers may conduct time series analysis to identify trends and changes in suicide rates over time.

4) Modelling and Predictions: Data scientists may build predictive models to forecast future suicide rates based on historical data and demographic indicators.

5) Awareness and Advocacy: Some projects might aim to raise awareness about mental health and suicide prevention through data visualisation and storytelling. It's essential to approach the analysis and interpretation of this sensitive data with ethical considerations and sensitivity, given the gravity of the topic. Suicide is a complex issue influenced by multiple factors, and any research using this dataset should prioritise ethical practises and a responsible approach to handling the findings.

2 THEORETICAL ANALYSIS

Hardware Requirements:

1. Host Machine: A Windows PC with sufficient processing power, memory, and storage to accommodate the virtualization software and virtual machines.

2. Network Interface: A network interface (Ethernet or Wi-Fi) to connect the host machine to the network and facilitate communication between virtual machines and external systems.

Software Requirements:

1.Tableau: Creating worksheets, dashboards and stories using tableau by different types of charts.

2.VS code: VS Code provides a powerful code editor with features like syntax highlighting, auto-completion, code formatting, and intelligent code suggestions. These features make it easier and more efficient to write and edit code. The code for the Flask application (app.py) and the HTML file (proj.html) could have been written and edited in VS Code.

3 EXPERIMENTAL INVESTIGATIONS

The project is completed using a provided dataset and its implementation in 'Tableau'. Through this, we depicted the trends and analysed the suicide deaths by different attributes. Later on, the results are deployed in a flask application, and a bootstrap template is created.

1. Understanding the Dataset: The first step of the task is to identify the variables present in the dataset and their significance. The variables of the "Suicide Rates Overview 1985–2016" dataset are:

Country: The name of the country
Year: The year of the recorded data
Sex: The gender category (male or female).
Age: The age group category
Suicides_no: The number of suicides reported
Population: The total population in the given category
GDP_year: The gross domestic product (GDP) in the given year.
GDP_capita: The per capita GDP in the given year.
Generation: The generational cohort category (e.g., Generation X, Baby Boomers)

2. Understanding Tableau: Tableau is an end-to-end data analytics platform that allows you to prep, analyse, collaborate, and share your big data insights. We use Tableau Public to create visualisations.

3. Dashboards and Stories: Using tableau, we create worksheets to ensure the relationship between the different variables of the dataset. With the different worksheets together, we create dashboards, and finally, we write the story, which is simply the argument that can be made by looking at the dashboard created.

4. Creating a Bootstrap Template: In the code, the Bootstrap CSS and JavaScript files are included in the HTML file using the CDN links.

These CSS and JavaScript files are responsible for the responsive layout, styling, and interactive behaviour of the web page.

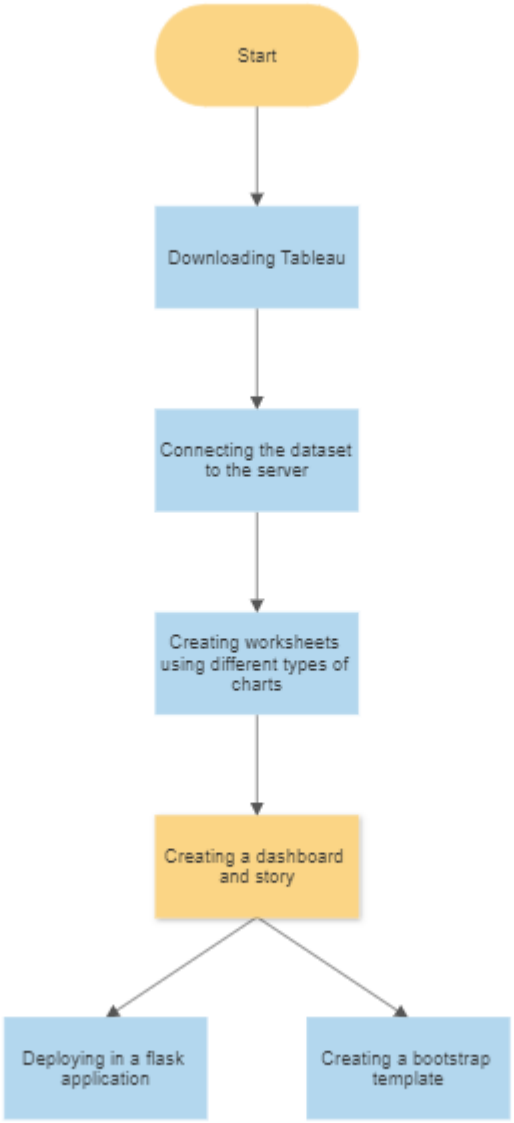
The code structure and class names in the HTML file follow the Bootstrap framework's conventions to leverage its styling and layout capabilities.

5. Deploying in Flask: Flask is a web framework for Python that allows you to build web applications. In the code, Flask is used to create a web server and handle HTTP requests and responses. It provides a simple and efficient way to serve the HTML file and other static assets.

In the app.py file, Flask is imported and initialised with the code. The render_template function from Flask is used to render the proj.html file and serve it to the client.

The main route is defined with the @app.route('/') decorator, which specifies that when a user accesses the root URL of the web application, the proj.html file should be rendered

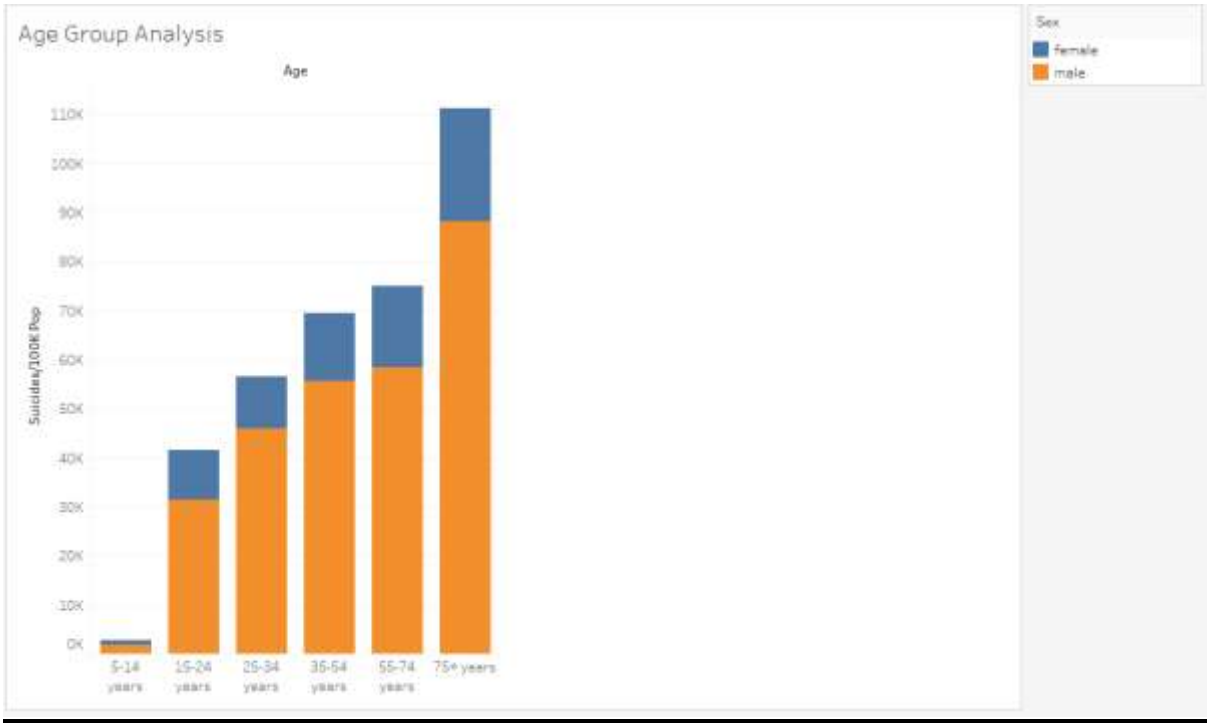
4 FLOWCHART

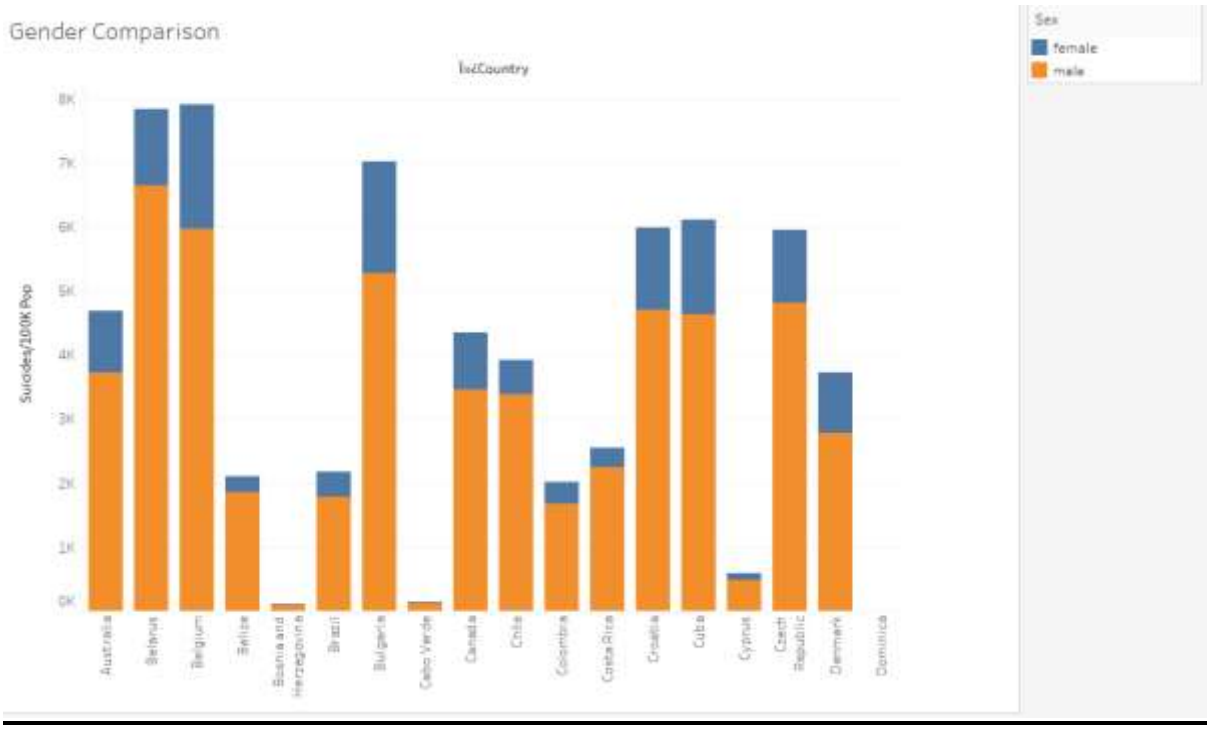

Start
Downloading Tableau
Connecting the dataset to the server
Creating worksheets using different types of charts
Creating a dashboard and story
Deploying in a flask application
Creating a bootstrap template

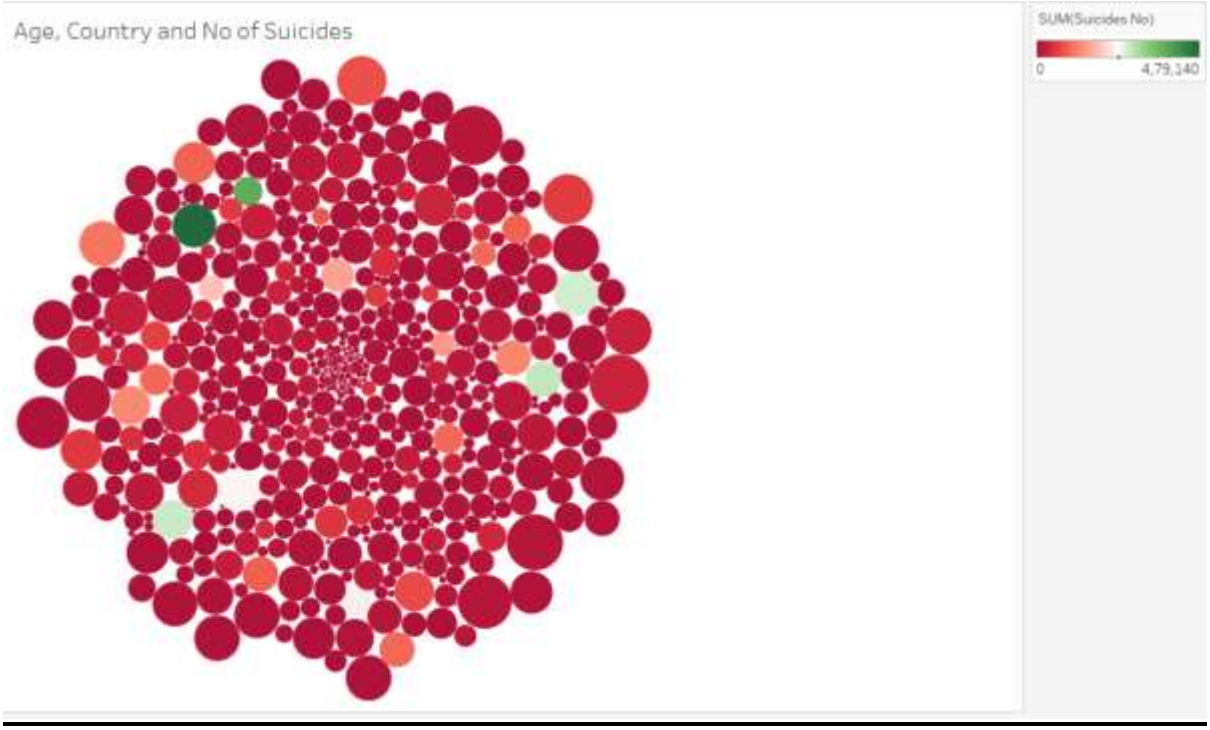
5 RESULT

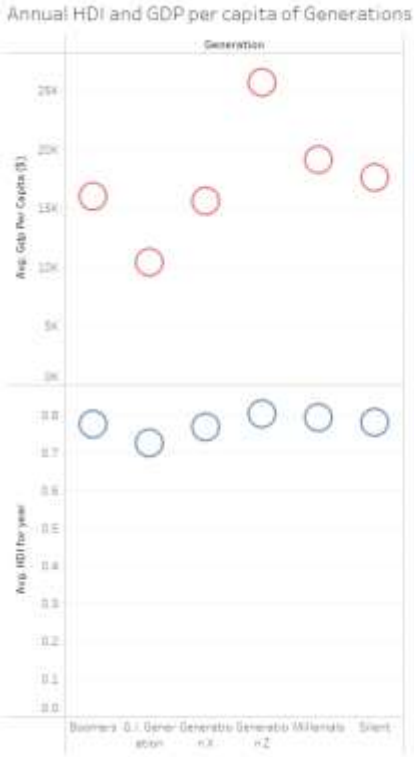
The result is interpreted in the form of different worksheets which are used to analyse the factors contributing to suicide death rates.

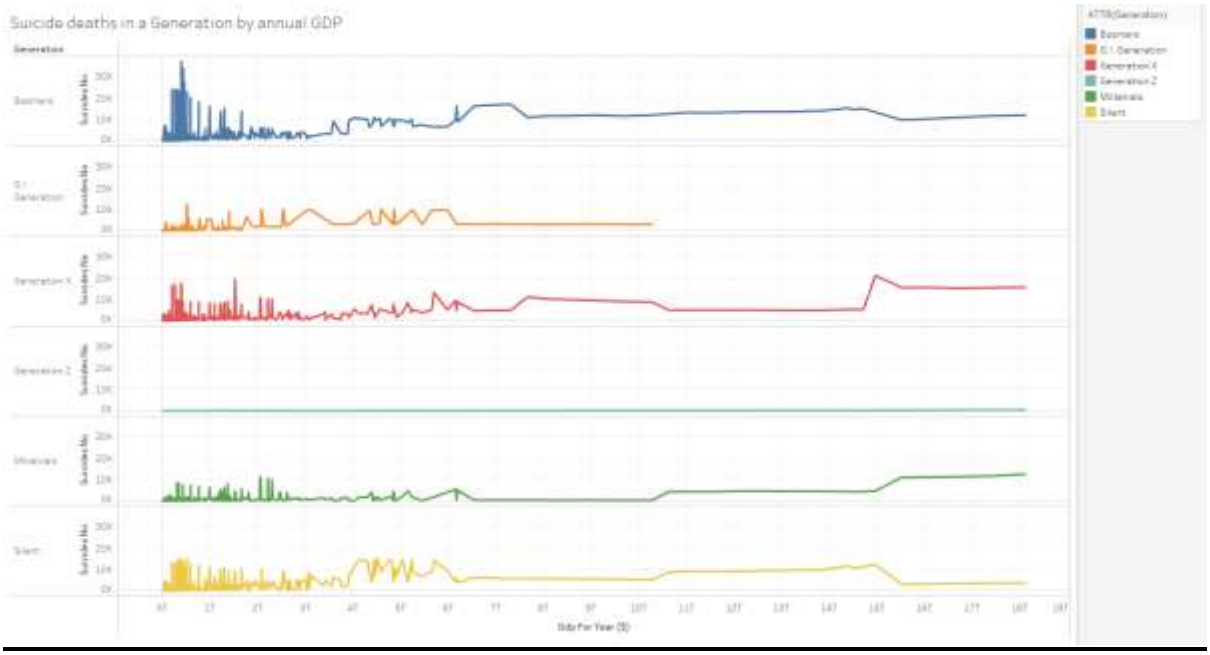
Worksheets Created:

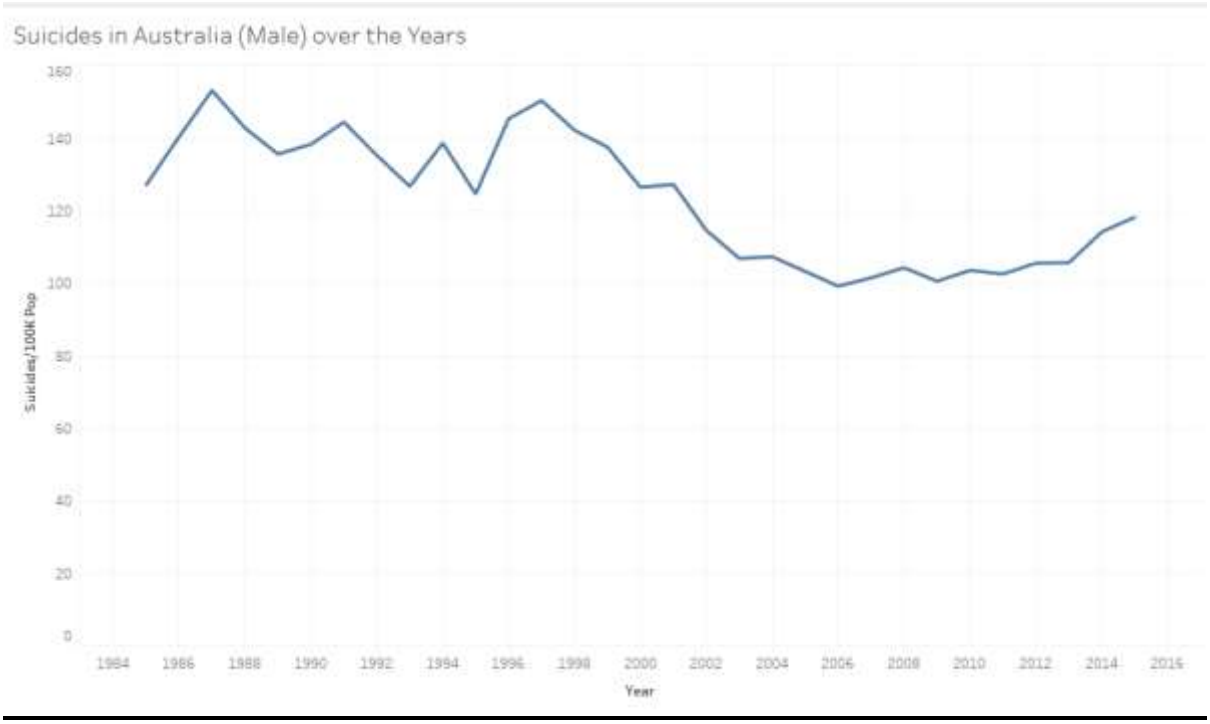


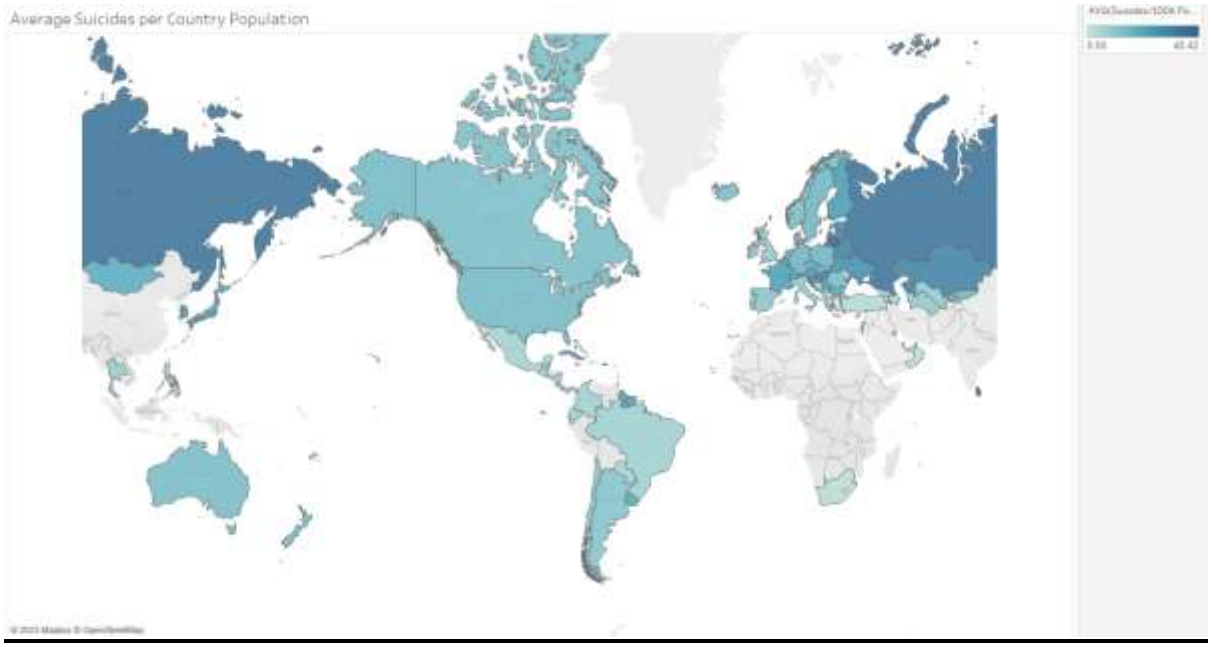



Age, Country and No of Suicides
SUM(Suicides No)
0
4,79,140


Annual HDI and GDP per capita of Generations
Generation
Avg. Gdp Per Capita ($)
Avg. HDI for year
Boomers
G.I. Generation
Generation X
Generation Z
Millennials
Silent


Suicide deaths in a Generation by annual GDP


Suicides in Australia (Male) over the Years
Suicides/100K Pop
160
140
120
100
80
60
40
20
0
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
Year



6 ADVANTAGES & DISADVANTAGES

Advantages:

1. Visualisation and Interpretation: The use of a device like Tableau to create visualisations allows for a more intuitive and comprehensive expertise of the records. visible representations can assist identify patterns, tendencies, and correlations that may not be straight away apparent in raw information. This can facilitate less difficult interpretation and verbal exchange of insights to stakeholders.

2. Insightful evaluation: The proposed solution entails engaging in diverse analyses and investigations, which includes temporal trends, geographical patterns, gender-based totally or age-based totally analysis, and correlation evaluation. those analyses can offer valuable insights into the elements influencing suicide fees, helping to perceive ability chance factors, goal interventions, or guide policy decisions.

3. Statistics-pushed Storytelling: Through combining the visualisations and insights derived from the analysis, you could create a records-pushed story or report. This storytelling method enables you to efficiently communicate complicated information and interact with stakeholders, increasing their know-how and cognizance of the difficulty.

4. Identification of Outliers and Anomalies: The analysis may additionally involve detecting outliers or anomalies inside the dataset. figuring out such cases can offer precious insights into unique conditions or occasions which can have appreciably inspired suicide

quotes in precise nations or years. These records can manual further investigation or help allocate sources accurately.

Disadvantages:

1. Facts Availability and Fine: The effectiveness of the proposed answer closely is predicated on the availability and pleasantness of the dataset. If the dataset is incomplete, contains lacking values, or has records satisfactory troubles, it can impact the accuracy and reliability of the evaluation and next insights.

2. Confounding elements: even as the analysis can screen correlations and institutions, it is able to no longer set up causal relationships. Suicide prices are stimulated by way of various complicated elements, along with cultural, socioeconomic, and mental aspects. It's important to don't forget capacity confounding variables that could have an effect on the located relationships.

3. Restricted Scope of Variables: The proposed evaluation is based on the variables supplied inside the dataset, consisting of the United states, year, intercourse, age, GDP, and populace. even as these variables offer precious insights, there may be other elements, such as intellectual fitness rules, social support structures, or cultural norms, that aren't blanketed within the dataset however could substantially impact suicide prices. The absence of such variables can restrict the depth of the analysis.

4. Ethical issues: Suicide is a sensitive and enormously non-public subject matter. It's far more important to address the information and evaluation with sensitivity and empathy. Respecting privacy and maintaining confidentiality when working with individual-level facts is important. It's also critical to present the findings responsibly, thinking about ability implications and averting stigmatisation.

5. Validity of Forecasts: If time collection forecasting models are used, the accuracy and validity of the forecasts depend upon the excellence of ancient data and assumptions made during modelling. Outside factors, including socio-political activities or coverage adjustments, may notably impact destiny suicide rates, and these elements may not be captured within the ancient facts.

It's far more important to be privy to those advantages and disadvantages whilst enforcing the proposed answer and to significantly interpret the findings in light of those limitations.

7 APPLICATIONS

1. Public health and intellectual fitness coverage: The analysis can offer insights into the factors influencing suicide costs, assisting policymakers perceive high-hazard populations, target interventions, and expand effective mental fitness regulations. it is able to inform techniques for suicide prevention, intellectual fitness promotion, and the allocation of assets to deal with the problem.

2. Social work and Counselling: The evaluation can help social workers, counselors, and mental health professionals in information the traits and styles in suicide charges. It may be a useful resource in identifying prone companies, informing prevention and intervention strategies, and growing tailor-made support services for individuals at risk.

3. Studies and Academia: The proposed answer can be utilized in educational studies to discover the complicated relationships between socio-demographic factors, financial signs, and suicide quotes. it may make a contribution to the present body of expertise on suicide prevention, mental health, and the effect of societal elements on well-being.

4. Non-earnings corporations and Advocacy agencies: Non-profit agencies focused on mental fitness and suicide prevention can make use of the analysis to raise attention, aid proof-based interventions, and advocate for coverage changes. The insights received can assist in designing targeted awareness campaigns, academic tasks, and aid programs.

5. Worldwide businesses and worldwide health tasks: The evaluation may be carried out by means of global businesses, along with the arena fitness employer (WHO), to assess worldwide suicide developments, identify areas with higher costs, and guide the development of global intellectual fitness projects. it is able to tell the implementation of suicide prevention packages and interventions in extraordinary international locations.

6. Statistics Journalism: Newshounds and media corporations can utilize the insights derived from the evaluation to document on suicide prices, trends, and capacity contributing elements. this could assist enhance public awareness, lessen stigma, and sell discussions round intellectual fitness and suicide prevention.

7. Company properly-being programs: Groups and employers can enjoy the evaluation to benefit insights into the mental fitness and nicely-being of their staff. it is able to inform the improvement of worker help programs, intellectual health guide initiatives, and place of work policies that foster a supportive and healthy surroundings.

These are just a few examples of the capability regions where the analysis of suicide information can be applied. The insights gained from the evaluation can contribute to knowledgeable decision-making, policy development, useful resource allocation, and the promotion of intellectual fitness and proper-being at numerous tiers, from individuals to communities and societies as an entire**.**

8 CONCLUSION

In conclusion, the proposed solution of analyzing suicide information, the usage of visualizations and investigations gives treasured insights into the complex phenomenon of suicide. By means of leveraging tools like Tableau, we can create intuitive visible representations that facilitate information and interpretation of the facts.

By this solution, we will become aware of temporal tendencies, geographical patterns, gender-based and age-based versions, in addition to correlations between suicide costs and monetary factors. Those insights provide a foundation for evidence-based, choice-making and interventions in regions together with public health, mental fitness policy, social paintings, studies, non-income businesses, and corporate well-being programs.

The proposed answer gives a statistical-pushed approach to understanding suicides and associated factors, enabling stakeholders to advantage insights, expand techniques, and make contributions to suicide prevention efforts. By combining analysis, visualisation and responsible communication we can promote awareness, reduce stigma, and foster dialogue around mental health and well-being.. it is critical to continuously refine and replace the analysis as new data becomes available, making sure that our information of suicide evolves and informs targeted actions to save lives and guide those affected by this global issue.

9 FUTURE SCOPE

These are the enhancements that can be made in the future,

1) We can extend the analysis by adding more data when they become available. This will enable to understand better trends and changes in suicide rates over time with more accuracy.

2) We can add additional variables such as mental health policies, access to healthcare centres, education levels.This will provide a more nuanced understanding of the factors contributing to suicide and enable a deeper analysis of their interactions and effects.

3)Machine learning models can be used to forecast suicide rates based on historical data and relevant predictions. These models can help and alert high-risk populations, facilitating early intervention efforts.

4)Increase the quantitative analysis with qualitative studies techniques with interviews, surveys, or case research, to advantage deeper insights into the lived experiences of people suffering from suicide or intellectual health challenges. Qualitative facts can offer context, personal narratives, and nuanced perspectives that supplement the quantitative findings.

5)Integrate with real-time data such as social media sentiment analysis or emergency helpline data, to enhance the timeliness and accuracy of suicide surveillance and early warning systems.

6)Explore other data sources from psychological assessments, hospital records, or socioeconomic indicators, to gain a more comprehensive understanding of the factors contributing to suicide rates

7)Collaborate with several mental health organizations, research institutions to gain more data and contribute to ongoing efforts in suicide prevention and mental health support.

10 BIBLIOGRAPHY

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- Johnson, L. M. (2018). Suicide Prevention: Strategies and Interventions. Oxford University Press.

- Brown, A. R., & Lee, C. M. (2019). Socioeconomic factors and suicide rates. In S. Patel & R. Jones (Eds.), Mental Health and Well-being: International Perspectives on Socioeconomic Status and Policy (pp. 123-145). Springer.

- World Health Organization. (2020). Preventing Suicide: A Global Imperative. Retrieved from https://www.who.int/mental_health/suicide-prevention/en/

APPENDIX

Bootstrap Code:

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

<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Suicides in world visualizations using tableau</title>
  <link rel="stylesheet"
href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.0/css/bootstrap.min.css">
</head>
```

```
<body>
  <nav class="navbar navbar-dark bg-dark">
    <div class="container">
      <a class="navbar-brand" href="#">Suicides in world visualizations using tableau</a>
    </div>
  </nav>

  <div class="container mt-5">
    <h2>Story 1: Suicide deaths by Age, Country, and Gender</h2>
    <div class='tableauPlaceholder' id='viz1688403903549' style='position: relative'>
      <noscript><a href='#'><img alt='Suicide deaths by Age,Country and Gender '

src='https://public.tableau.com/static/images/Su/SuicidedeathsbyAgeCountryandGender_/Sto
ry1/1_rss.png'
          style='border: none' /></a></noscript>
      <object class='tableauViz' style='display:none;'>
        <param name='host_url' value='https%3A%2F%2Fpublic.tableau.com%2F' />
        <param name='embed_code_version' value='3' />
        <param name='site_root' value='' />
        <param name='name' value='SuicidedeathsbyAgeCountryandGender_/Story1' />
        <param name='tabs' value='no' />
        <param name='toolbar' value='yes' />
        <param name='static_image'

value='https://public.tableau.com/static/images/Su/SuicidedeathsbyAgeCountryandGender_/
Story1/1.png' />
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        <param name='display_static_image' value='yes' />
        <param name='display_spinner' value='yes' />
        <param name='display_overlay' value='yes' />
        <param name='display_count' value='yes' />
        <param name='language' value='en-US' />
        <param name='filter' value='publish=yes' />
      </object>
    </div>
    <script type='text/javascript'>
      var divElement = document.getElementById('viz1688403903549');
      var vizElement = divElement.getElementsByTagName('object')[0];
      vizElement.style.width = '100%';
      vizElement.style.height = (divElement.offsetWidth * 0.75) + 'px';
      var scriptElement = document.createElement('script');
      scriptElement.src = 'https://public.tableau.com/javascripts/api/viz_v1.js';
      vizElement.parentNode.insertBefore(scriptElement, vizElement);
```

```
    </script>

    <h2 class="mt-5">Story 2: Suicide deaths in Generations by GDP and HDI</h2>
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src='https://public.tableau.com/static/images/Su/SuicidedeathsinGenerationsbyGDPandHDI/
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          style='border: none' /></a></noscript>
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        <param name='embed_code_version' value='3' />
        <param name='site_root' value='' />
        <param name='name' value='SuicidedeathsinGenerationsbyGDPandHDI/Story1' />
        <param name='tabs' value='no' />
        <param name='toolbar' value='yes' />
        <param name='static_image'

value='https://public.tableau.com/static/images/Su/SuicidedeathsinGenerationsbyGDPandHD
I/Story1/1.png' />
        <param name='animate_transition' value='yes' />
        <param name='display_static_image' value='yes' />
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    </div>
    <script type='text/javascript'>
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      var vizElement = divElement.getElementsByTagName('object')[0];
      vizElement.style.width = '100%';
      vizElement.style.height = (divElement.offsetWidth * 0.75) + 'px';
      var scriptElement = document.createElement('script');
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      vizElement.parentNode.insertBefore(scriptElement, vizElement);
    </script>

    <h2 class="mt-5">Story 3: Suicide deaths by Country</h2>
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src='https://public.tableau.com/static/images/Su/SuicidedeathsbyCountry/Story1/1_rss.png'
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      <object class='tableauViz' style='display:none;'>
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        <param name='tabs' value='no' />
        <param name='toolbar' value='yes' />
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value='https://public.tableau.com/static/images/Su/SuicidedeathsbyCountry/Story1/1.png' />
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        <param name='language' value='en-US' />
      </object>
    </div>
    <script type='text/javascript'>
      var divElement = document.getElementById('viz1688401138675');
      var vizElement = divElement.getElementsByTagName('object')[0];
      vizElement.style.width = '100%';
      vizElement.style.height = (divElement.offsetWidth * 0.75) + 'px';
      var scriptElement = document.createElement('script');
      scriptElement.src = 'https://public.tableau.com/javascripts/api/viz_v1.js';
      vizElement.parentNode.insertBefore(scriptElement, vizElement);
    </script>
  </div>

  <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/4.5.0/js/bootstrap.min.js"></script>
</body>

</html>
```

Flask deployment:

-app.py

```
from flask import Flask, render_template
```

```
app = Flask(_name_)

@app.route('/')
def index():
    return render_template('proj.html')

if _name_ == '_main_':
    app.run()
```