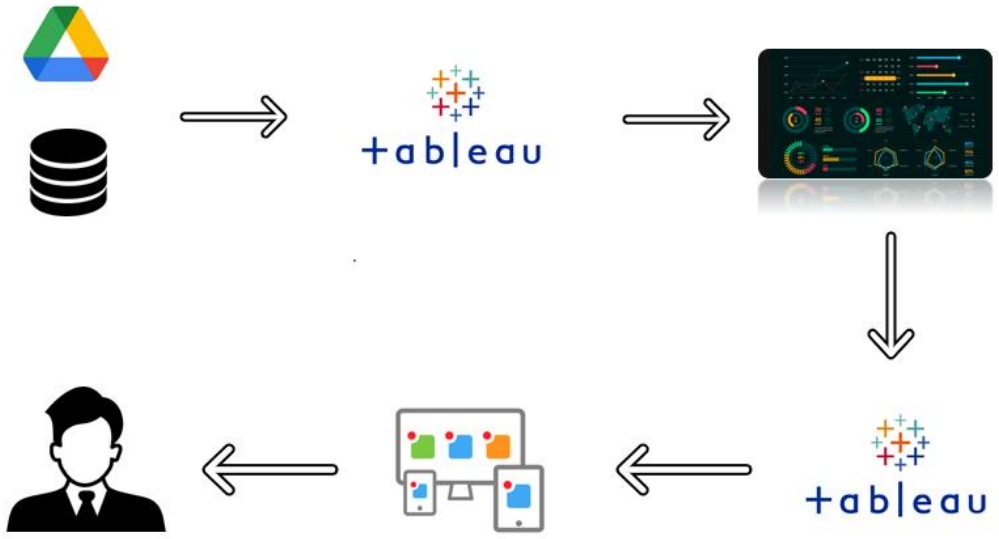
Heart Disease Analysis

Heart disease (heart disease) is a group of diseases related to cardiovascular diseases, manifested by a violation of the normal functioning of the heart. May be caused by damage to the epicardium, pericardium, myocardium, endocardium, valvular apparatus of the heart, heart vessels.

According to the National Heart, Lung and Blood Institute in Framingham (USA), the most important factors in the development of cardiovascular disease in humans are obesity, sedentary lifestyle and smoking.

In this project we are trying to analyze the Heart disease related data and be able to extract some insights from the data using Business Intelligence tools. To Extract the Insights from the data and put the data in the form of visualizations, Dashboards and Story we employed Tableau tool

Technical Architecture :



Project Flow

To accomplish this, we have to complete all the activities listed below,

- Define Problem / Problem Understanding
  - Specify the business problem
  - Business requirements
  - Literature Survey
  - Social or Business Impact.
- Data Collection & Extraction from Database
  - Collect the dataset,
  - Storing Data in DB
  - Perform SQL Operations
  - Connect DB with Tableau
- Data Preparation
  - Prepare the Data for Visualization
- Data Visualizations
  - No of Unique Visualizations
- Dashboard
  - Responsive and Design of Dashboard
- Story

- No of Scenes of Story

- Performance Testing
  - Amount of Data Rendered to DB ‘
  - Utilization of Data Filters
  - No of Calculation Fields
  - No of Visualizations/ Graphs
- Web Integration
  - Dashboard and Story embed with UI With Flask
- Project Demonstration & Documentation
  - Record explanation Video for project end to end solution
  - Project Documentation-Step by step project development procedure

Milestone 1: Define Problem / Problem Understanding

Activity 1: Specify the business problem

Refer Project Description

Activity 2: 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 diseas , 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.

Activity 3: Literature Survey (Student Will Write)

A literature survey for the Heart disease analysis would involve researching and reviewing previous studies, articles, and reports on the topic. This could

include information on the methods and techniques used for analyzing heart disease, as well as the results and conclusions of these studies. A comprehensive literature survey should include peer-reviewed journals, scientific databases (e.g., PubMed, Scopus), conference proceedings, and authoritative sources in the field of cardiovascular medicine. The survey should encompass a range of studies, including clinical trials, observational studies, systematic reviews, and meta-analyses, to provide a comprehensive overview of the current knowledge landscape in the field of heart disease.

Activity 4: 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.

Milestone 2: Data Collection & Extraction from Database

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, evaluate outcomes and generate insights from the data.

Activity 1: Downloading the dataset

Please use the link to download the dataset: Link

Activity 1.1: Understand the data

Data contains all the meta information regarding the columns described in the CSV files

Column Description of the Dataset:

1. HeartDisease - 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. AlcoholDrinking - 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. PhysicalHealth - how many days in a month did you feel poor physical health.
7. MentalHealth - how many days in a month did you feel poor mental health.
8. DiffWalking - difficulty climbing stairs.
9. Sex - gender of a person.
10. AgeCategory - 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. PhysicalActivity - adults who reported doing physical activity or exercise during the past 30 days other than their regular job
14. GenHealth - well-being.
15. SleepTime - number of hours of sleep.
16. Asthma- Asthma is a chronic respiratory condition due to breathing Issue
17. KidneyDisease – Disease related to Kidney

18. Skin Cancer – People suffering from Skin Cancer

Milestone 3: Data Preparation

Activity 1: Prepare the Data for Visualization

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.

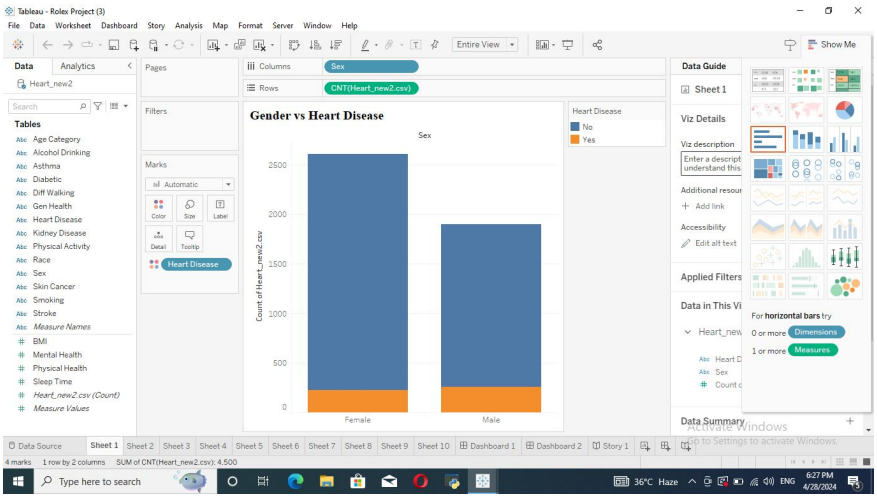
Milestone 4: Data Visualization

Data visualization is the process of creating graphical representations of data to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

Activity 1: No of Unique Visualizations

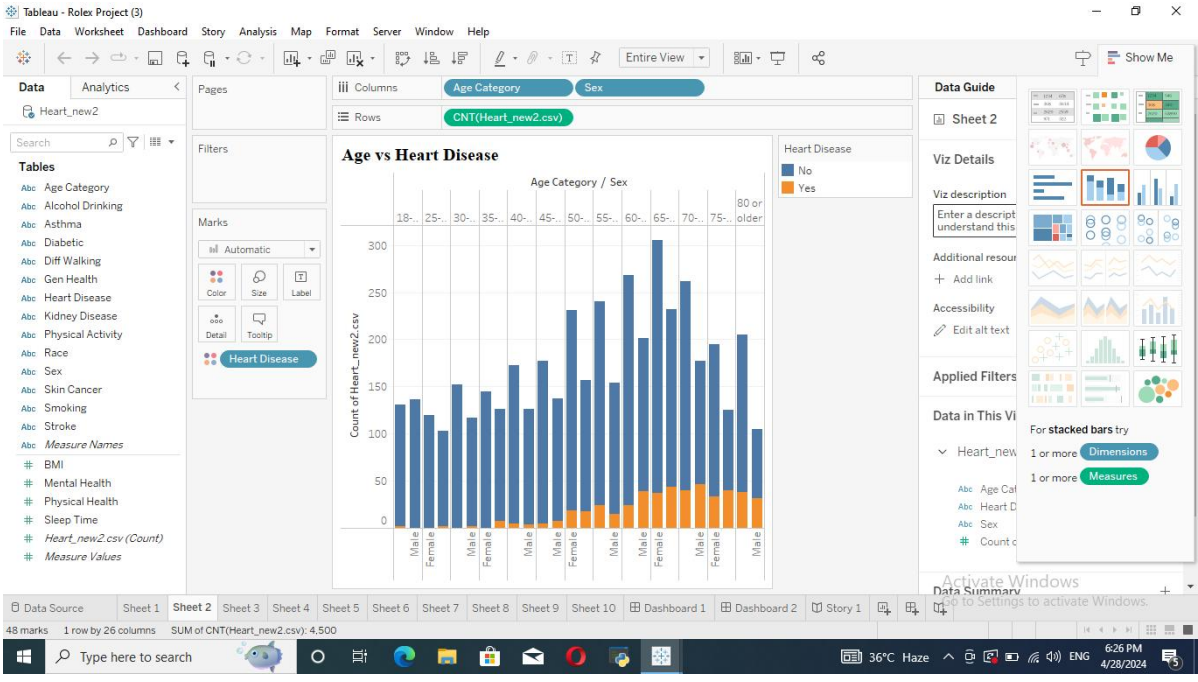
The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyze the performance and efficiency of banks include bar charts, line charts, heat maps, scatter plots, pie charts,Maps etc. These visualizations can be used to compare performance, track changes over time, show distribution, and relationships between variables, breakdown of revenue and customer demographics, workload, resource allocation and location of banks.

Activity 1.1 : Gender vs Heart

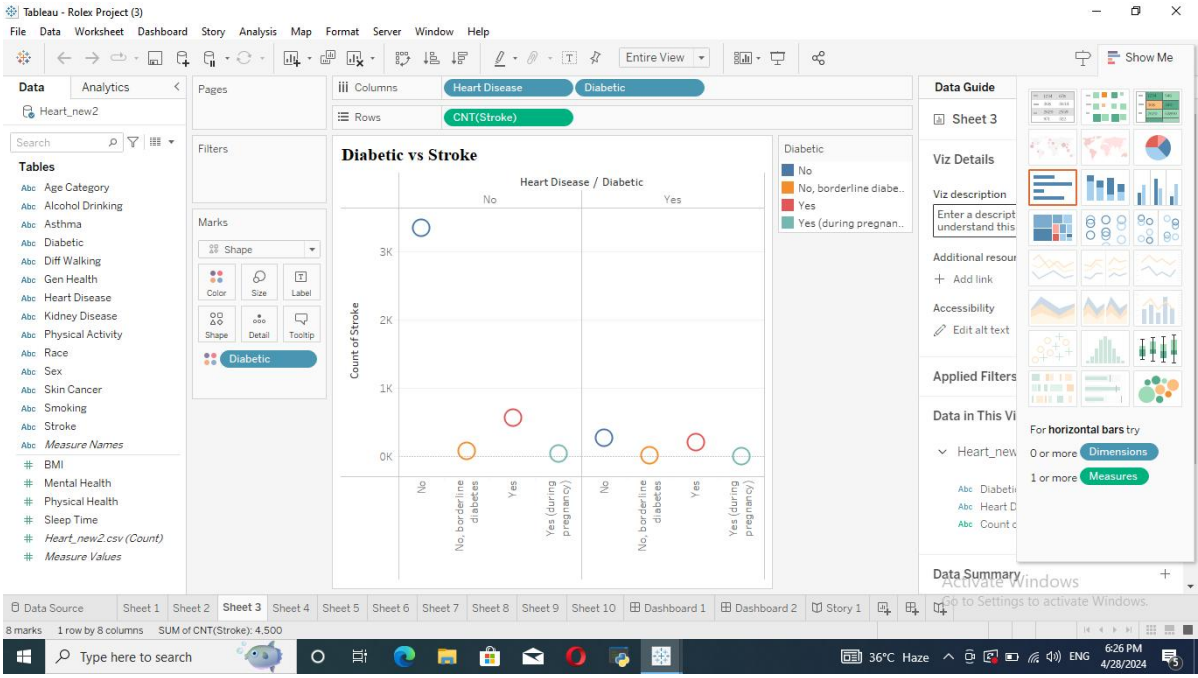


Disease

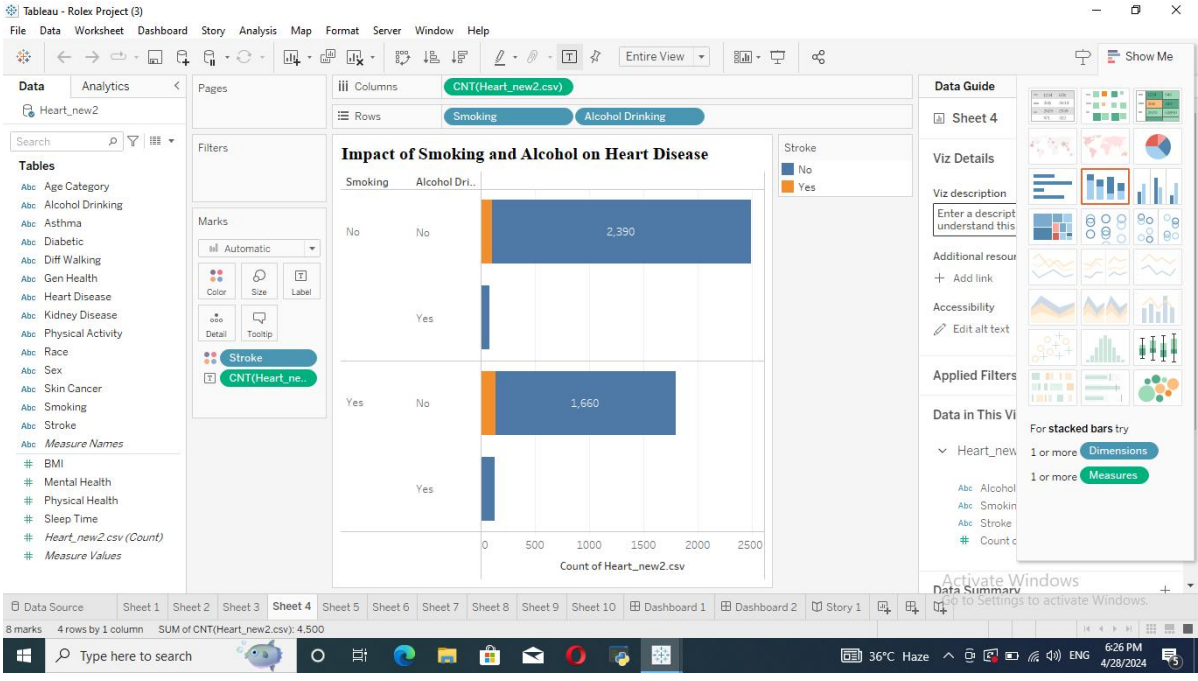
Activity 1.2: Age vs Heart Disease



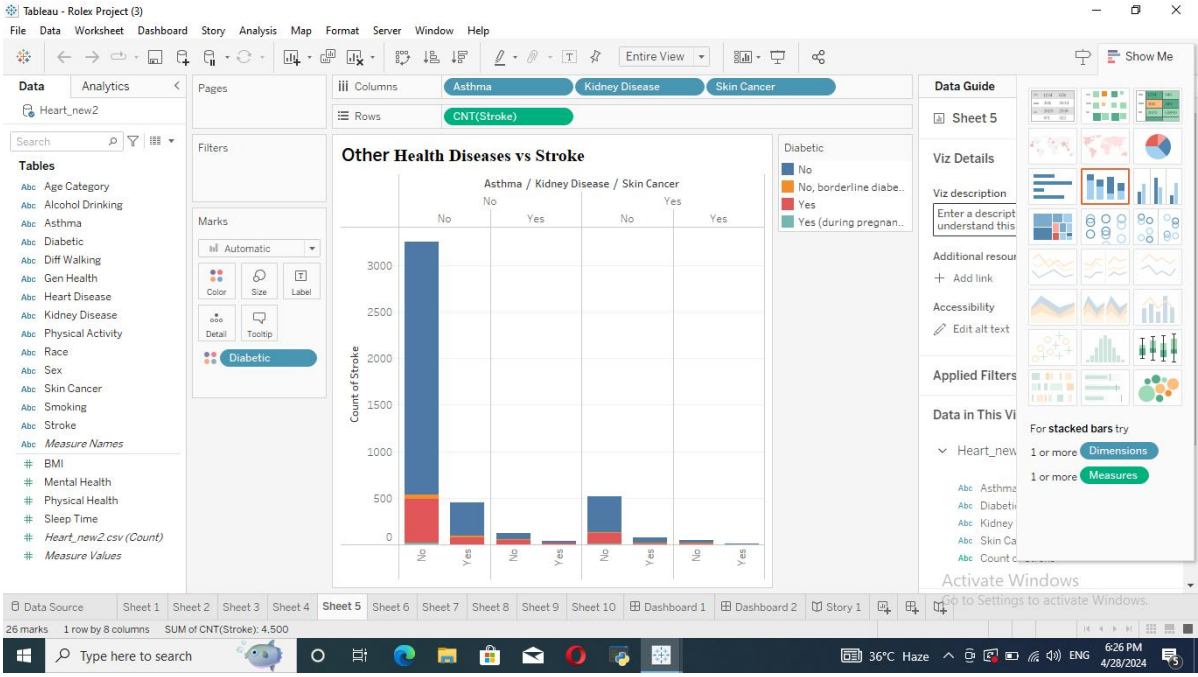
Activity 1.3: Diabetic vs Stroke



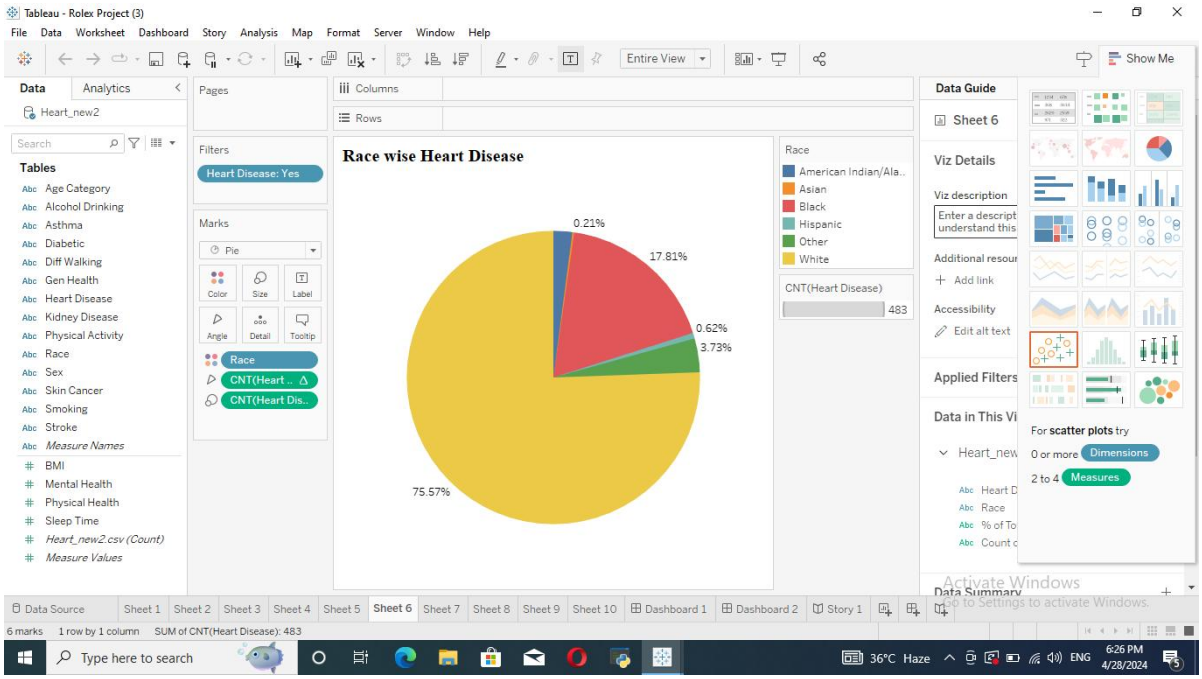
Activity 1.4: Impact of Smoking and Alcohol on Heart Disease



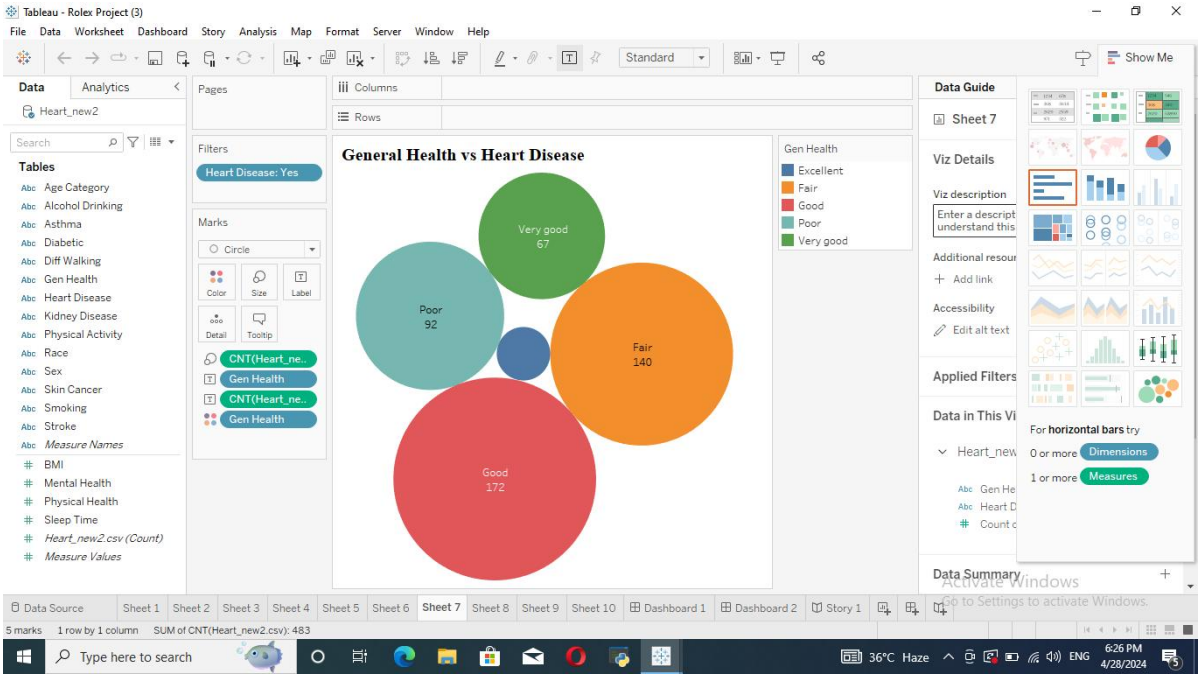
Activity 1.5 Other Health Diseases vs Stroke



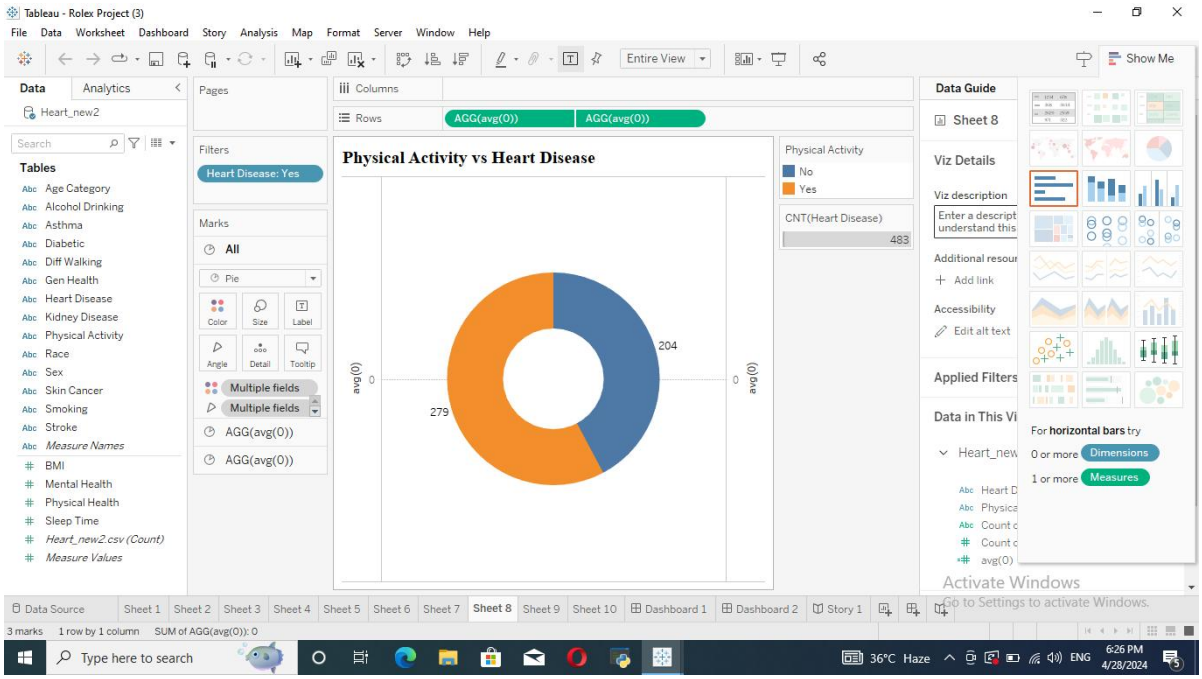
Activity 1.6: Race wise Heart Disease



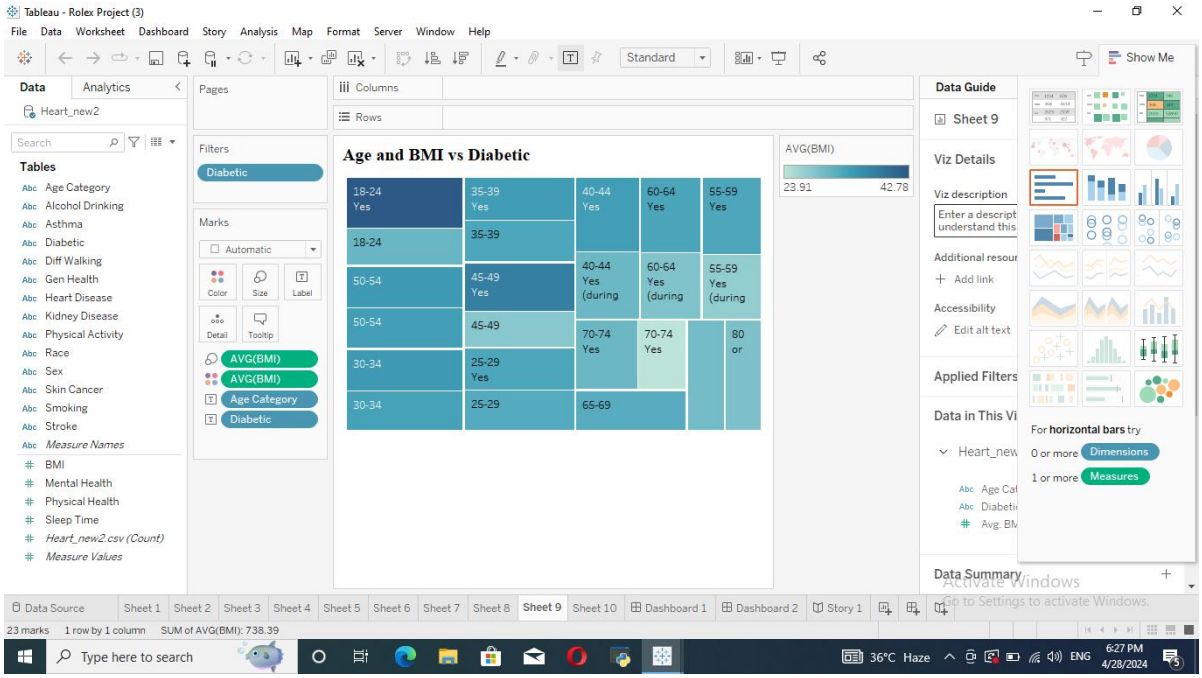
Activity 1.7: General Health vs Heart Disease



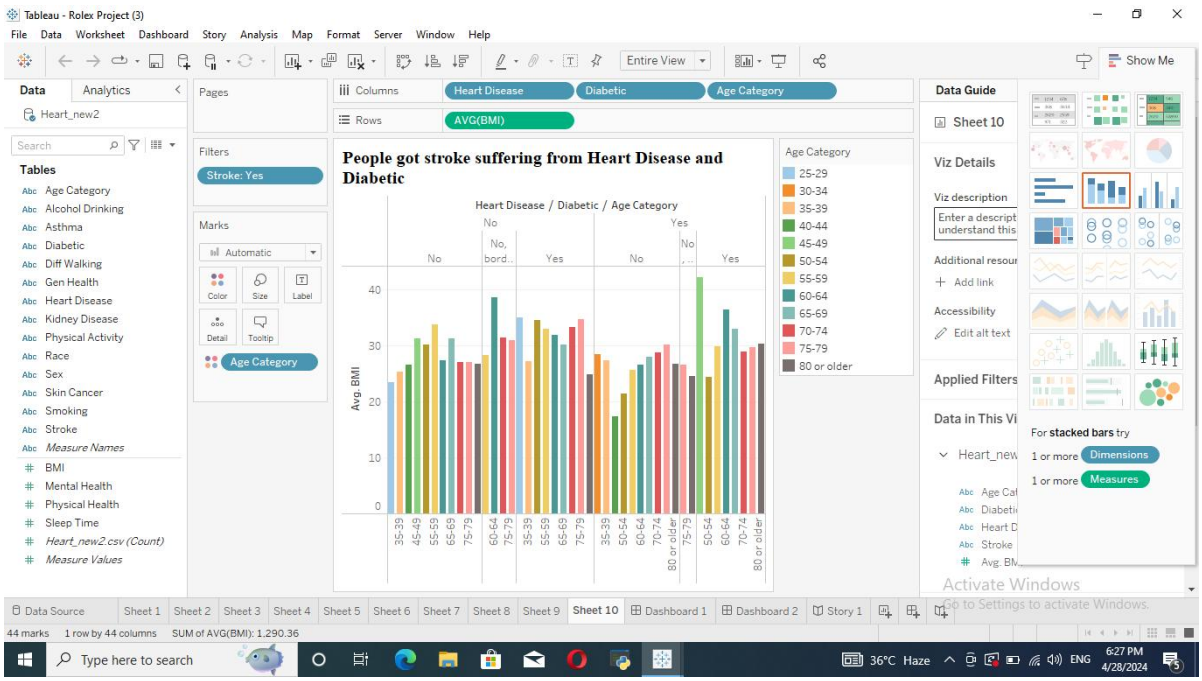
Activity 1.8: Physical Activity vs Heart Disease



Activity 1.9: Age and BMI vs Diabetic



Activity 1.10: People got stroke suffering from Heart Disease and Diabetic



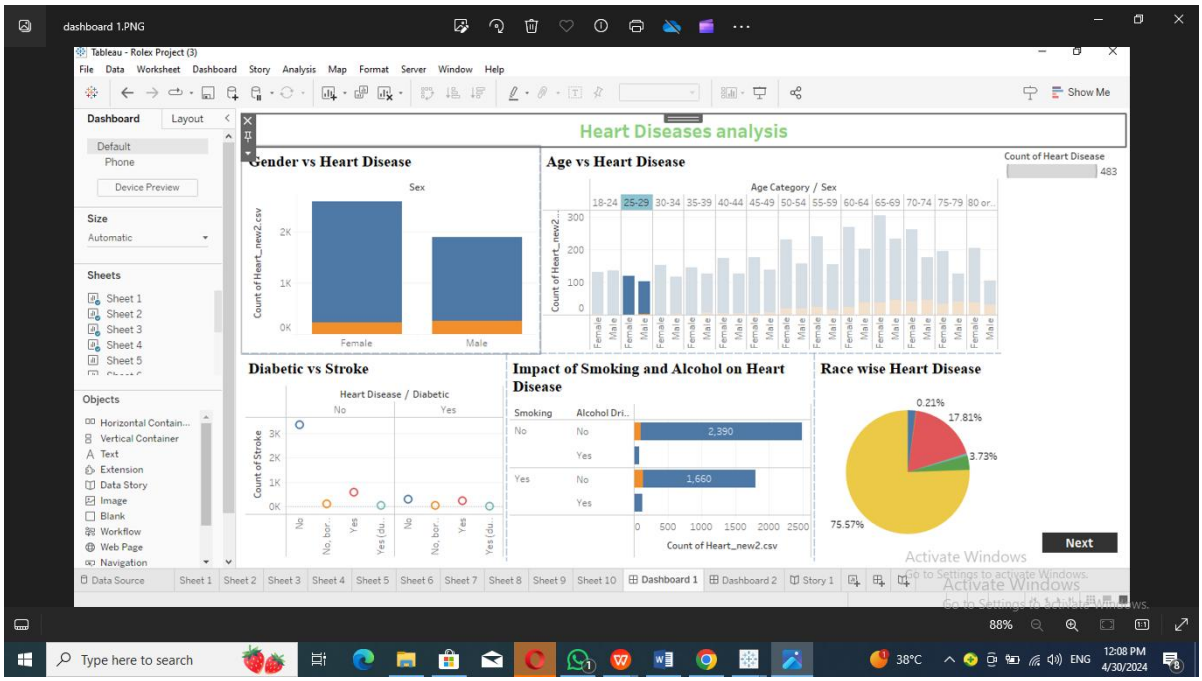
Milestone 5: Dashboard

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.

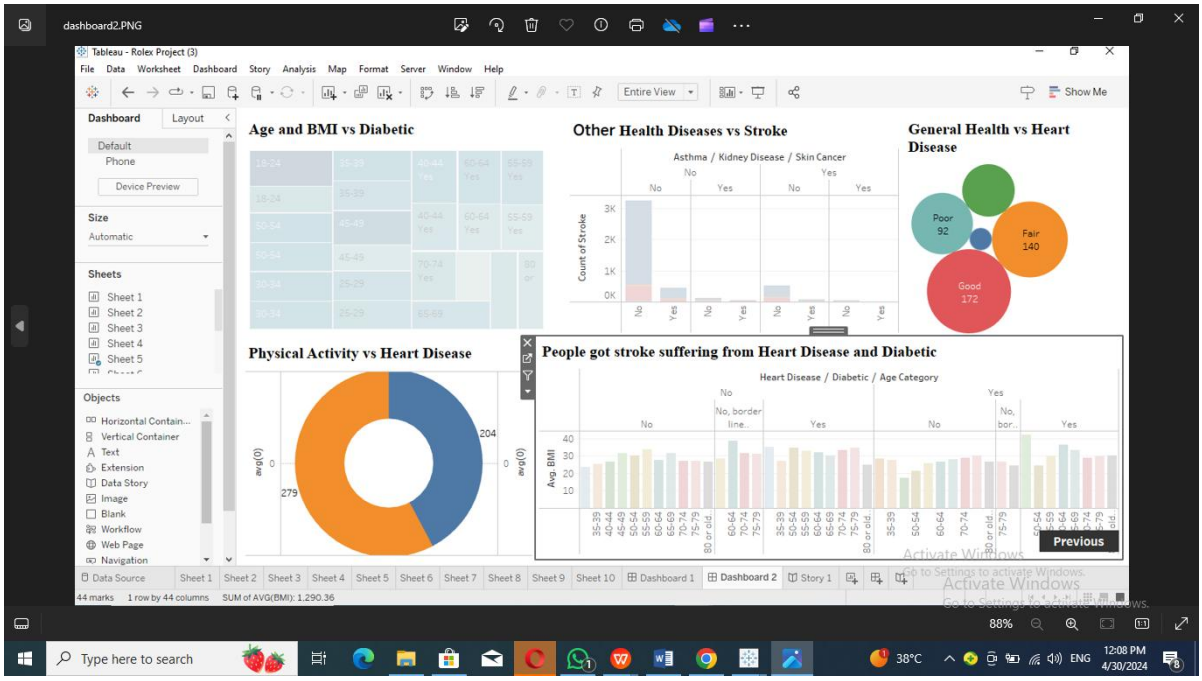
Activity 1- Responsive and Design of Dashboard

Once you have created views on different sheets in Tableau, you can pull them into a dashboard.

DASHBOARD 1



DASHBOARD 2:

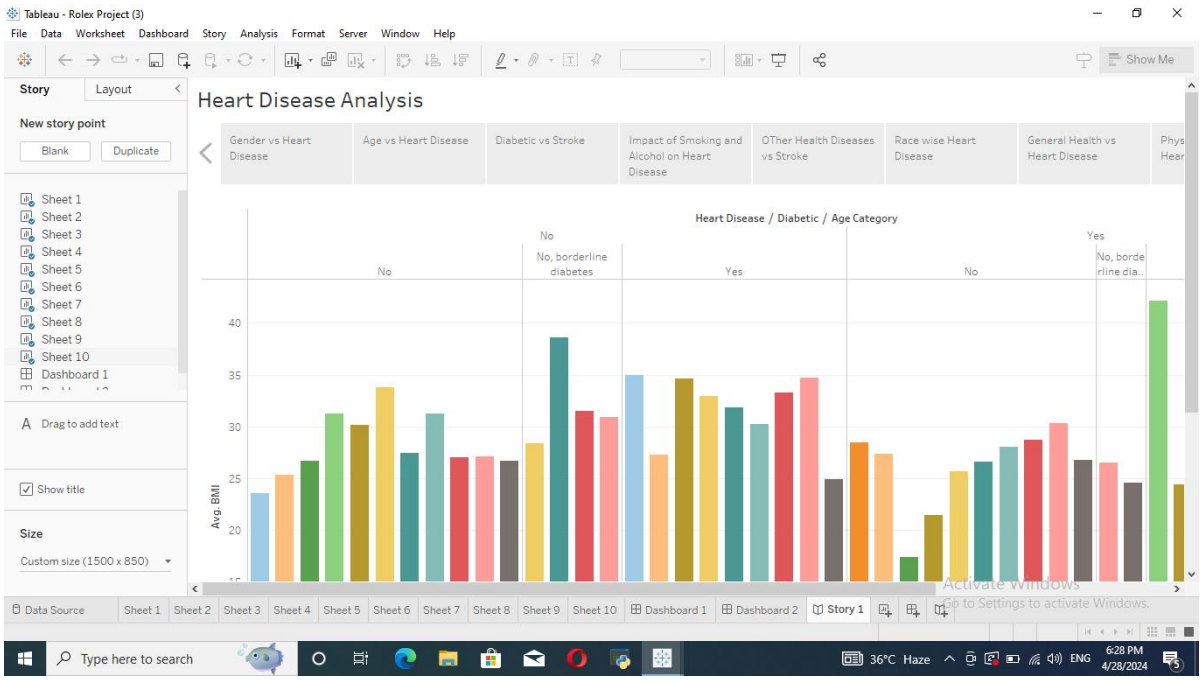


Milestone 6: Story

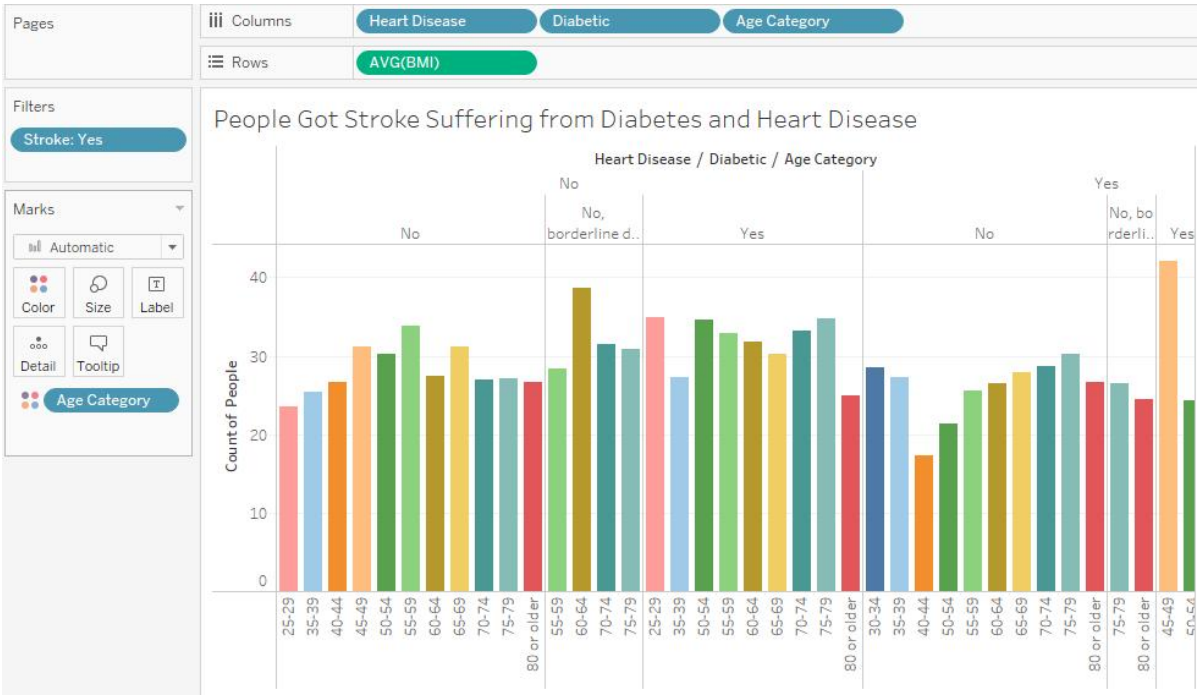
A data story is a way of presenting data and analysis in a narrative format, intending to make the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and analysis logically and systematically, and a conclusion that summarizes the key findings and highlights their implications. Data stories can be told using a variety of mediums, such as reports, presentations, interactive visualizations, and videos.

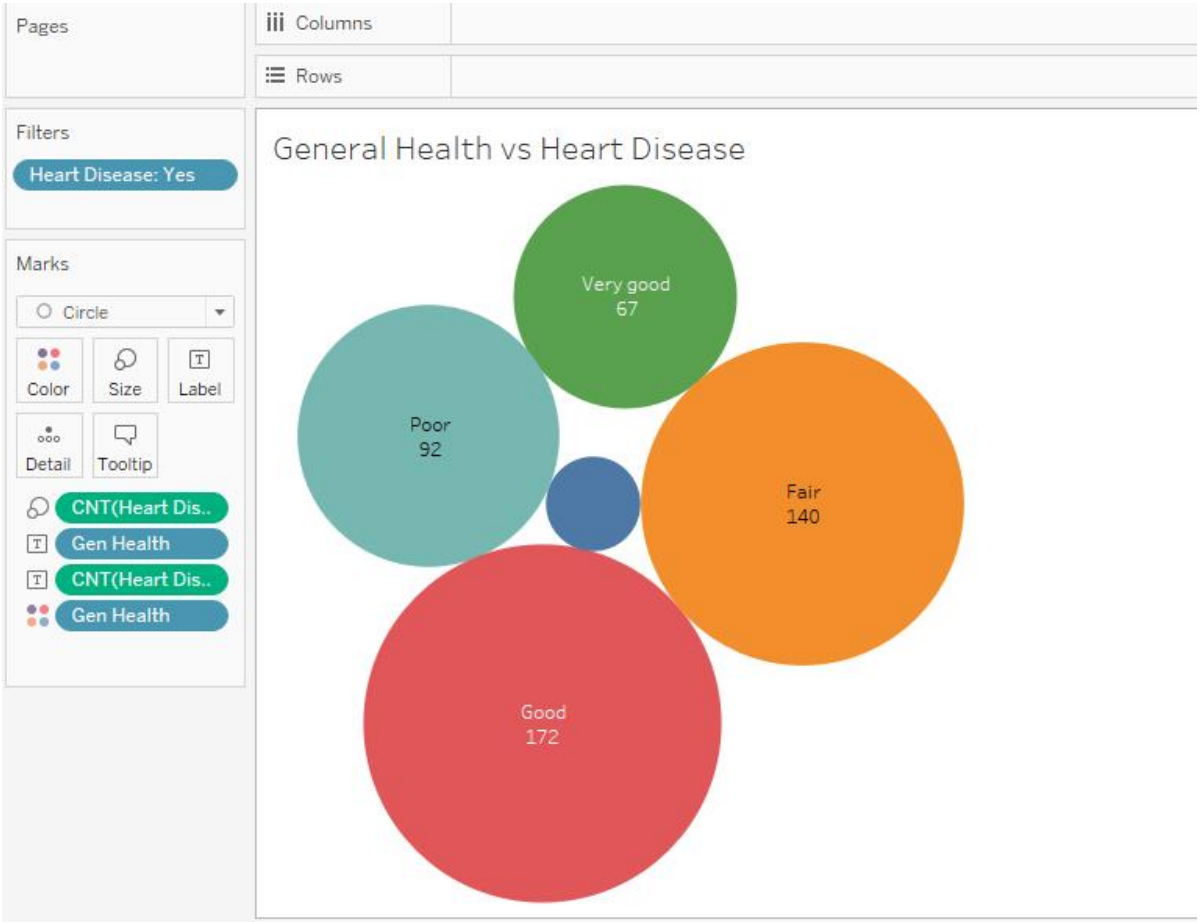
Activity 1- No of Scenes of Story

The number of scenes in a storyboard for a data visualization analysis of the Heart disease will depend on the complexity of the analysis and the specific insights that are trying to be conveyed. A storyboard is a visual representation of the data analysis process and it breaks down the analysis into a series of steps or scenes.



Activity 2: Utilization of Data Filters


Pages
Columns
Heart Disease
Diabetic
Age Category
Rows
AVG(BMI)
Filters
Stroke: Yes
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Age Category
People Got Stroke Suffering from Diabetes and Heart Disease
Heart Disease / Diabetic / Age Category
No
No, borderline d..
Yes
Count of People
0
10
20
30
40
25-29
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
Fair
140
Good
172

Activity 3: No of Calculation Fields

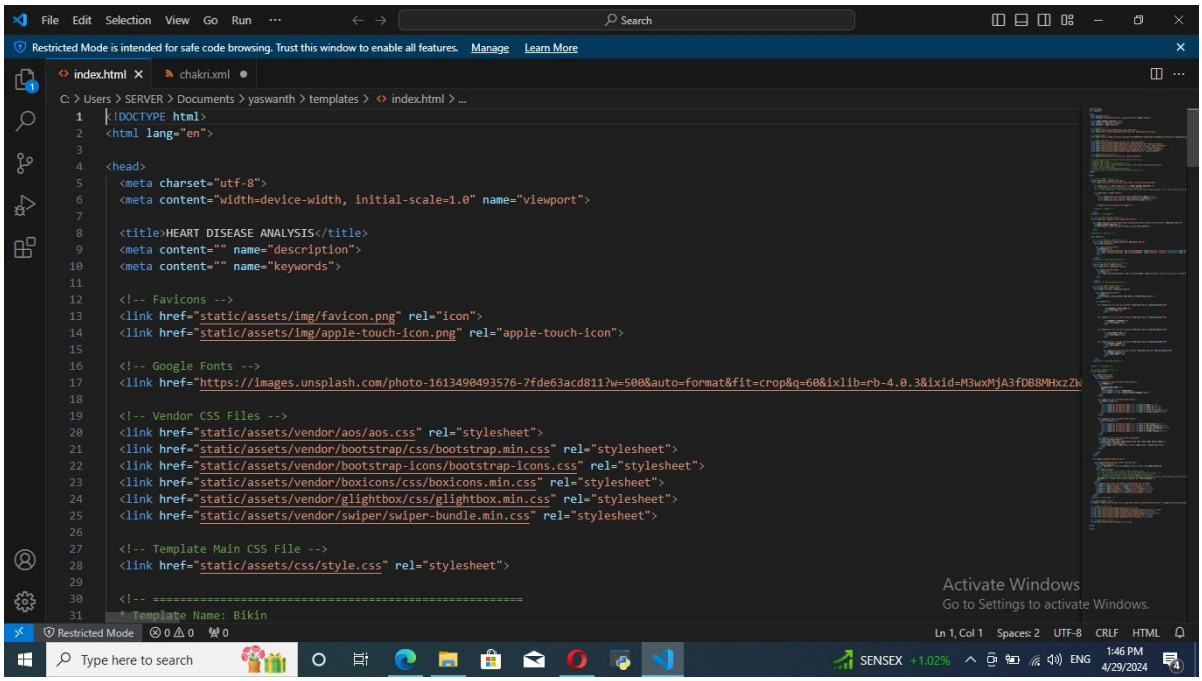
In this analysis we have not created any new column using calculation filed as data found in dataset was clean and sufficient for analysis.

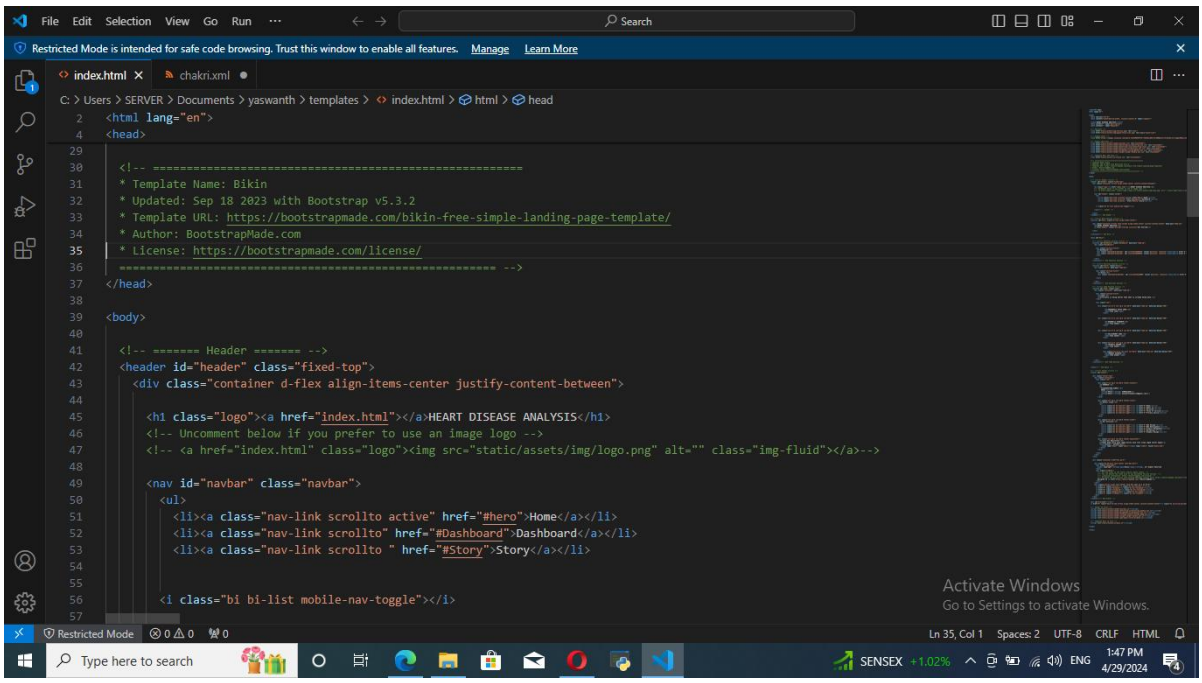
Activity 4: No of Visualizations/ Graphs

1. Gender wise Heart Disease
2. Age wise Heart Disease
3. People Suffering from Diabetic and Stroke
4. Impact of Smoking and alcohol drinking on heart disease
5. Other Diseases vs Stroke
6. Race wise Heart disease
7. General Health vs Heart Disease
8. Physical activity vs heart disease
9. Age and BMI vs Heart disease
10. People got stroke suffering from Diabetes and Heart disease

Milestone 7: 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.

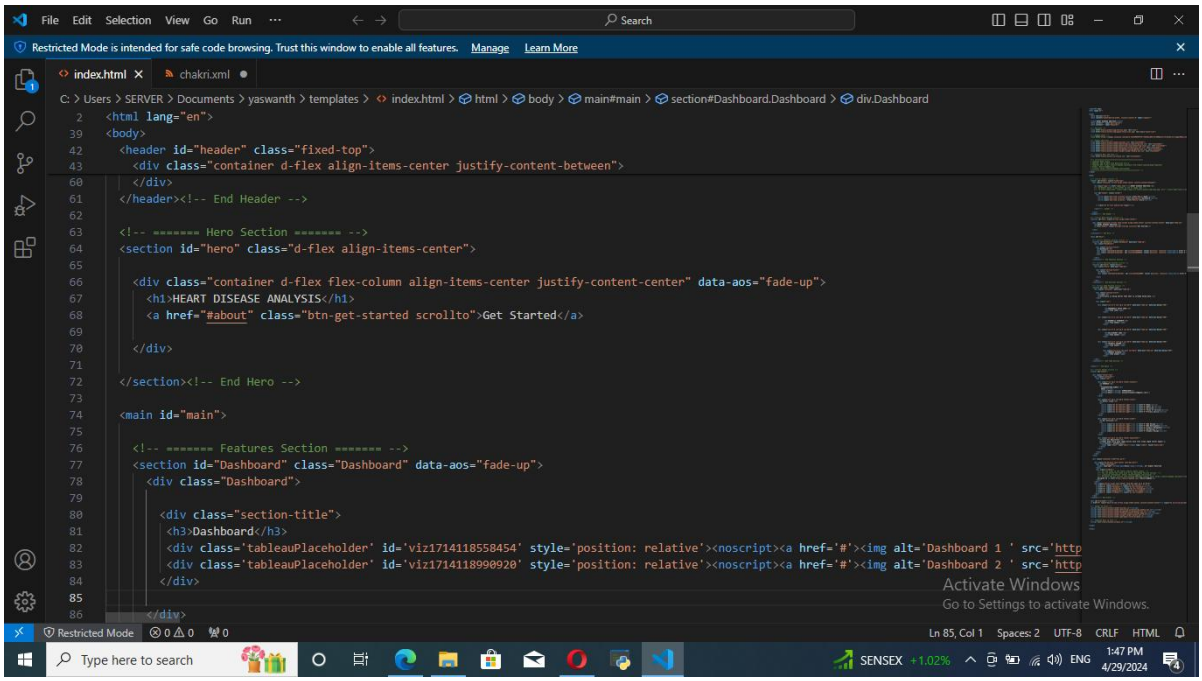

File Edit Selection View Go Run
Search
Restricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
index.html
chakri.xml
C: > Users > SERVER > Documents > yaswanth > templates > index.html > ...
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="utf-8">
<meta content="width=device-width, initial-scale=1.0" name="viewport">
<title>HEART DISEASE ANALYSIS</title>
<meta content="" name="description">
<meta content="" name="keywords">
<!-- Favicons -->
<link href="static/assets/img/favicon.png" rel="icon">
<link href="static/assets/img/apple-touch-icon.png" rel="apple-touch-icon">
<!-- Google Fonts -->
<link href="https://images.unsplash.com/photo-1613490493576-7fde63acd811?w=500&auto=format&fit=crop&q=60&ixlib=rb-4.0.3&ixid=M3wxMjA3fDB8MHxzZW
<!-- Vendor CSS Files -->
<link href="static/assets/vendor/aos/aos.css" rel="stylesheet">
<link href="static/assets/vendor/bootstrap/css/bootstrap.min.css" rel="stylesheet">
<link href="static/assets/vendor/bootstrap-icons/bootstrap-icons.css" rel="stylesheet">
<link href="static/assets/vendor/boxicons/css/boxicons.min.css" rel="stylesheet">
<link href="static/assets/vendor/glightbox/css/glightbox.min.css" rel="stylesheet">
<link href="static/assets/vendor/swiper/swiper-bundle.min.css" rel="stylesheet">
<!-- Template Main CSS File -->
<link href="static/assets/css/style.css" rel="stylesheet">
<!-- ==
* Template Name: Bikin
Activate Windows
Go to Settings to activate Windows.
Restricted Mode
Ln 1, Col 1 Spaces: 2 UTF-8 CRLF HTML
Type here to search
SENSEX +1.02%
ENG
1:46 PM
4/29/2024


File Edit Selection View Go Run
Search
Restricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
index.html
chakri.xml
C: > Users > SERVER > Documents > yaswanth > templates > index.html > html > head
<html lang="en">
<head>
<!-- ==
* Template Name: Bikin
* Updated: Sep 18 2023 with Bootstrap v5.3.2
* Template URL: https://bootstrapmade.com/bikin-free-simple-landing-page-template/
* Author: BootstrapMade.com
* License: https://bootstrapmade.com/license/
== -->
</head>
<body>
<!-- ======= Header ======= -->
<header id="header" class="fixed-top">

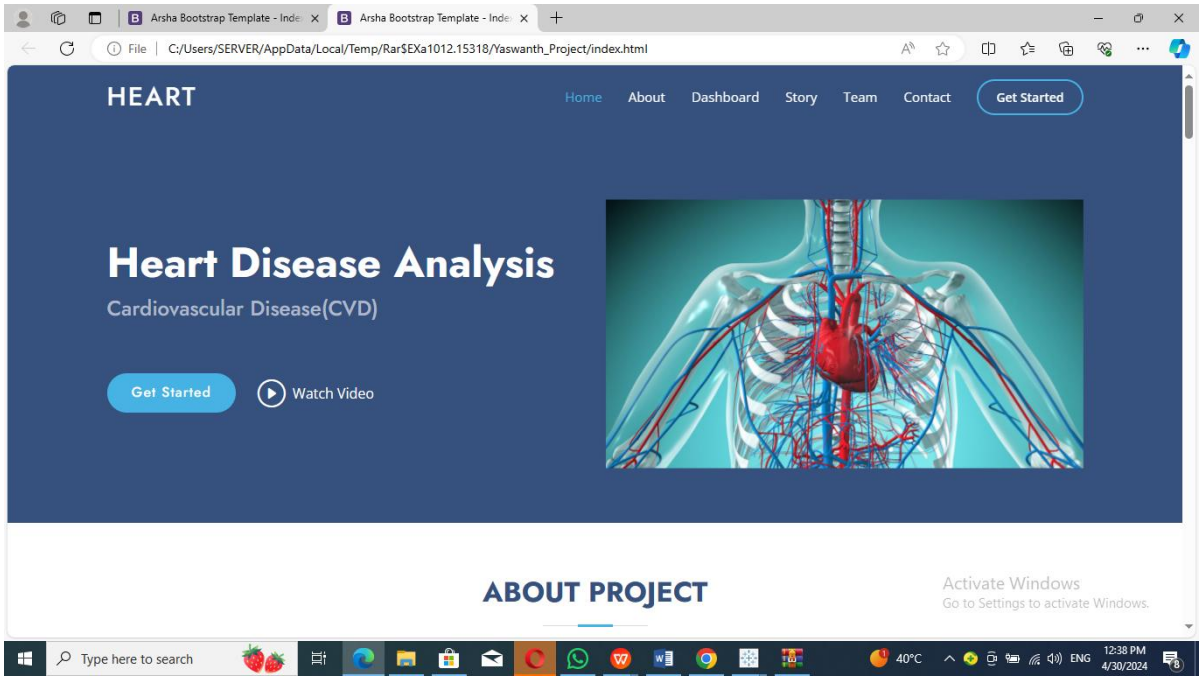
<h1 class="logo">HEART DISEASE ANALYSIS</h1>
<!-- Uncomment below if you prefer to use an image logo -->
<!-- <img src="static/assets/img/logo.png" alt="" class="img-fluid">-->
<nav id="navbar" class="navbar">

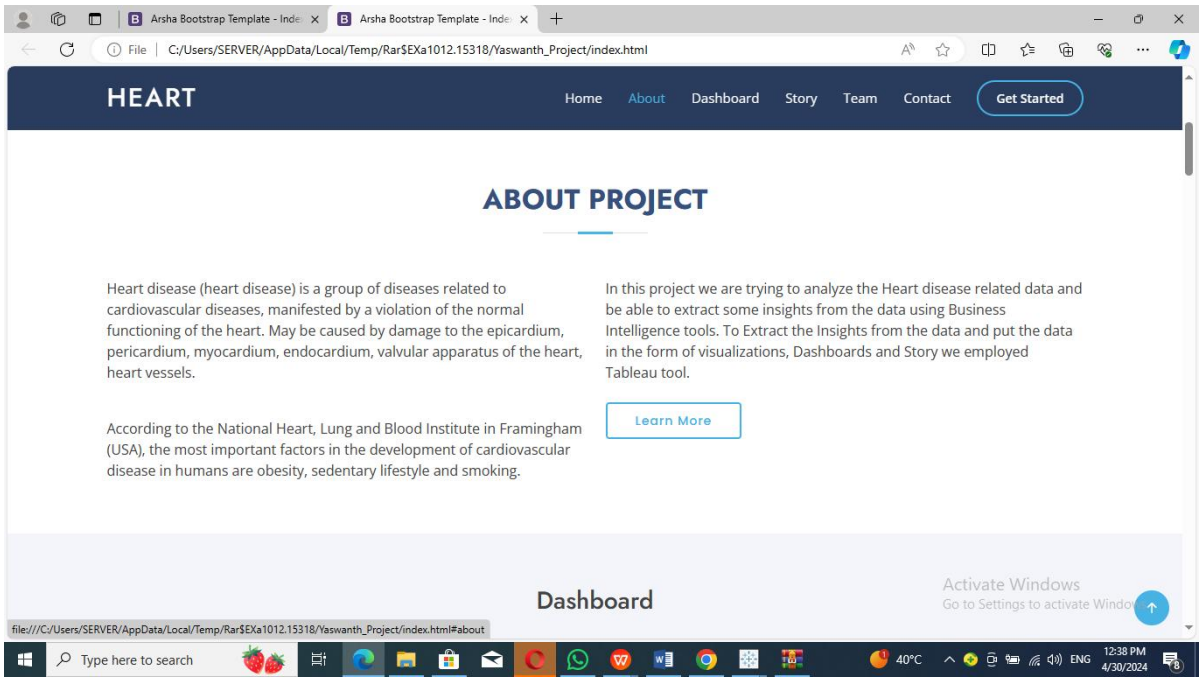
Home
Dashboard
Story

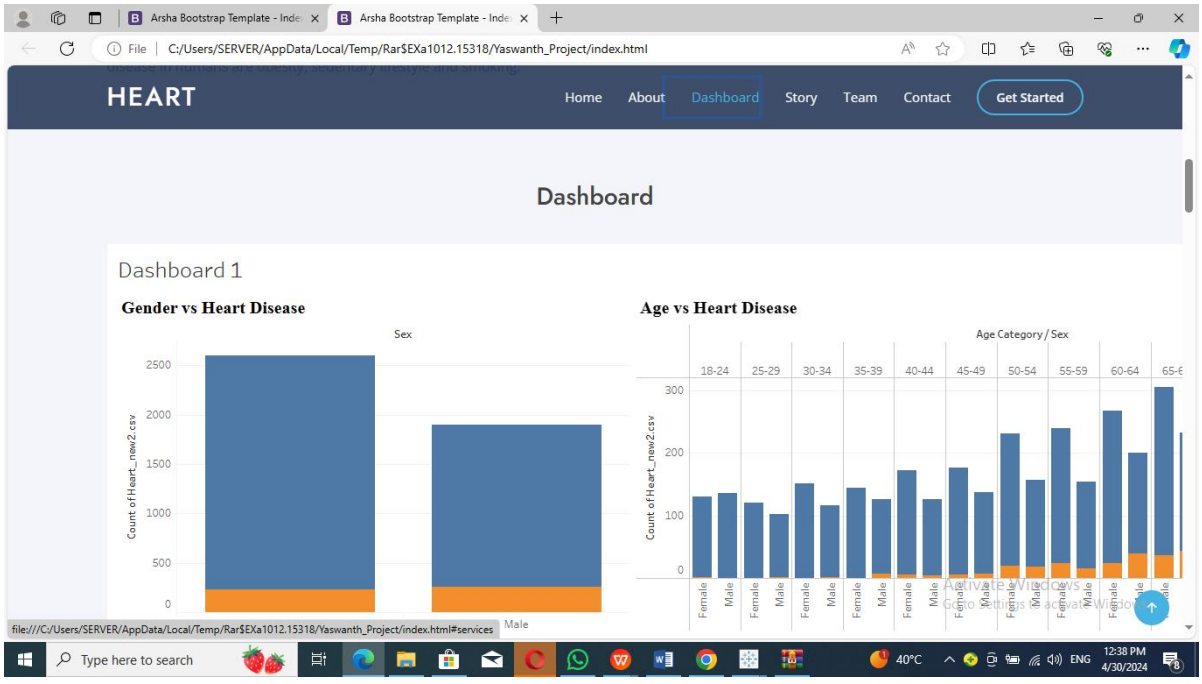
Activate Windows
Go to Settings to activate Windows.
Restricted Mode
Ln 35, Col 1 Spaces: 2 UTF-8 CRLF HTML
Type here to search
SENSEX +1.02%
ENG
1:47 PM
4/29/2024

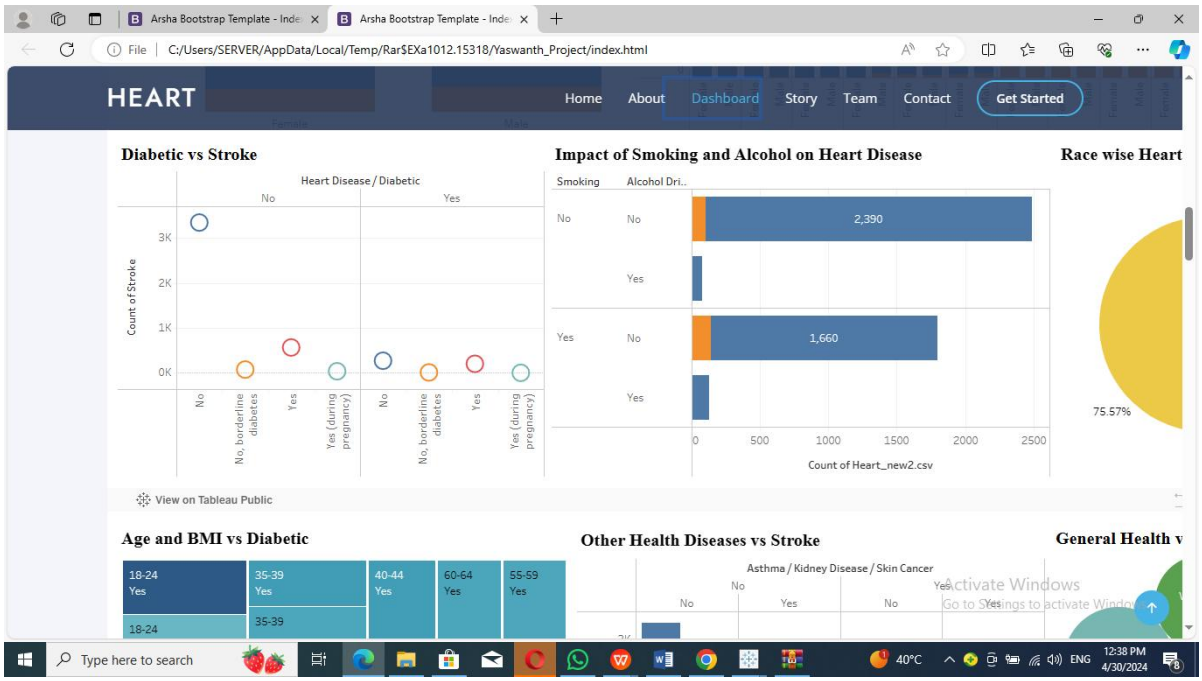


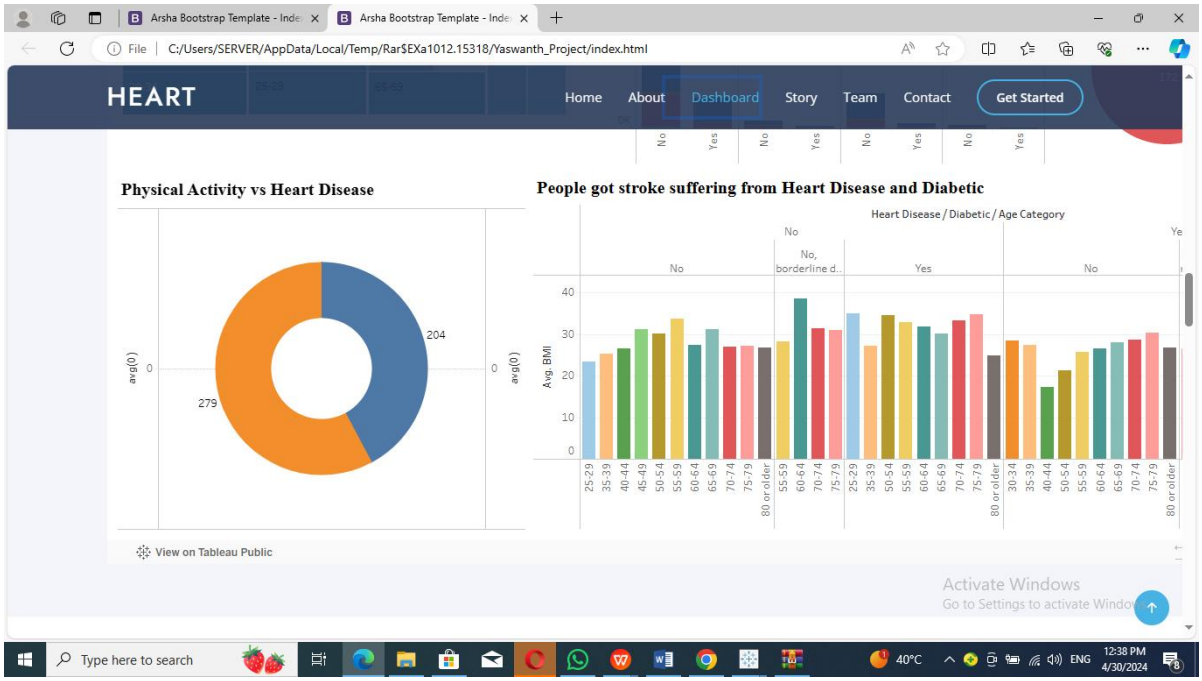
Activity 1: Embed Dashboard & Story with Flask

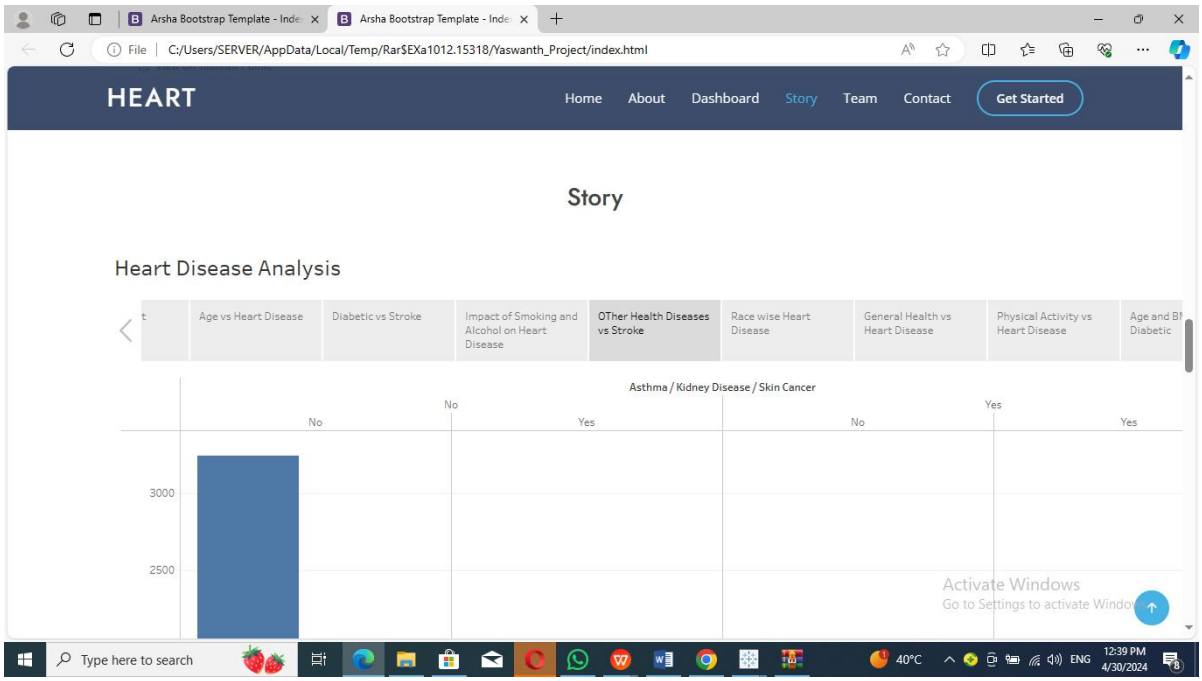


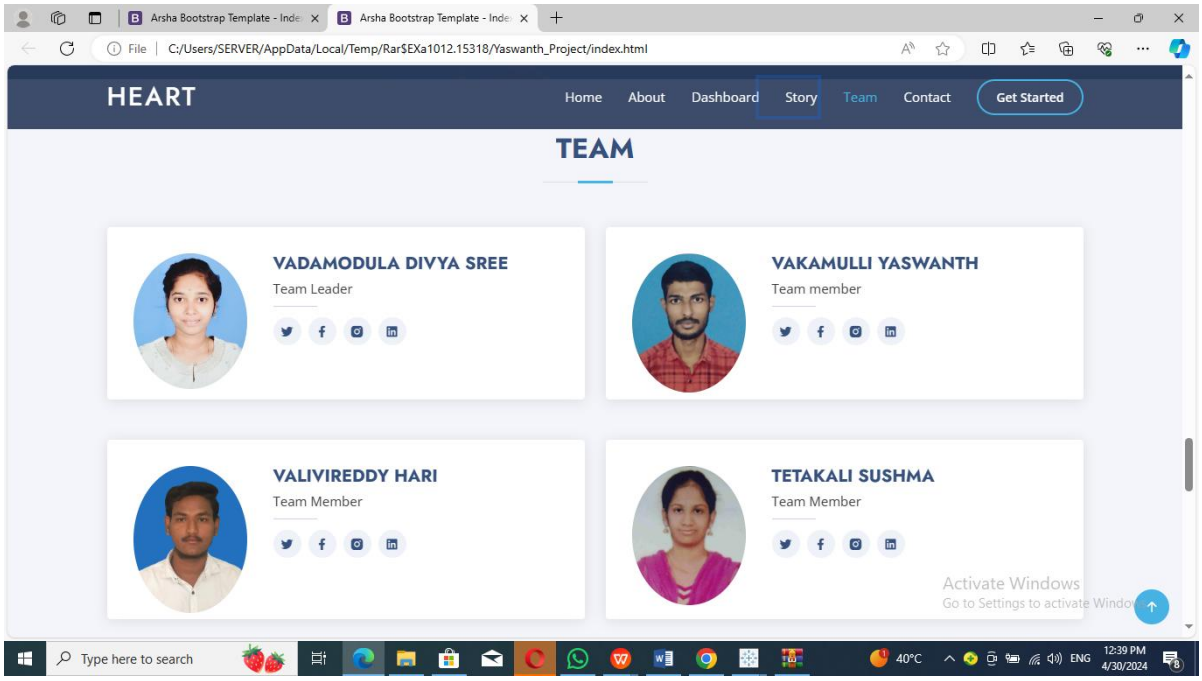

Arsha Bootstrap Template - Inde
Arsha Bootstrap Template - Inde
File | C:/Users/SERVER/AppData/Local/Temp/Rar$EXa1012.15318/Yaswanth_Project/index.html
HEART
Home
About
Dashboard
Story
Team
Contact
Get Started
ABOUT PROJECT
Heart disease (heart disease) is a group of diseases related to cardiovascular diseases, manifested by a violation of the normal functioning of the heart. May be caused by damage to the epicardium, pericardium, myocardium, endocardium, valvular apparatus of the heart, heart vessels.
According to the National Heart, Lung and Blood Institute in Framingham (USA), the most important factors in the development of cardiovascular disease in humans are obesity, sedentary lifestyle and smoking.
In this project we are trying to analyze the Heart disease related data and be able to extract some insights from the data using Business Intelligence tools. To Extract the Insights from the data and put the data in the form of visualizations, Dashboards and Story we employed Tableau tool.
Learn More
Dashboard
Activate Windows
Go to Settings to activate Windo
file:///C:/Users/SERVER/AppData/Local/Temp/Rar$EXa1012.15318/Yaswanth_Project/index.html#about
Type here to search
40°C
ENG
12:38 PM
4/30/2024


Arsha Bootstrap Template - Inde
Arsha Bootstrap Template - Inde
File | C:/Users/SERVER/AppData/Local/Temp/Rar$EXa1012.15318/Yaswanth_Project/index.html
HEART
Home
About
Dashboard
Story
Team
Contact
Get Started
Dashboard
Dashboard 1
Gender vs Heart Disease
Sex
Count of Heart_new2.csv
2500
2000
1500
1000
500
0
Male
Age vs Heart Disease
Age Category / Sex
18-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
Count of Heart_new2.csv
300
200
100
0
Female
Male
Activate Windows
Go to Settings to activate Windows
file:///C:/Users/SERVER/AppData/Local/Temp/Rar$EXa1012.15318/Yaswanth_Project/index.html#services
Type here to search
40°C
ENG
12:38 PM
4/30/2024


Arsha Bootstrap Template - Inde
Arsha Bootstrap Template - Inde
File | C:/Users/SERVER/AppData/Local/Temp/Rar$EXa1012.15318/Yaswanth_Project/index.html
HEART
Home
About
Dashboard
Story
Team
Contact
Get Started
Diabetic vs Stroke
Heart Disease / Diabetic
No
Yes
Count of Stroke
3K
2K
1K
0K
No
No, borderline diabetes
Yes
Yes (during pregnancy)
Impact of Smoking and Alcohol on Heart Disease
Smoking
Alcohol Dri..
2,390
1,660
0
500
1000
1500
2000
2500
Count of Heart_new2.csv
Race wise Heart
75.57%
View on Tableau Public
Age and BMI vs Diabetic
18-24
35-39
40-44
60-64
55-59
Yes
Other Health Diseases vs Stroke
Asthma / Kidney Disease / Skin Cancer
General Health v
Activate Windows
Type here to search
40°C
ENG
12:38 PM
4/30/2024


Arsha Bootstrap Template - Inde
Arsha Bootstrap Template - Inde
File | C:/Users/SERVER/AppData/Local/Temp/Rar$EXa1012.15318/Yaswanth_Project/index.html
HEART
Home
About
Dashboard
Story
Team
Contact
Get Started
Physical Activity vs Heart Disease
avg(0)
204
279
People got stroke suffering from Heart Disease and Diabetic
Heart Disease / Diabetic / Age Category
No
No, borderline d..
Yes
Avg. BMI
40
30
20
10
0
25-29
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80 or older
30-34
View on Tableau Public
Activate Windows
Type here to search
40°C
ENG
12:38 PM
4/30/2024


Arsha Bootstrap Template - Inde
Arsha Bootstrap Template - Inde
File | C:/Users/SERVER/AppData/Local/Temp/Rar$EXa1012.15318/Yaswanth_Project/index.html
HEART
Home
About
Dashboard
Story
Team
Contact
Get Started
Story
Heart Disease Analysis
Age vs Heart Disease
Diabetic vs Stroke
Impact of Smoking and Alcohol on Heart Disease
OTher Health Diseases vs Stroke
Race wise Heart Disease
General Health vs Heart Disease
Physical Activity vs Heart Disease
Asthma / Kidney Disease / Skin Cancer
No
Yes
No
Yes
3000
2500
Activate Windows
Type here to search
40°C
ENG
12:39 PM
4/30/2024


Arsha Bootstrap Template - Inde
Arsha Bootstrap Template - Inde
File | C:/Users/SERVER/AppData/Local/Temp/Rar$EXa1012.15318/Yaswanth_Project/index.html
HEART
Home
About
Dashboard
Story
Team
Contact
Get Started
TEAM
VADAMODULA DIVYA SREE
Team Leader
VAKAMULLI YASWANTH
Team member
VALIVIREDDY HARI
Team Member
TETAKALI SUSHMA
Team Member
Activate Windows
Type here to search
40°C
ENG
12:39 PM
4/30/2024