HEART DISEASE ANALYSIS

Define Problem/Problem Understanding

Define Problem Statement: Visualizing and Predicting Heart Diseases with an Interactive Dashboard

Business Requirements: The health care industry produces a huge amount of data. This data is not always made use to the full extent and is often underutilized. Using this huge amount of data, a disease can be detected, predicted or even cured. The business requirements for analyzing the Heart Disease in world include identifying patterns and comparing factors of heart disease, creating interactive dashboards and reports, identifying areas for improvement, making data-driven decisions, comparing to the current situation and creating forecasting models for future performance. The ultimate goal is to gain insights and improve performance through data visualization techniques.

Literature Survey: A literature study is necessary for a project that uses an interactive dashboard to visualize and forecast heart illness. It covers pertinent studies on data visualization for heart disease, predictive modeling, interactive dashboard design, and user experience in healthcare applications. In order to guide the creation and use of a successful heart disease prediction dashboard, the survey attempts to uncover best practices, predictive models, visualization strategies, and ethical considerations from previous research and initiatives.

Social or Business Impact:

Social Impact: Analyzing heart disease has profound social impacts, ranging from individual-level health outcomes to community empowerment and public health initiatives. By promoting awareness, prevention, equitable healthcare access, and research advancements, heart disease analysis plays a crucial role in improving the well-being of individuals and society as a whole. Business Model/Impact: Analyzing heart disease has substantial business impacts across various sectors, including healthcare, medical technology, pharmaceuticals, digital health, insurance, research, workplace wellness, and consumer products. It creates market opportunities, drives innovation, and influences policy and advocacy efforts in the fight against heart disease.

Data Collection and Extraction from Database

Downloading the Dataset: Heart_new2 dataset is downloaded for making visualizations.

Column Description of the Dataset:

1. Heart Disease - target trait.

2. BMI – A value that allows you to assess the degree of correspondence between a person's mass and his height, and thereby indirectly judge whether the mass is insufficient, normal or excessive. It is important in determining the indications for the need for treatment.

3. Smoking: It is a major risk factor for cardiovascular disease. When smoke from a cigarette is inhaled, the reaction of the cardiovascular system immediately follows: within one minute, the heart rate begins to rise, increasing by 30% within ten minutes of smoking. The bad habit also increases blood pressure, fibrinogen and platelet levels, making blood clots more likely.

4. Alcohol Drinking - alcohol causes not only temporary disturbances in the functioning of the heart, but also permanent ones. Heart pain after alcohol is not the only health problem associated with alcohol consumption.

5. Stroke - Ischemic stroke occurs 4 times more often than hemorrhagic. One of the leading causes of this suffering is heart disease, which impairs its functioning, as a result of which the blood flow in the arteries is disturbed and the blood supply to the brain is reduced. Another cause of stroke in heart disease is thromboembolism, when clots form in the cavities of the heart (most often with heart failure) - blood clots.

6. Physical Health - how many days in a month did you feel poor physical health.

7. Mental Health - how many days in a month did you feel poor mental health.

8. Diff Walking - difficulty climbing stairs.

9. Sex - gender of a person.

10. Age Category - age category of the subjects.

11. Race- Race is a complex social construct that categorizes people into distinct groups based on certain physical and genetic characteristics

12. Diabetic – Person suffering from Diabetes

13. Physical Activity - adults who reported doing physical activity or exercise during the past 30 days other than their regular job

14. Gen Health - well-being.

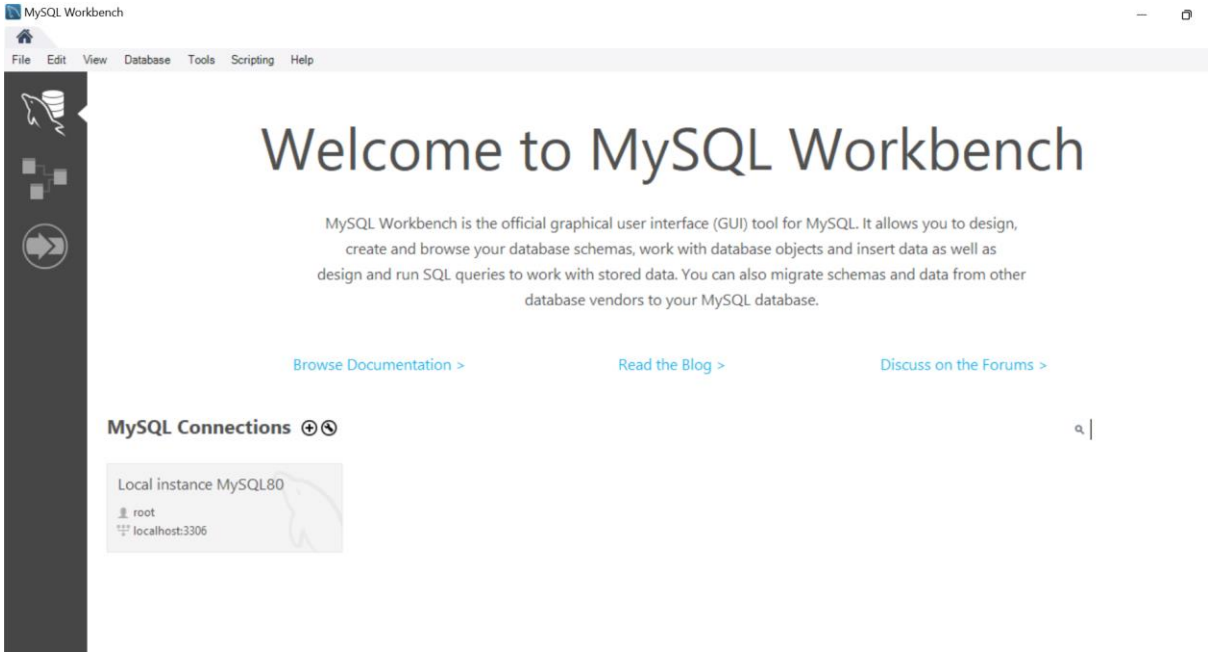
15. Sleep Time - number of hours of sleep.

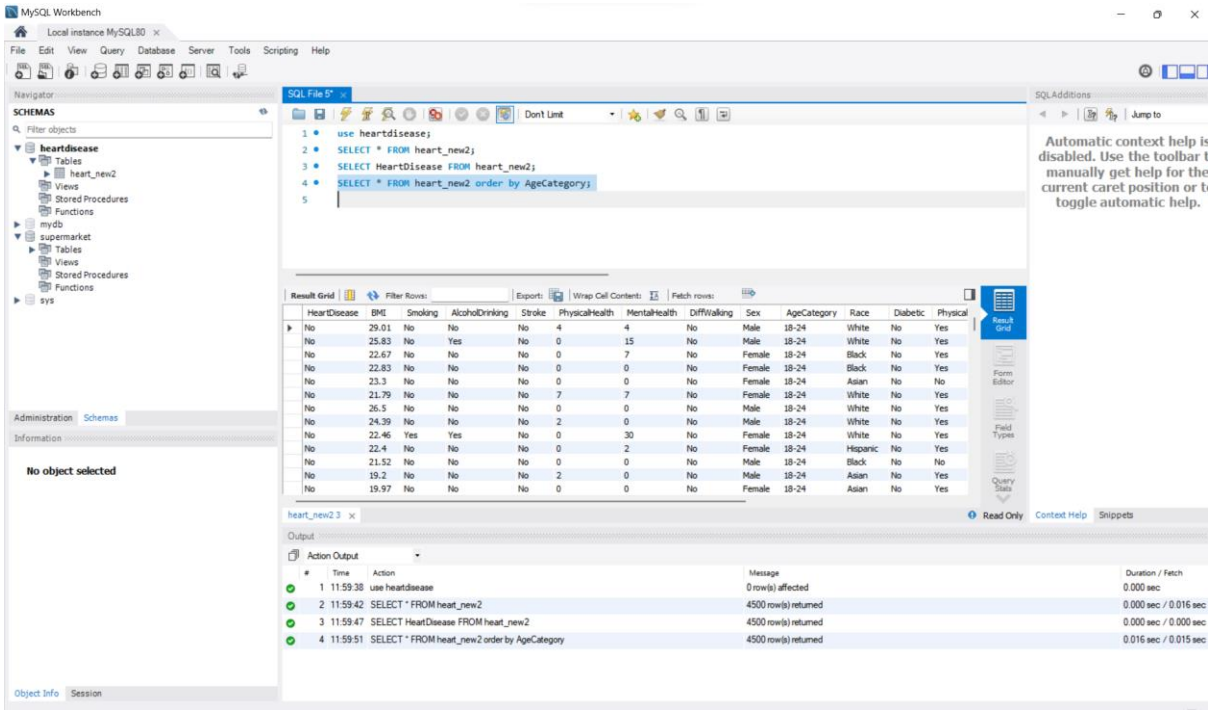
16. Asthma- Asthma is a chronic respiratory condition due to breathing Issue

17. Kidney Disease – Disease related to Kidney

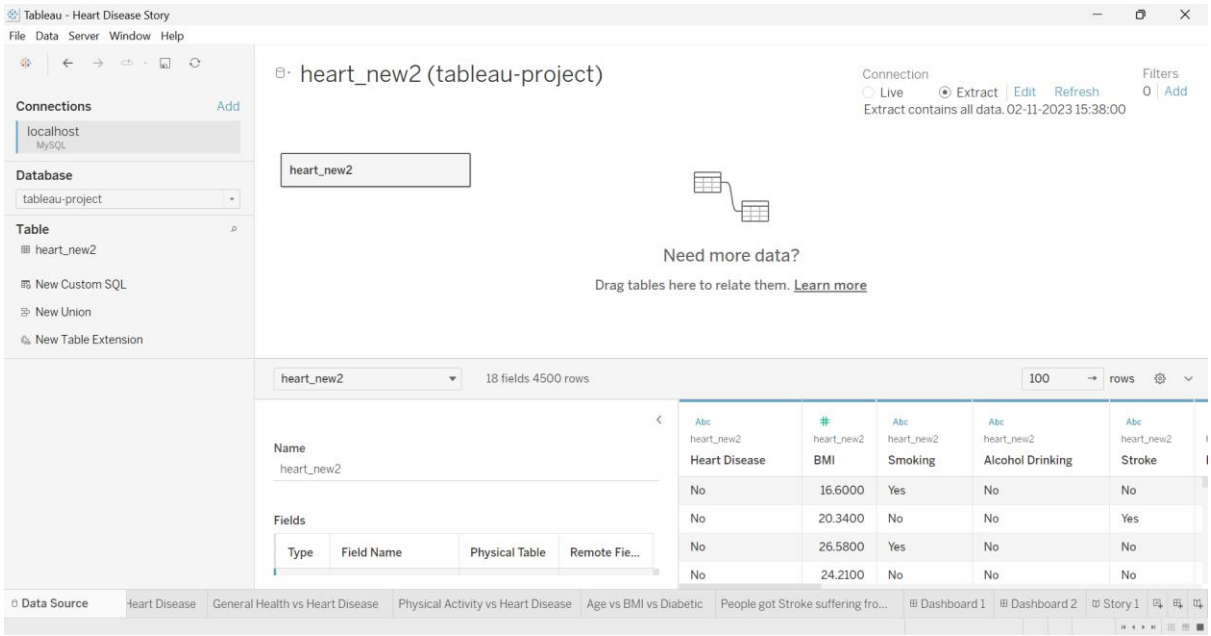
18. Skin Cancer – People suffering from Skin Cancer

Storing Data in DB and Perform SQL Operations:





Connect DB with Tableau:

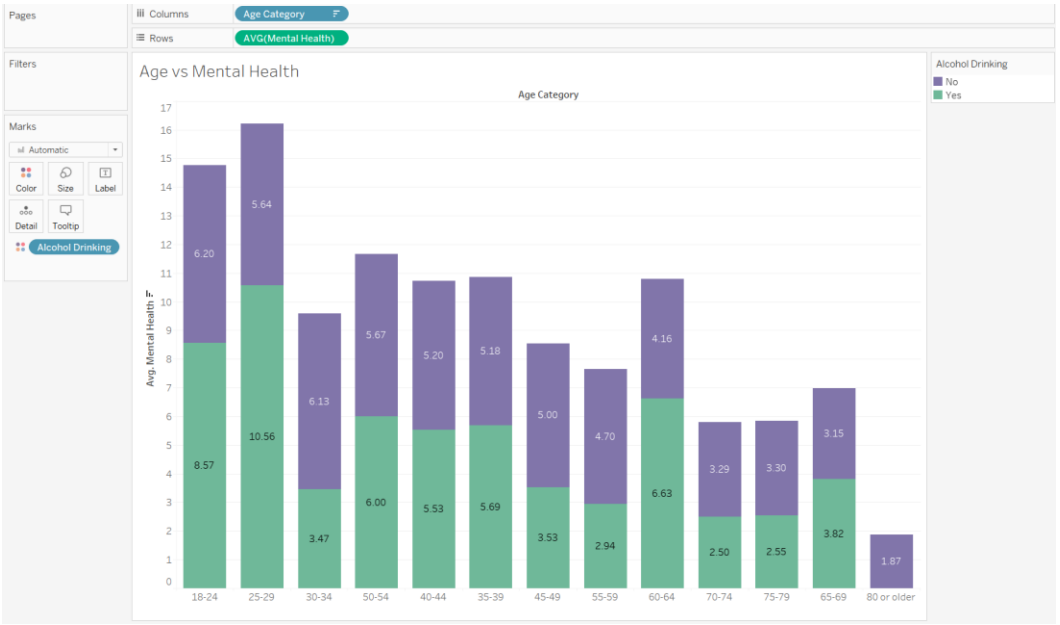


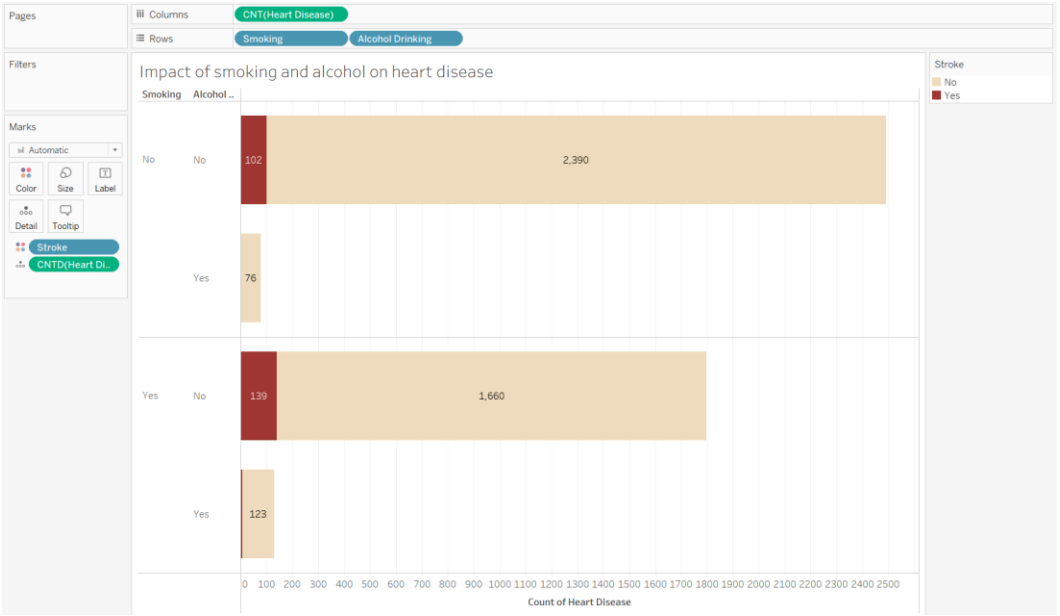
Data Preparation

Prepare the Data for Visualization: Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for creating visualizations to gain insights into the performance and efficiency. Since the data is already cleaned we can move to visualization.

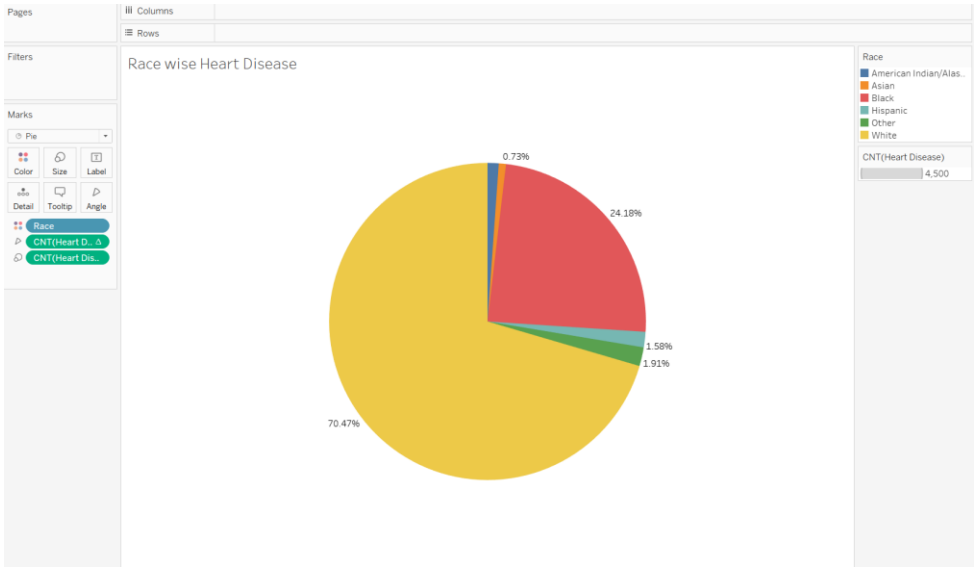
Data Visualization

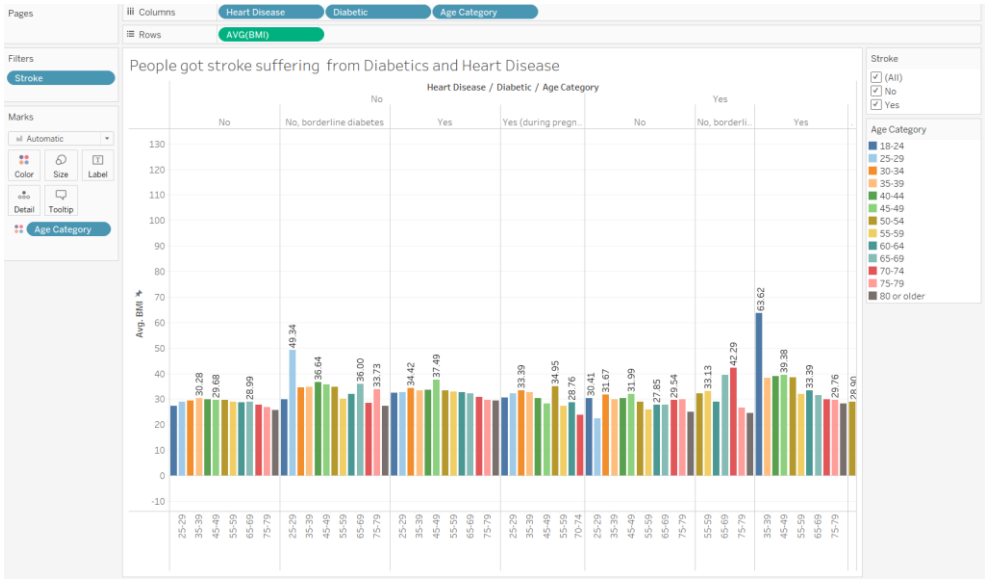
No of Unique Visualizations: There are 10 unique visualizations.

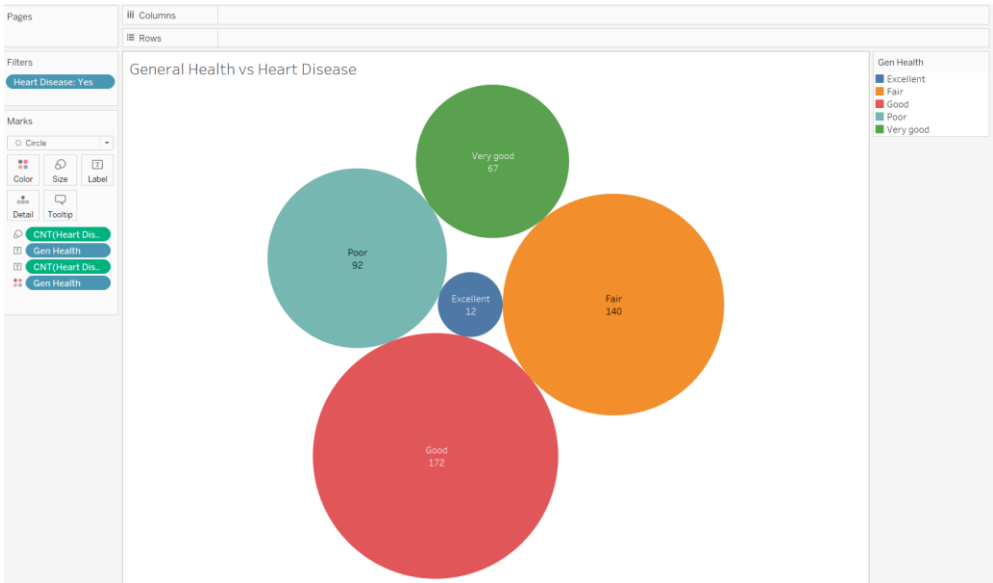

Pages
Columns
Age Category
Rows
AVG(Mental Health)
Filters
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Alcohol Drinking
Age vs Mental Health
Age Category
Avg. Mental Health
Alcohol Drinking
No
Yes
6.20
8.57
5.64
10.56
6.13
3.47
5.67
6.00
5.20
5.53
5.18
5.69
5.00
3.53
4.70
2.94
4.16
6.63
3.29
2.50
3.30
2.55
3.15
3.82
1.87
18-24
25-29
30-34
50-54
40-44
35-39
45-49
55-59
60-64
70-74
75-79
65-69
80 or older


Pages
Columns
CNT(Heart Disease)
Rows
Smoking
Alcohol Drinking
Filters
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Stroke
CNTD(Heart Di..
Impact of smoking and alcohol on heart disease
Smoking
Alcohol ..
Stroke
No
Yes
No
No
102
2,390
Yes
76
Yes
No
139
1,660
Yes
123
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500
Count of Heart Disease

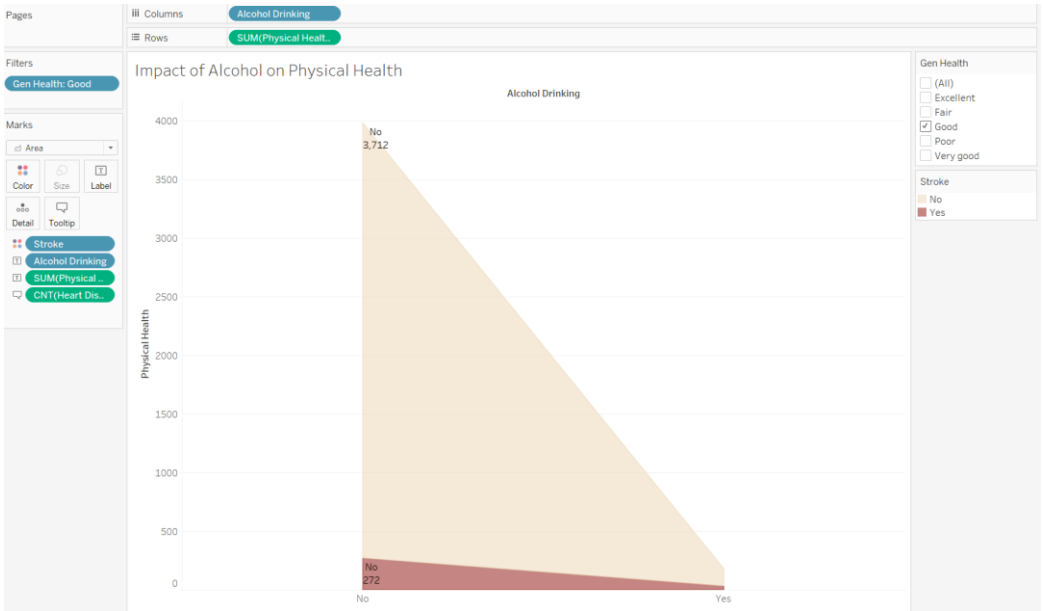

Pages
Columns
SUM(Sleep Time)
Rows
Heart Disease
Filters
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Asthma
sleeptime vs Heart Disease
Heart Dis..
Asthma
No
Yes
No
3,788
24,486
Yes
2,806
0K 2K 4K 6K 8K 10K 12K 14K 16K 18K 20K 22K 24K 26K 28K
Sleep Time

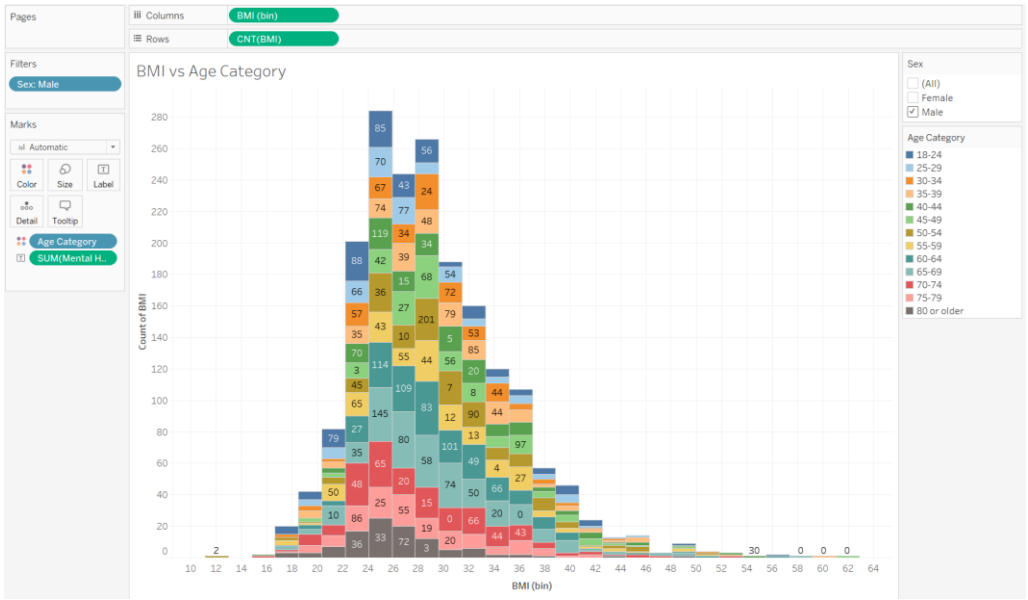

Pages
Columns
Rows
Filters
Marks
Pie
Color
Size
Label
Detail
Tooltip
Angle
Race
CNT(Heart D.. Δ
CNT(Heart Dis..
Race wise Heart Disease
0.73%
24.18%
1.58%
1.91%
70.47%
Race
American Indian/Alas..
Asian
Black
Hispanic
Other
White
CNT(Heart Disease)
4,500


Pages
Columns
Heart Disease
Diabetic
Age Category
Rows
AVG(BMI)
Filters
Stroke
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Age Category
People got stroke suffering from Diabetics and Heart Disease
Heart Disease / Diabetic / Age Category
No
Yes
No
No, borderline diabetes
Yes
Yes (during pregn..
No
No, borderli..
Yes
Avg. BMI
Stroke
(All)
No
Yes
Age Category
18-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80 or older


Pages
Columns
Rows
Filters
Heart Disease: Yes
Marks
Circle
Color
Size
Label
Detail
Tooltip
CNT(Heart Dis..
Gen Health
CNT(Heart Dis..
Gen Health
General Health vs Heart Disease
Very good
67
Poor
92
Excellent
12
Fair
140
Good
172
Gen Health
Excellent
Fair
Good
Poor
Very good

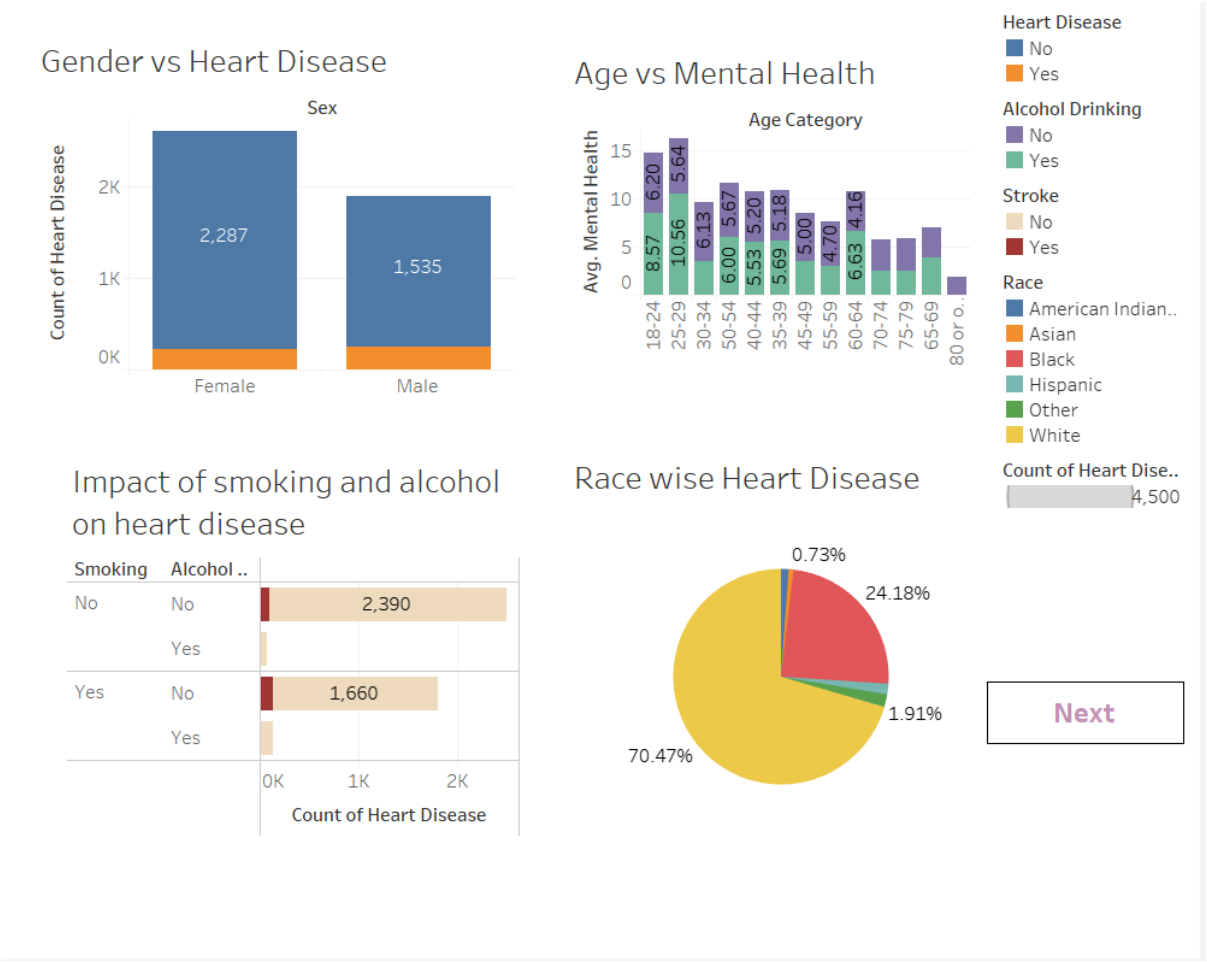

Pages
Columns
Rows
Filters
Sex
Marks
Automatic
Color
Size
Label
Detail
Tooltip
SUM(Mental H..
SUM(Mental H..
Heart Disease
Skin Cancer
Impact of Skin Cancer on Heart Disease
No
No
No
Yes
Yes
No
Yes
Yes
Sex
(All)
Female
Male
SUM(Mental Health)
591
15,934

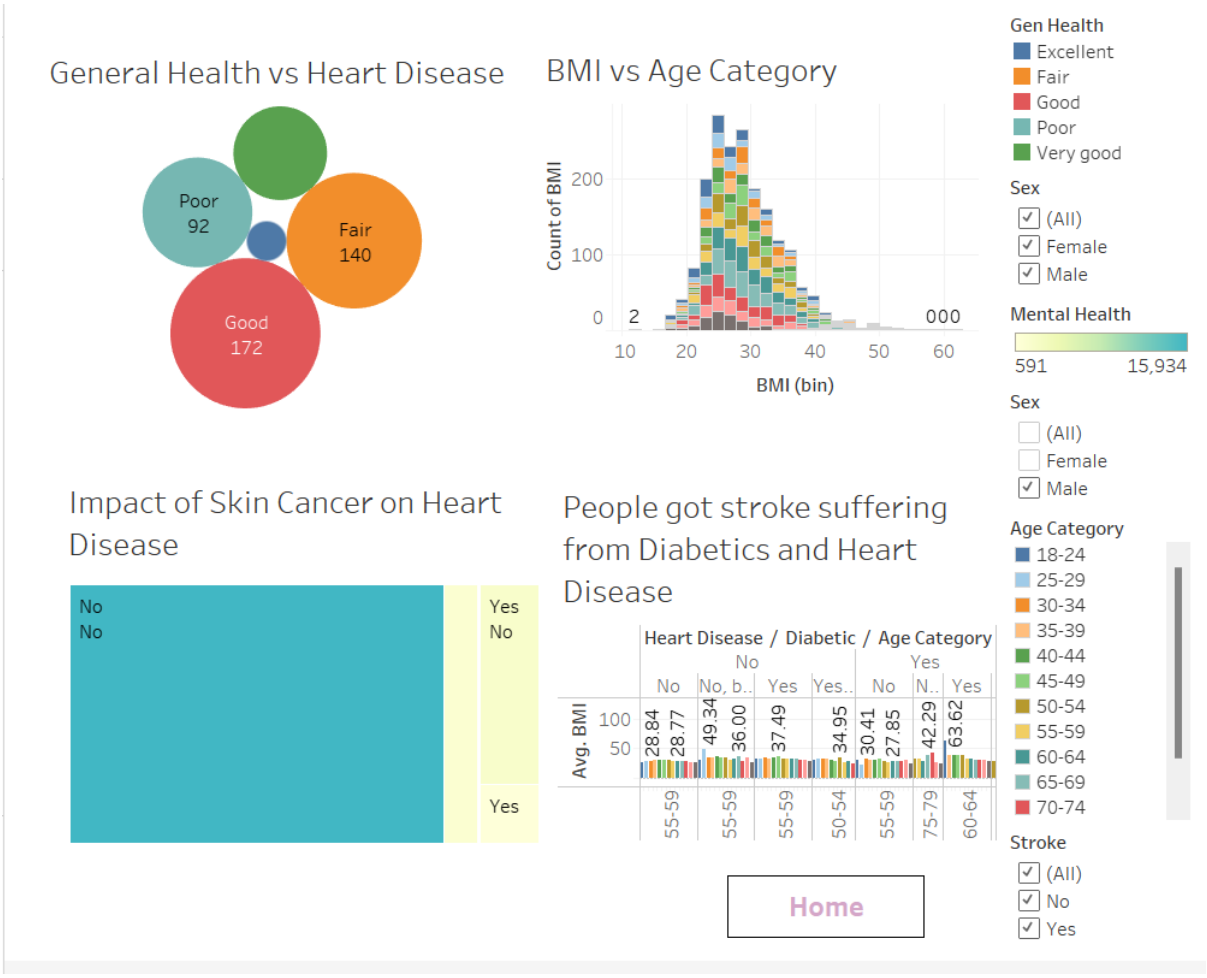

Pages
Columns
Alcohol Drinking
Rows
SUM(Physical Healt..
Filters
Gen Health: Good
Marks
Area
Color
Size
Label
Detail
Tooltip
Stroke
Alcohol Drinking
SUM(Physical ..
CNT(Heart Dis..
Impact of Alcohol on Physical Health
Alcohol Drinking
Physical Health
4000
3500
3000
2500
2000
1500
1000
500
0
No
3,712
No
272
No
Yes
Gen Health
(All)
Excellent
Fair
Good
Poor
Very good
Stroke
No
Yes


Pages
Columns
BMI (bin)
Rows
CNT(BMI)
Filters
Sex: Male
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Age Category
SUM(Mental H..
BMI vs Age Category
Count of BMI
BMI (bin)
Sex
(All)
Female
Male
Age Category
18-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80 or older

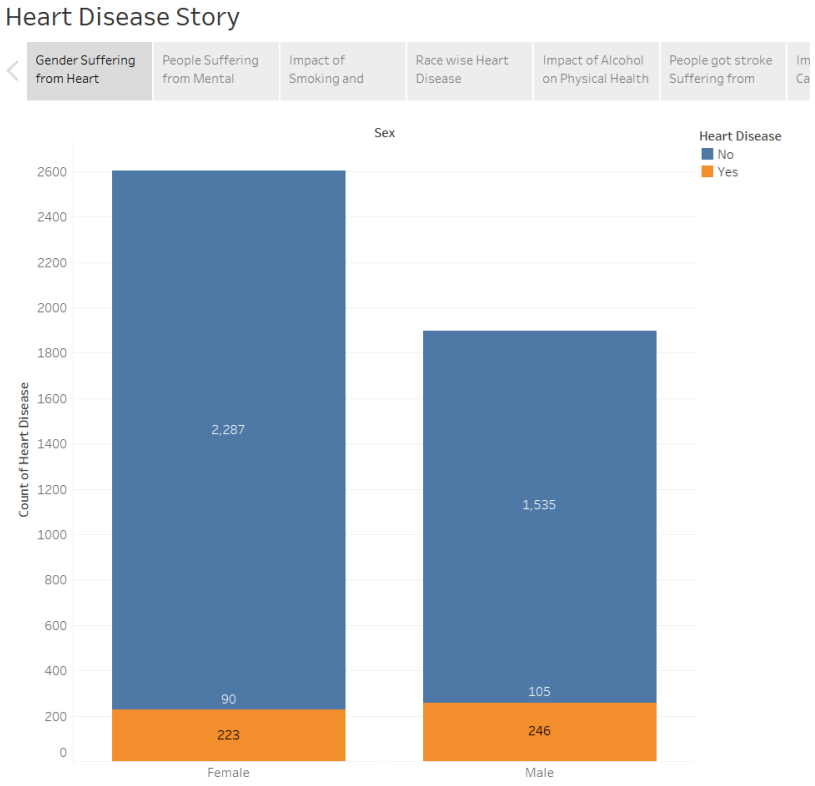
Dashboard

Responsive and Design of Dashboard:



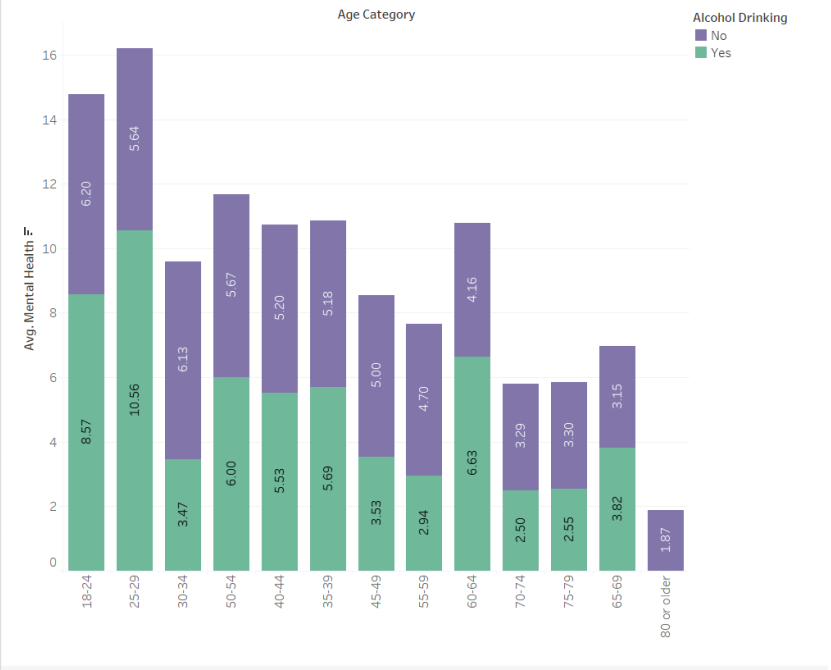


Story: No of scenes of Story: Total 9 unique scenes of story.



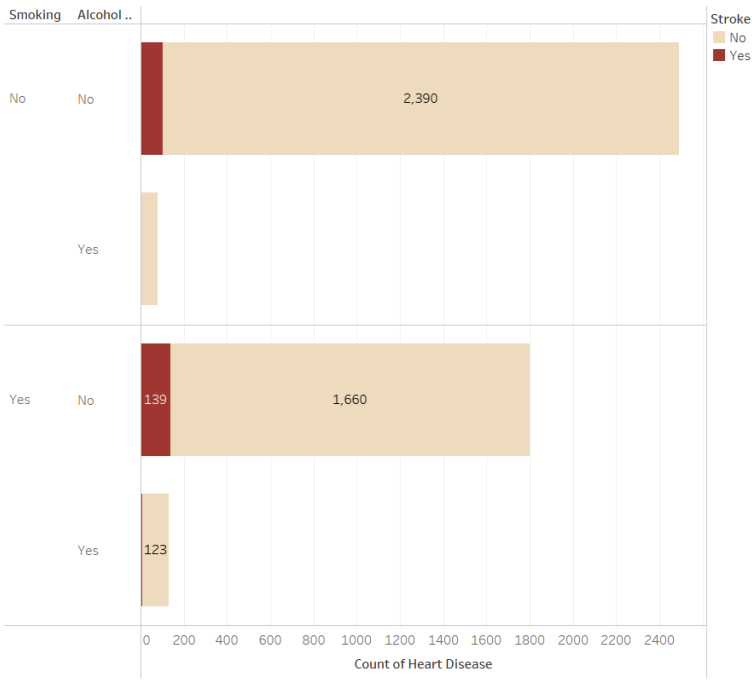
Heart Disease Story

Gender Suffering from Heart | People Suffering from Mental | Impact of Smoking and | Race wise Heart Disease | Impact of Alcohol on Physical Health | People got stroke Suffering from | Im Ca



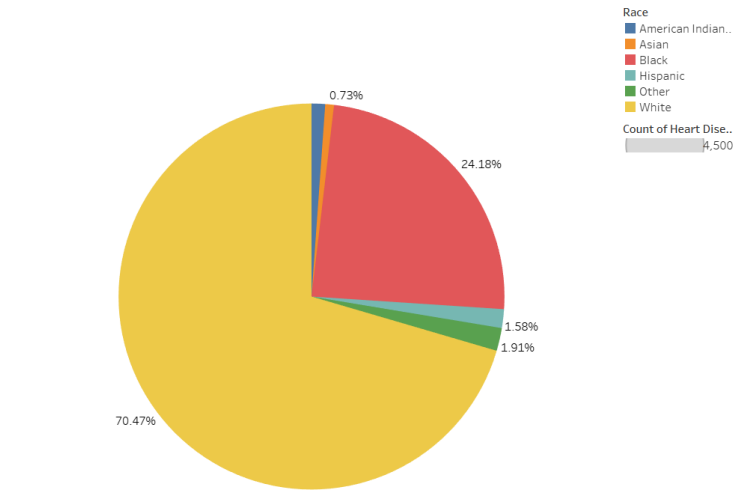
Heart Disease Story

Gender Suffering from Heart | People Suffering from Mental | Impact of Smoking and | Race wise Heart Disease | Impact of Alcohol on Physical Health | People got stroke Suffering from | Im Ca



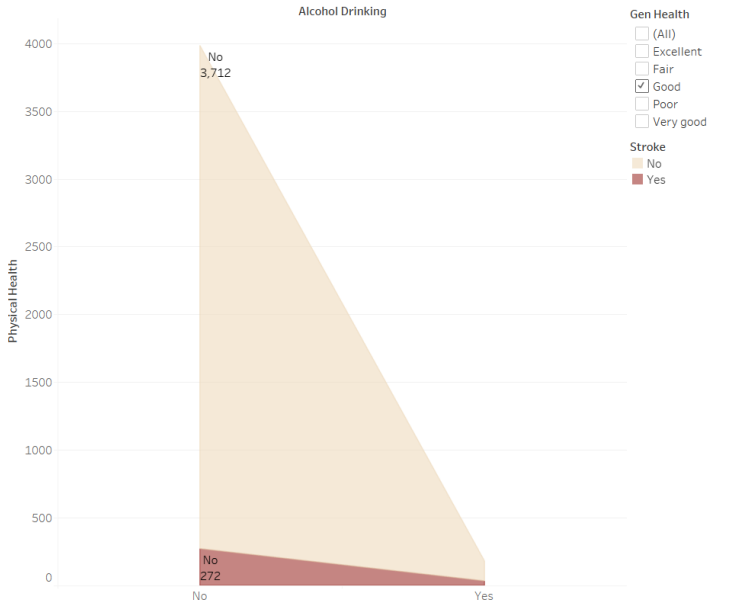
Heart Disease Story

Gender Suffering from Heart | People Suffering from Mental | Impact of Smoking and | Race wise Heart Disease | Impact of Alcohol on Physical Health | People got stroke Suffering from | Im Ca



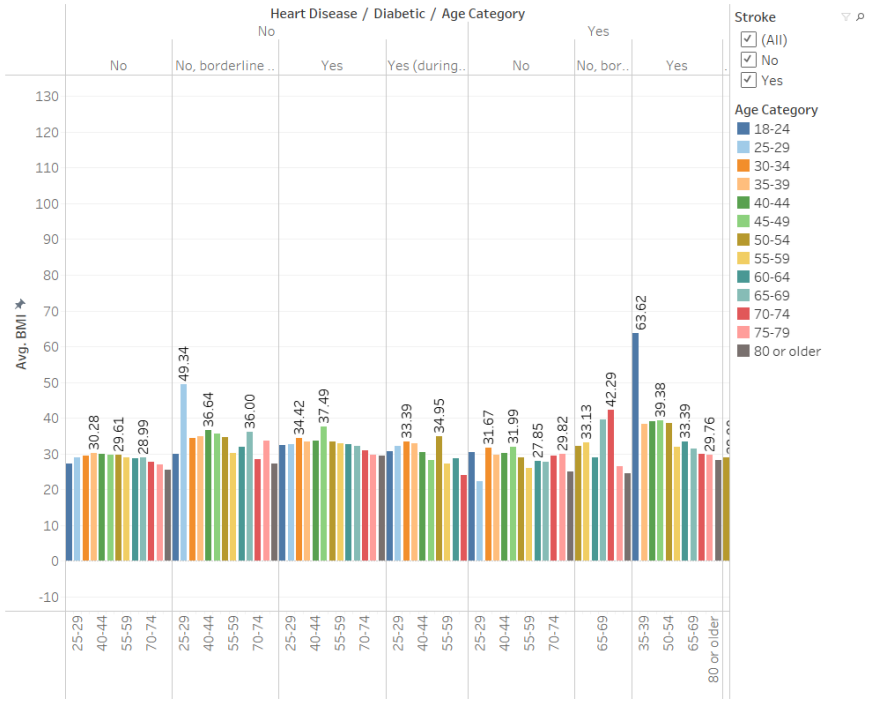
Heart Disease Story

Gender Suffering from Heart | People Suffering from Mental | Impact of Smoking and | Race wise Heart Disease | Impact of Alcohol on Physical Health | People got stroke Suffering from | Im Ca



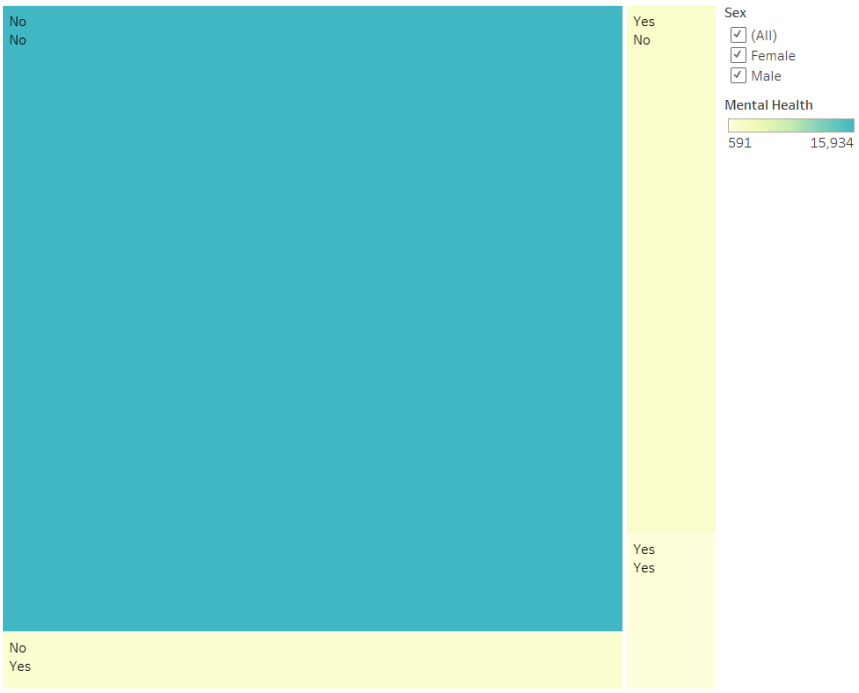
Heart Disease Story

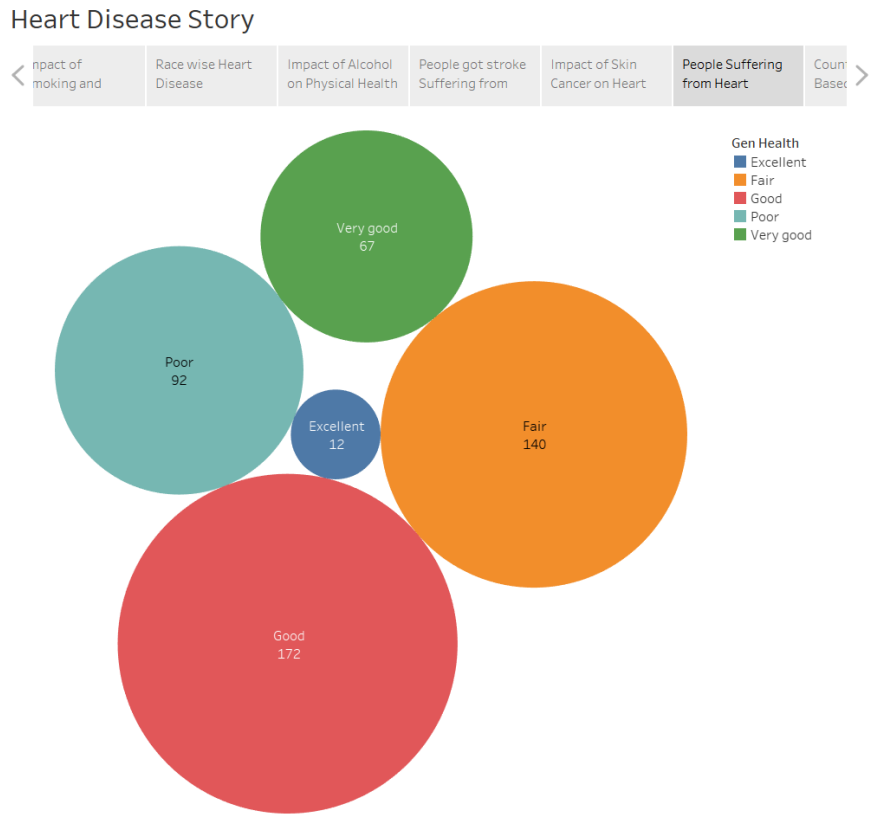
Gender Suffering from Heart | People Suffering from Mental | Impact of Smoking and | Race wise Heart Disease | Impact of Alcohol on Physical Health | People got stroke Suffering from | Im Ca

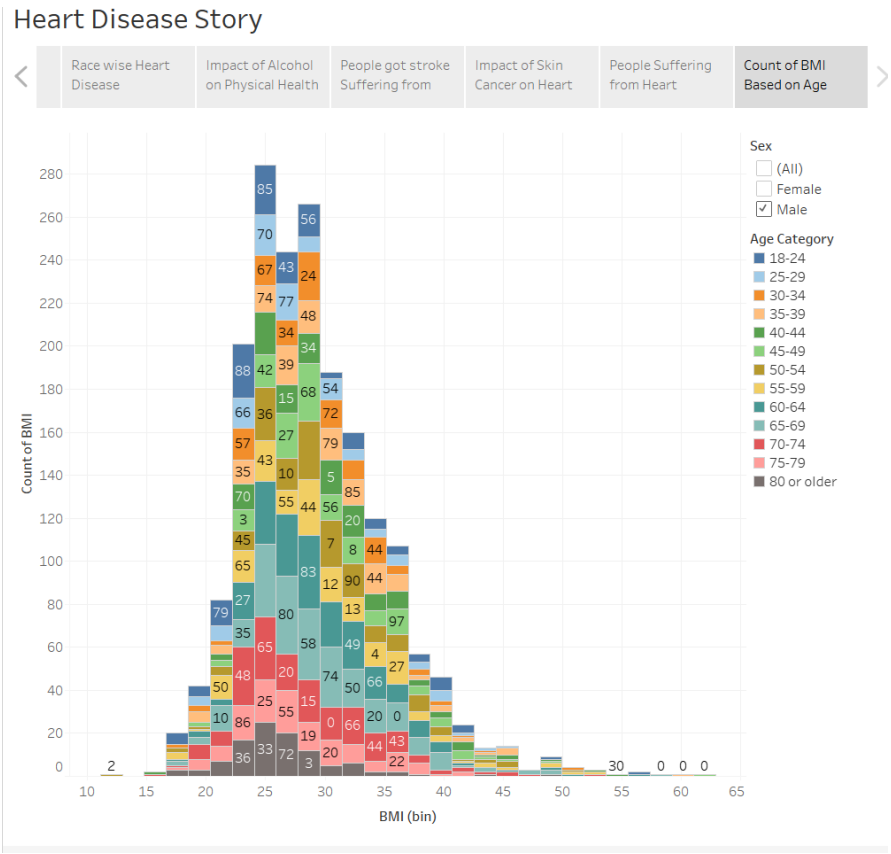


Heart Disease Story

eople Suffering om Mental | Impact of Smoking and | Race wise Heart Disease | Impact of Alcohol on Physical Health | People got stroke Suffering from | Impact of Skin Cancer on Heart | Peopl from

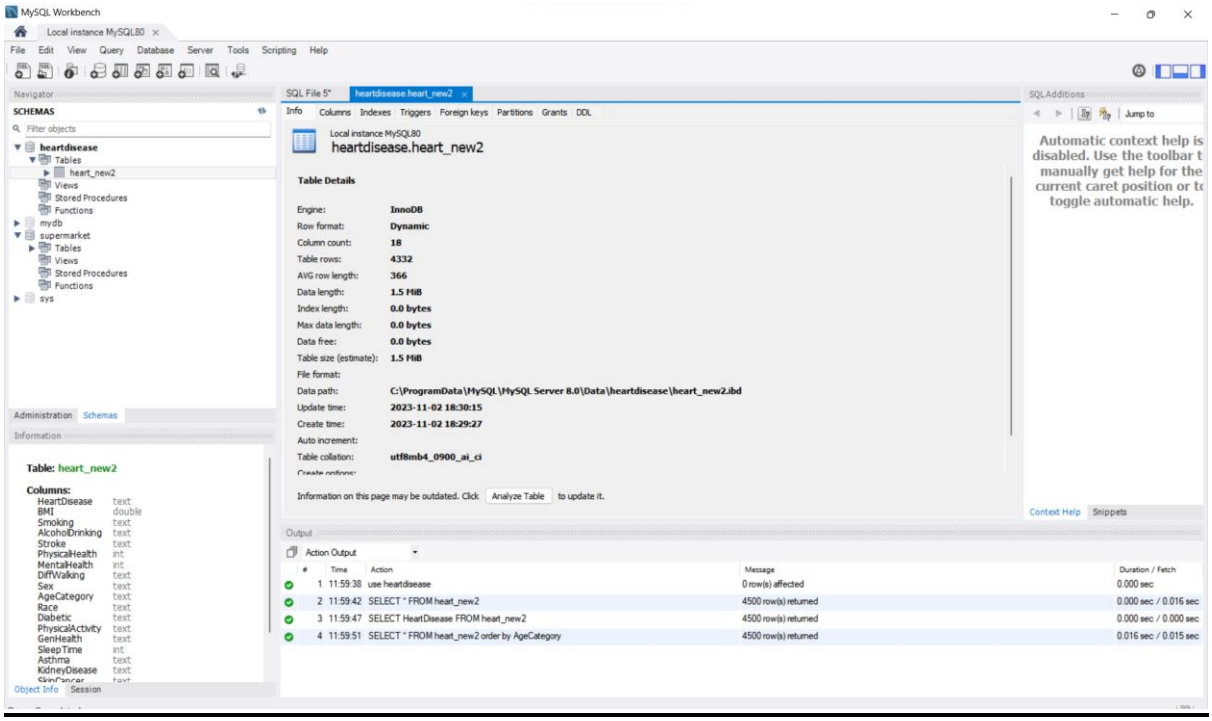




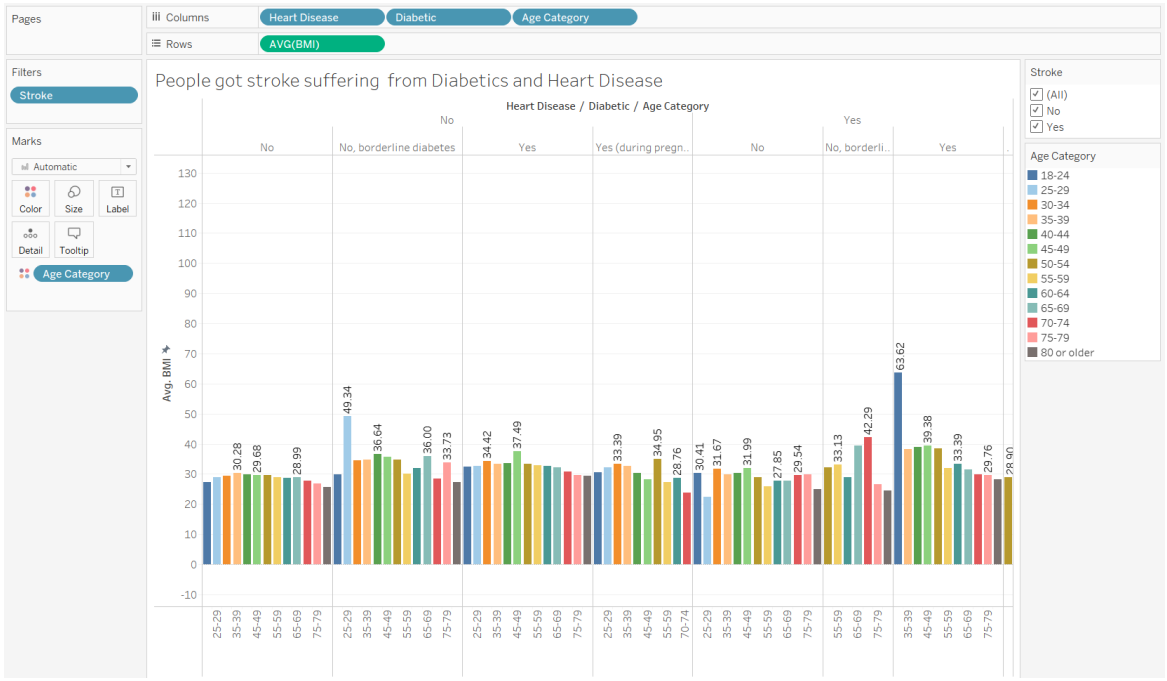


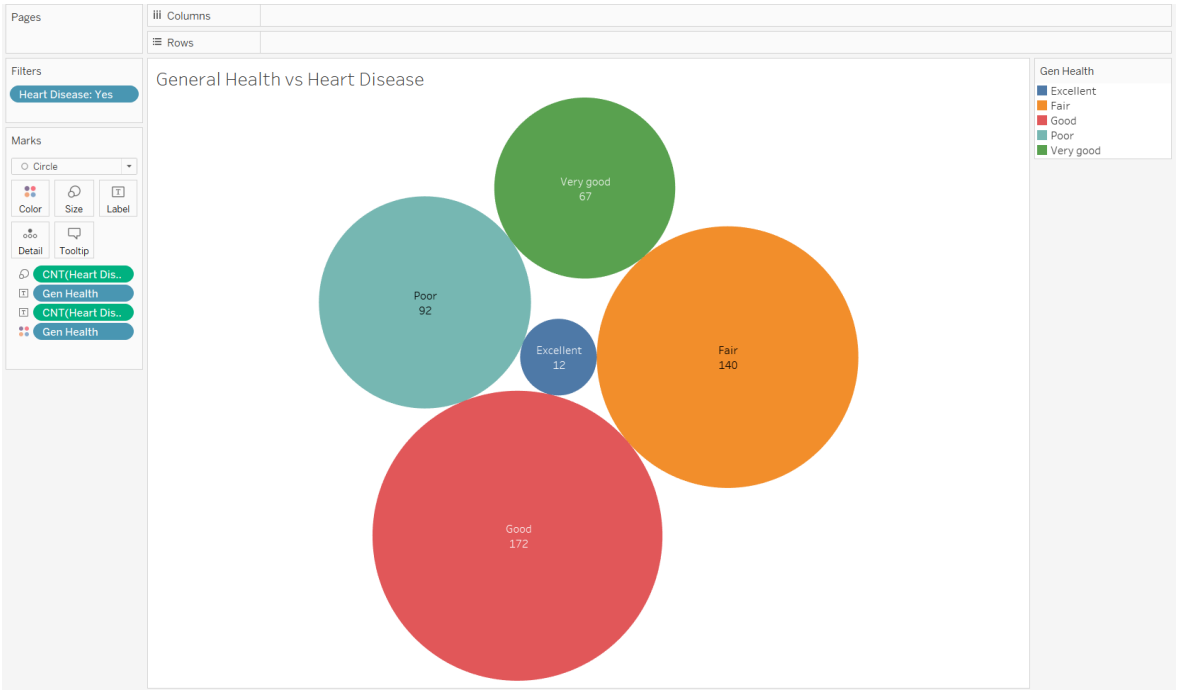
Performance Testing

Amount of Data Rendered to DB:

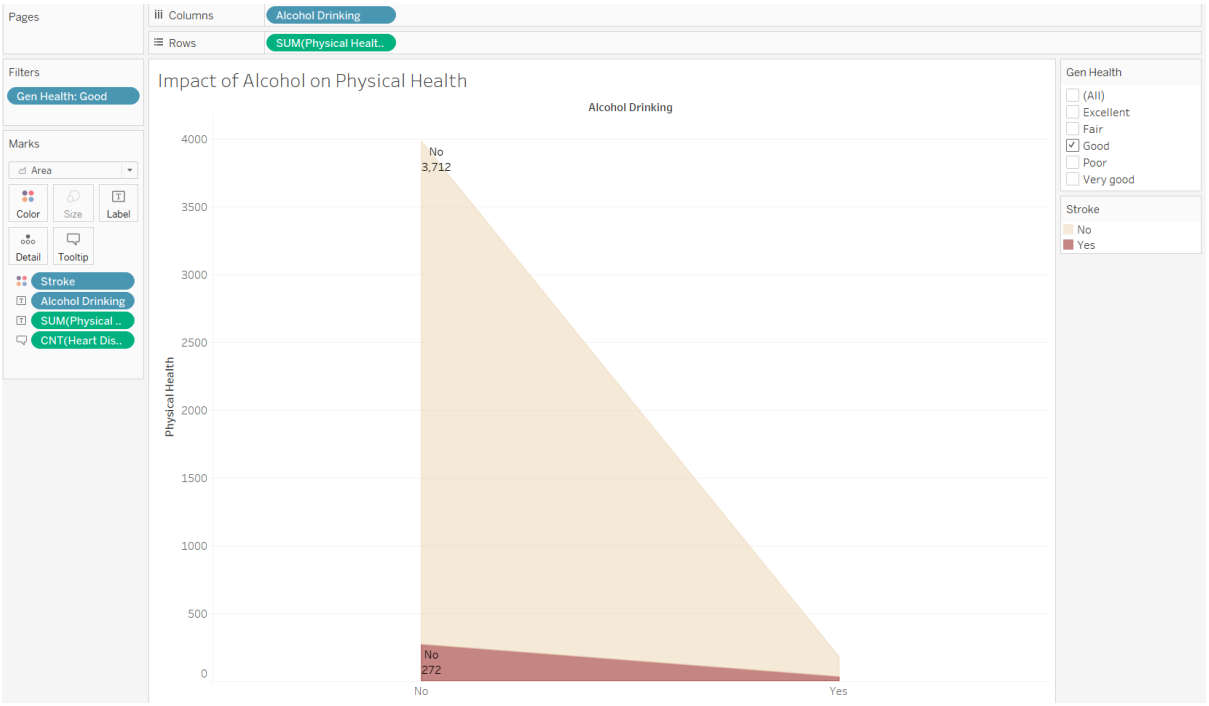


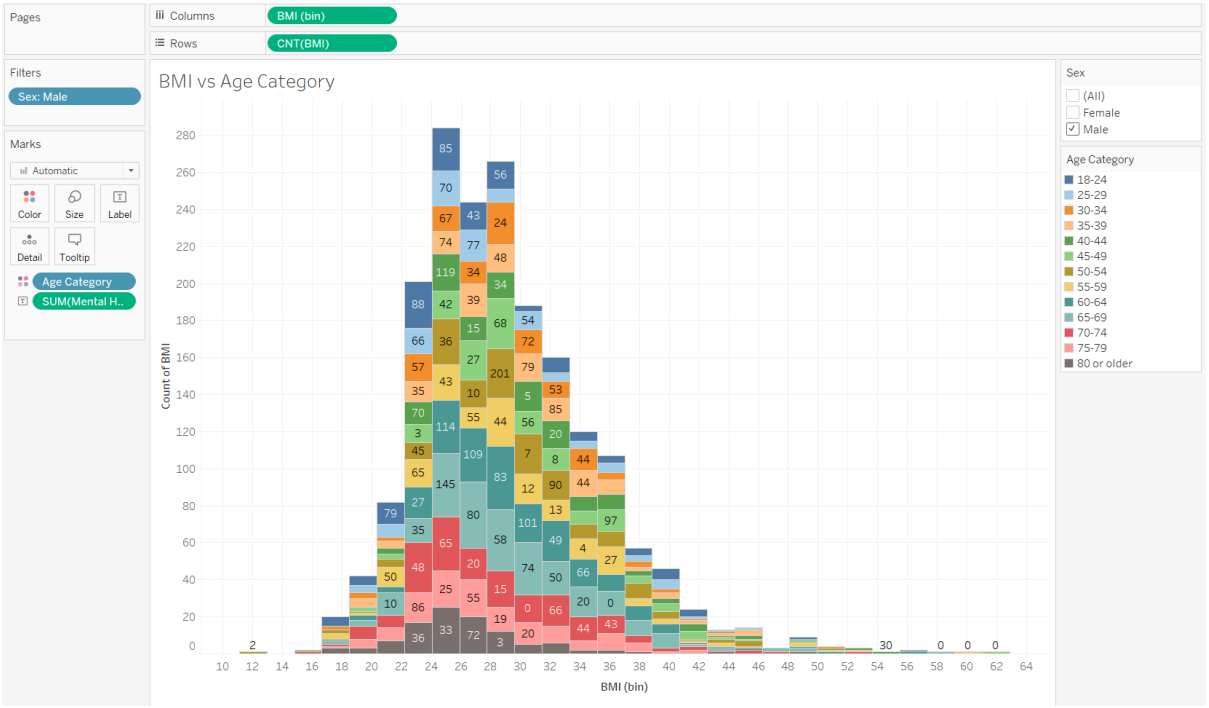
Utilization of Data Filters:




Pages
Columns
Rows
Filters
Heart Disease: Yes
Marks
Circle
Color
Size
Label
Detail
Tooltip
CNT(Heart Dis..
Gen Health
CNT(Heart Dis..
Gen Health
General Health vs Heart Disease
Very good
67
Poor
92
Excellent
12
Fair
140
Good
172
Gen Health
Excellent
Fair
Good
Poor
Very good


Pages
Columns
Rows
Filters
Sex
Marks
Automatic
Color
Size
Label
Detail
Tooltip
SUM(Mental H..
SUM(Mental H..
Heart Disease
Skin Cancer
Impact of Skin Cancer on Heart Disease
No
No
No
Yes
Yes
No
Yes
Yes
Sex
(All)
Female
Male
SUM(Mental Health)
591
15,934





No of Calculation Fields: In this analysis we have not created any new column using calculation filed as data found in dataset was clean and sufficient for analysis.

No of Visualizations/ Graphs:

1. **Gender wise Heart Disease**
2. **Age wise Mental Health**

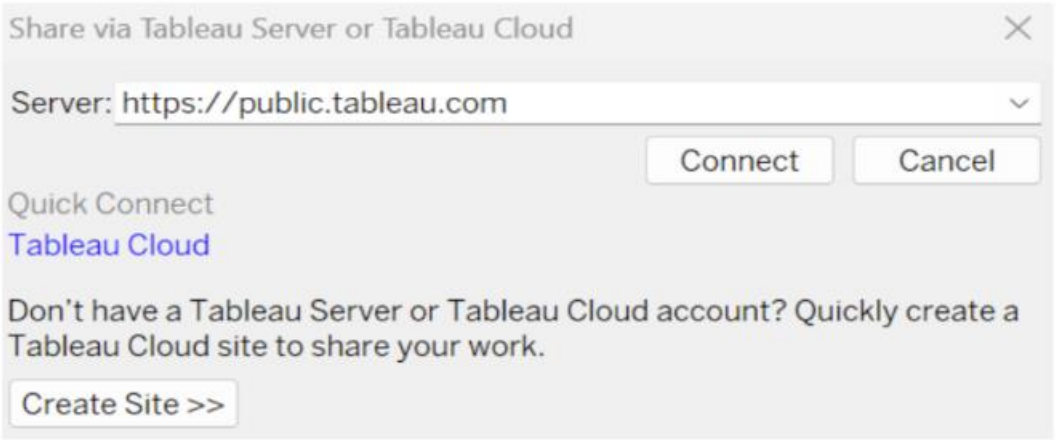
3. **Impact of Smoking and Alcohol**
4. **Sleeping wise Heart Disease**
5. **Race wise Heart Disease**
6. **People got stroke suffering from Diabetics and Heart Disease**
7. **General Health wise Heart Disease**
8. **Impact of Skin Cancer on Heart Disease**
9. **Impact of Alcohol on Physical Health**
10. **BMI wise Age Category**

Web Integration

Publishing helps us to track and monitor key performance metrics and to communicate results and progress. help a publisher stay informed, make better decisions, and communicate their performance to others.

Publishing dashboard and reports to tableau public

Step 1: Go to Dashboard/story, click on the share button on the top ribbon



Give the server address of your tableau public account and click on connect.

Step 2: Once you click on connect it will ask you for the tableau public username and password

Once you login into your tableau public using the credentials, the particular

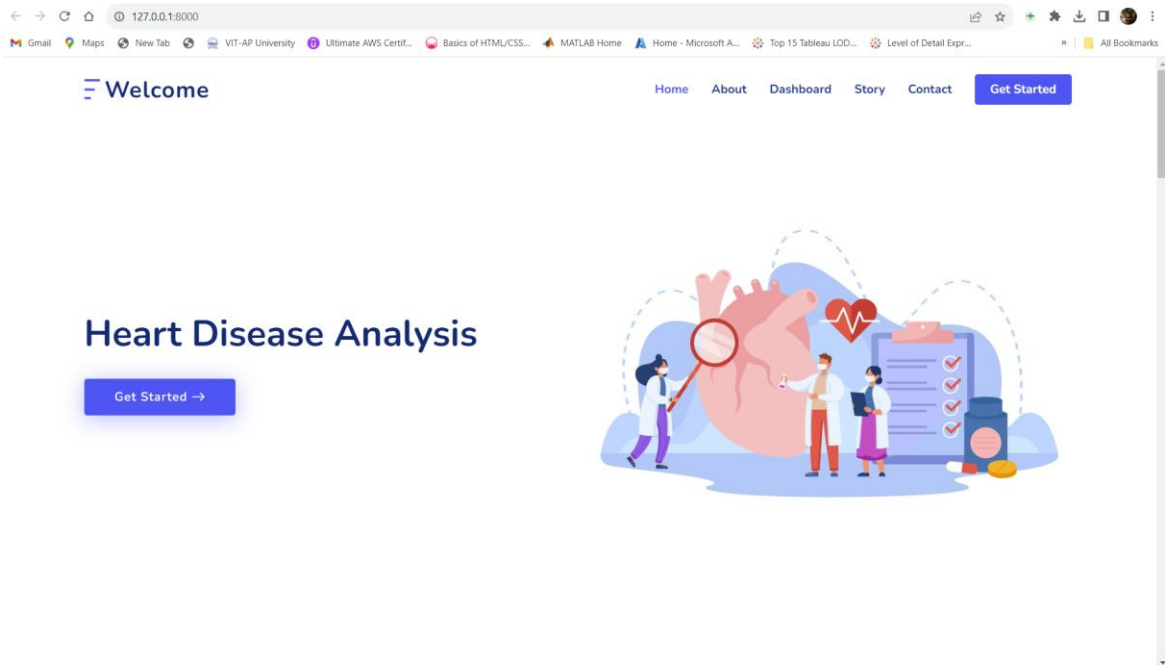
visualization will be published into the tableau public

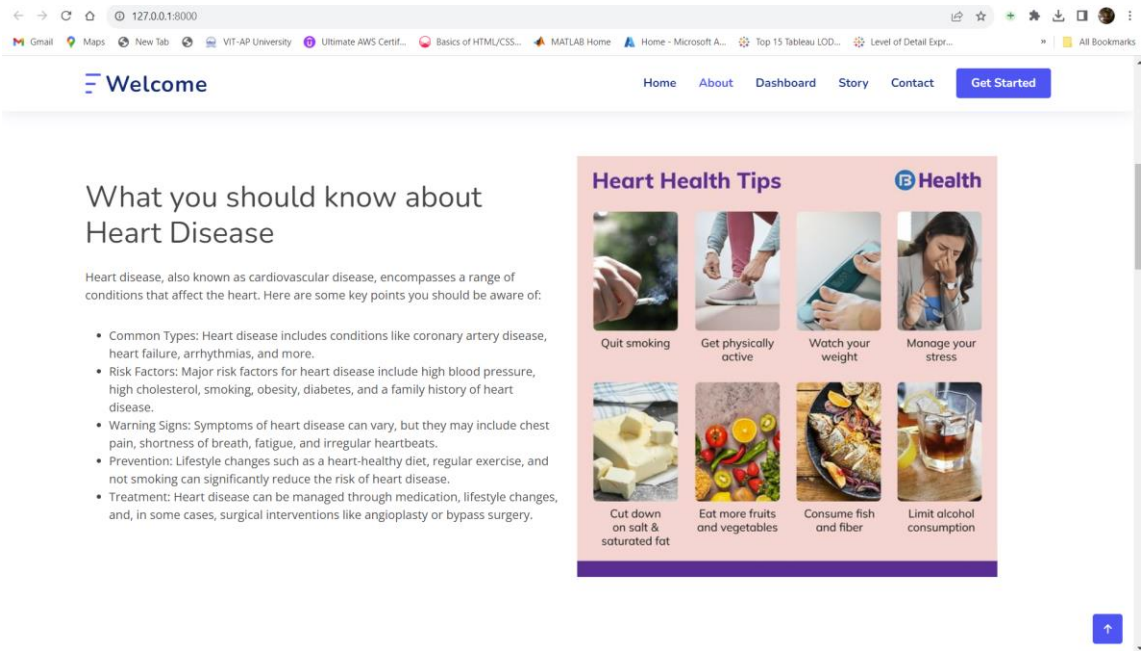
These are the dashboard and story links which we have Published

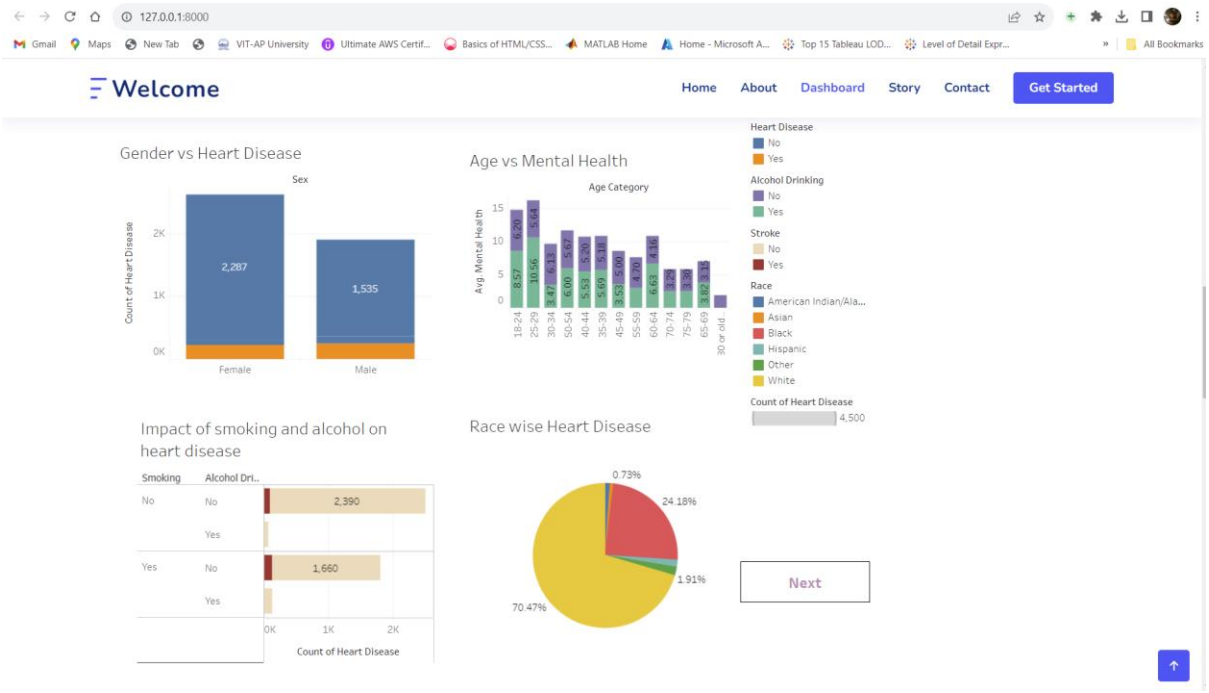
https://public.tableau.com/app/profile/vishnupriya.pragada/viz/Dashboard_16989481972700/Dashboard1?publish=yes

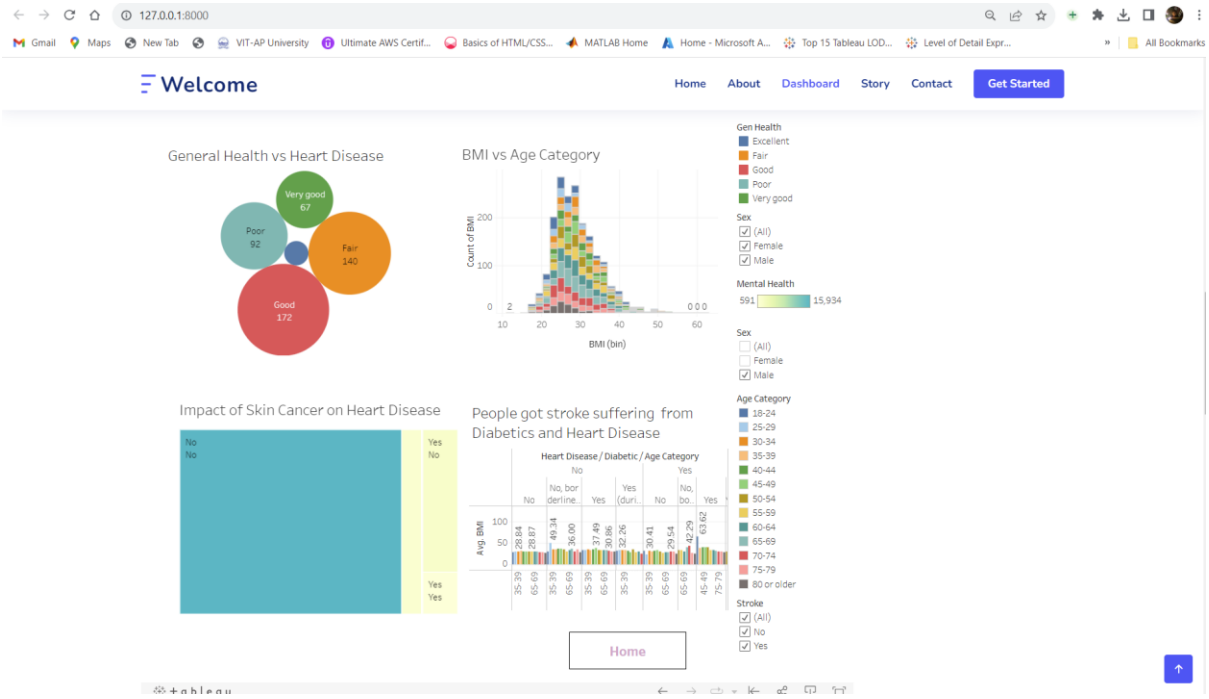
https://public.tableau.com/app/profile/vishnupriya.pragada/viz/Story_16989482739400/Story1?publish=yes

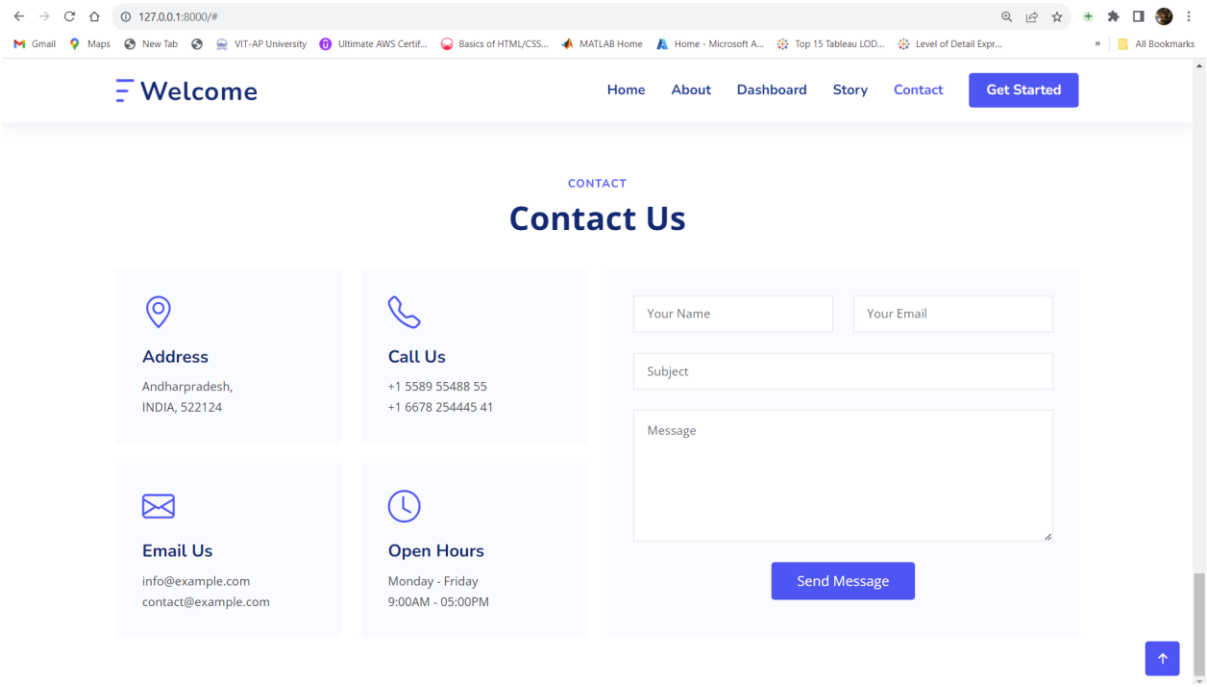
Embed Dashboard and Story with Flask:






127.0.0.1:8000
Welcome
Home
About
Dashboard
Story
Contact
Get Started
Gender vs Heart Disease
Sex
Count of Heart Disease
2K
1K
0K
2,287
1,535
Female
Male
Age vs Mental Health
Age Category
Avg. Mental Health
15
10
5
0
6.20
8.57
10.56
5.64
6.47
6.13
6.00
5.93
5.53
5.20
5.69
5.18
5.53
5.00
6.63
4.80
6.63
4.16
4.29
3.38
3.82
3.33
18-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80 or old
Heart Disease
No
Yes
Alcohol Drinking
No
Yes
Stroke
No
Yes
Race
American Indian/Ala...
Asian
Black
Hispanic
Other
White
Count of Heart Disease
4,500
Impact of smoking and alcohol on heart disease
Smoking
Alcohol Dri..
No
No
Yes
Yes
No
Yes
2,390
1,660
0K
1K
2K
Count of Heart Disease
Race wise Heart Disease
0.73%
24.18%
1.91%
70.47%
Next


127.0.0.1:8000
Welcome
Home
About
Dashboard
Story
Contact
Get Started
General Health vs Heart Disease
Very good
67
Poor
92
Fair
140
Good
172
BMI vs Age Category
Count of BMI
200
100
0
2
0 0 0
10
20
30
40
50
60
BMI (bin)
Gen Health
Excellent
Fair
Good
Poor
Very good
Sex
(All)
Female
Male
Mental Health
591
15,934
Sex
(All)
Female
Male
Age Category
18-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80 or older
Stroke
(All)
No
Yes
Impact of Skin Cancer on Heart Disease
No
No
Yes
No
Yes
Yes
People got stroke suffering from Diabetics and Heart Disease
Heart Disease / Diabetic / Age Category
No
Yes
No
No, bor derline..
Yes
Yes (duri..
No
No, bo..
Yes
Avg BMI
100
50
0
28.84
28.87
49.34
36.00
37.49
30.86
32.26
30.41
29.54
42.29
63.62
35-39
65-69
35-39
65-69
35-39
65-69
35-39
35-39
65-69
65-69
45-49
75-79
Home
+ableau


127.0.0.1:8000/#
Gmail
Maps
New Tab
VIT-AP University
Ultimate AWS Certif...
Basics of HTML/CSS...
MATLAB Home
Home - Microsoft A...
Top 15 Tableau LOD...
Level of Detail Expr...
All Bookmarks
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CONTACT
Contact Us
Address
Andharpradesh,
INDIA, 522124
Call Us
+1 5589 55488 55
+1 6678 254445 41
Email Us
info@example.com
contact@example.com
Open Hours
Monday - Friday
9:00AM - 05:00PM
Your Name
Your Email
Subject
Message
Send Message