

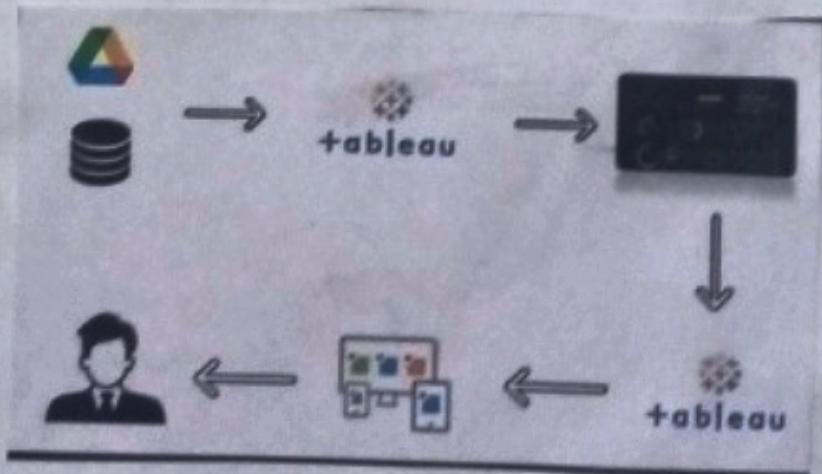
HEART DISEASE ANALYSIS

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, endocardium, 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 this project we are trying to analyze the heart disease related data and able to extract some insights from data using business intelligence tools. To extract the insights from the data and put 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

- Define Problem
 - Specify business problem
 - Business requirements
 - Literature Survey
 - Social or business Impact
- Data Collection & Extraction from Database
 - collect 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
 - Response and Design of dashboard
- Story
 - No. of scenes of story
- Performance Testing
 - Amount of Data Rendered to DB
 - Utilization of Data filters
 - No. of calculations
 - 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.

Milestone 1 : Define Problem

Activity 1 : Specify business problem

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

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 underutilized. Using this huge amount of data, a disease can be detected, predicted or even cured. The business requirements for analyzing heart disease would include identifying pattern and comparing factors of heart disease, creating interactive dashboards and reports, making data driven decisions, comparing to current situation. The ultimate goal is to gain insights and improve performance through data visualizations technique.

Activity 3 : Literature Survey

A literature survey for heart disease would involve researching and reviewing previous studies, articles, and reports on topic. A comprehensive literature survey should include peer-reviewed journals, scientific databases

conference proceedings, and authoritative sources in field of cardiovascular medicine. The survey should encompass a range of studies, including clinical trials, systematic reviews, and meta-analyses, to provide a comprehensive overview of current knowledge landscape in field of heart disease.

Activity 4: Social Impact

Analyzing heart disease has profound social impacts, ranging from individual level health outcomes to community empowerment and public health initiatives. Heart Disease analyzes plays a crucial role in improving well-being and improving well-being of individuals and society as a whole.

Business Model:

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, drive innovation, and influence 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 data.

Activity 1.1:

Understand the data

Data contains all the meta informations regarding the columns described in the csv file

Description of the Dataset:

1. Heart Disease - target trait
 - females suffering from mental health are also suffering from heart disease nearly 1522 females population are suffering from both.
 - 1074 men are suffering from heart disease who are also suffering from mental health.
2. BMI - Body Mass Index is a value that indicate a person mass and weight and judge whether the mass is insufficient or sufficient, or excessive.
 - ⇒ Here, we found that people who are underweight and obesity are suffering from heart disease.
 - ⇒ Sufficient BMI counts as healthy and low

risk of heart disease.

3. Smoking:

It is a major risk factor for cardiovascular disease. When smoke from cigarette is inhaled the function of cardiovascular system and changes upto 30% within 10 minutes of smoking.

→ As per analysis out of every 50% of population who smoke suffers from heart disease.

4. Alcohol Drinking:

alcohol cause not only temporary disturbance in functioning of heart but also permanent ones.

→ Overall 65% people suffer from heart disease who consume alcohol.

5. Stroke:

- Ischemic stroke occurs 4 times more than hemorrhage, because of suffering from heart disease.
- people having count of heart +1 suffer from a stroke.

6. Physical Health:

- Averagely people suffering from heart disease suffer from low physical health day i.e., averagely 3.3 days in a week.

7. Mental Health:

- Out of 7 days a week people suffering from heart issues suffer 4.3 days from poor mental health.

Sex :

- As per the analysis men suffers more than female from heart disease.
- Women are at higher risk of stroke but at older age.

Age Category :

- Younger people ranging from 18-34 are likely to have lower risk of heart disease.
- Mostly men from 45 and older have high chance of heart disease.
- Women after 55 and older can suffer from heart disease.

Diabetic: People who are diagnosed with diabetic have twice as likely to suffer from heart disease than normal people who are healthy.

Physical Activity : adults who reported to have physical activity or exercise has less percentage to suffer from heart disease.

Sleep Time:

- People suffering from health disease has a rate of 45% to increase insomnia.

Asthma:

- Nearly 533(15%) people had diagnosed of asthma who developed heart disease.

Kidney Disease:

- 26% people who are diagnosed with kidney issue get their heart effected increasing the chance of heart disease.

Activity 2: Storing Data in DB & performs SQL operations

- We will store the data in form of rows and columns, it is stored in data pages in defined size.

Activity 3: Connect DB with Tableau

The database can be connected to Tableau by connecting the database server.

Milestone 3: Data Preparation

Activity 1: Prepare the Data for Visualization

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming data into format that can be easily visualized, exploring data to identify patterns and trends, filtering data to focus on specific subsets of data, preparing the data for visualization software, and the ensuring data is accurate and complete.

This helps to make data easily understandable and ready for creating visualizations to gain insights into performance and efficiency. Since the data is already cleaned we can move to visualization.

Milestone 4 : Data Visualization

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

Activity 1 : No. of Unique Visualization

The no. 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 bank include bar charts, line charts, graphs, maps, scatter plots, pie charts, etc.

Activity 1.1 : Gender vs Heart Disease

Activity 1.2 : Age vs Heart

Activity 1.3 : Diabetes vs stroke

Activity 1.4 : Impact of Smoking & Alcohol on Heart Disease

Activity 1.5 : Other health disease 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

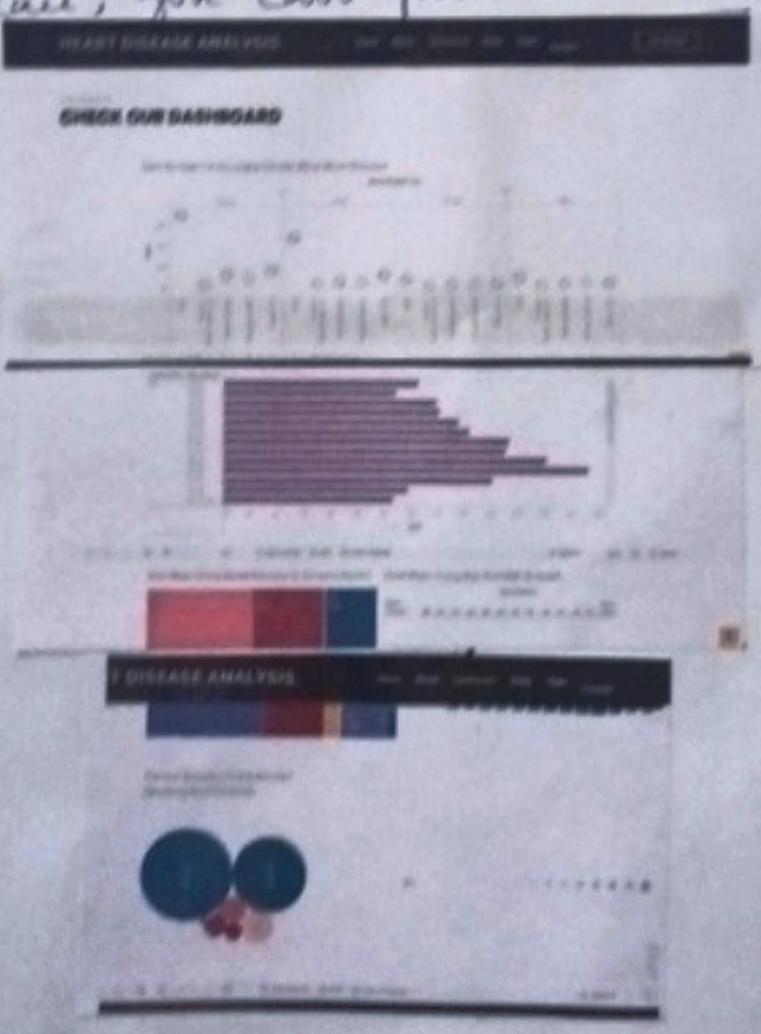
Activity 1.9 : Age & BMI

Milestone 5 Dashboard

A dashboard is a graphical user interface that displays information and data in an organised, easy to read format. Dashboards are often used to provide real time monitoring and analysis of data and are typically designed for specific purpose. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in form of charts, graphs & tables.

Activity 1 Responsive and Design of Dashboard

Once you have created views on different sheet in tableau, you can pull them into dashboard.

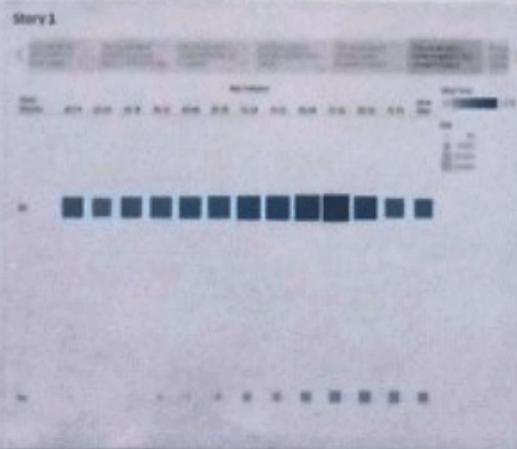


Milestone 6 : Story

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 context for the data, a body that presents the data analysis logically and systematically, and a conclusion that summarizes key findings and highlights their implications.

Activity 1 - No. of Scenes of Story

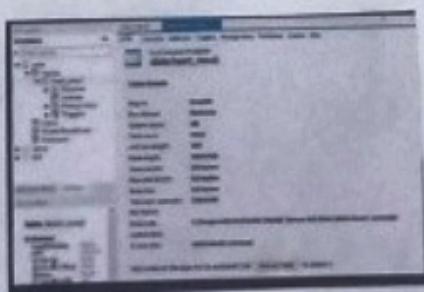
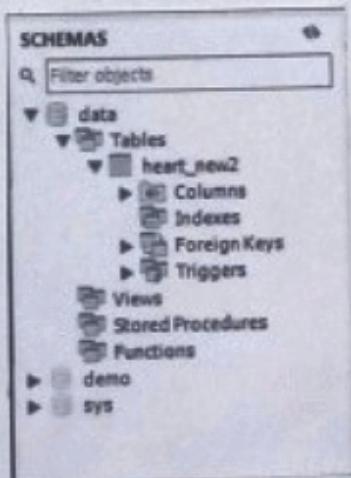
The no. of scenes in storyboard for a data visualization analysis of heart disease will depend on complexity of analysis and the specific insights that are trying to be conveyed.



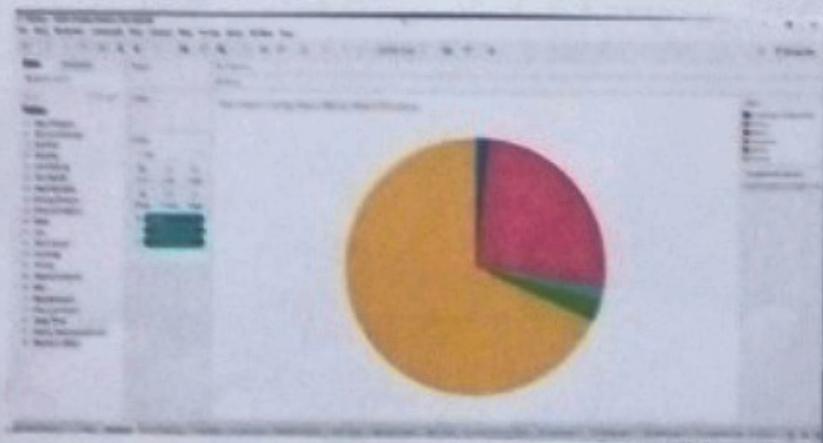
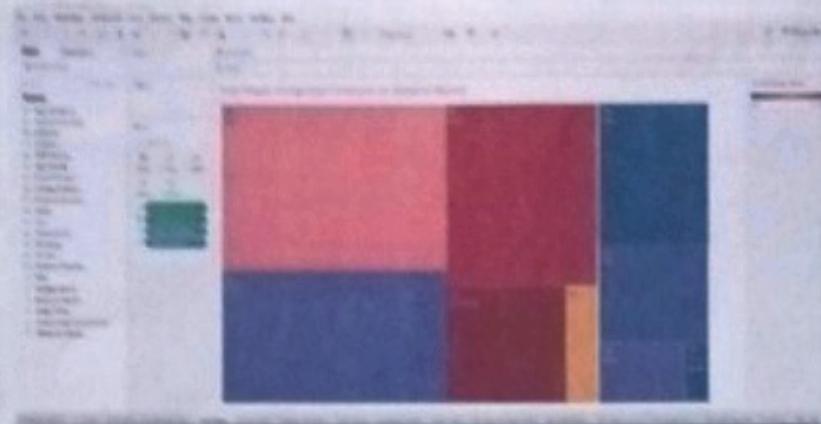
Milestone 7: Performance Testing

Activity 1: Amount of Data rendered of DB

- The amount of data that is rendered to a database depends on the size of dataset and the capacity of dataset to store and retrieve data.
- Open the MySQL workbench, go to dataset then click to expand table, select table and click on info button to get info such as column count, table rows etc.



Activity 2 : Utilization of Data filters.



Activity 3 : No. of Calculation fields

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

Activity 4 : No. of 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
5. Other Diseases vs Stroke
6. Race wise heart disease

Milestone 8

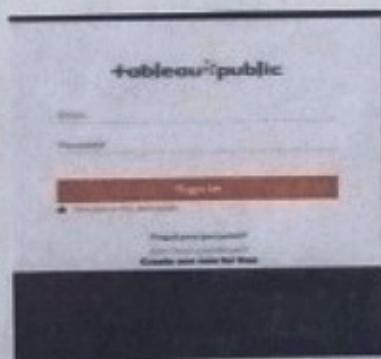
Web Integration

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 share button on top ribbon

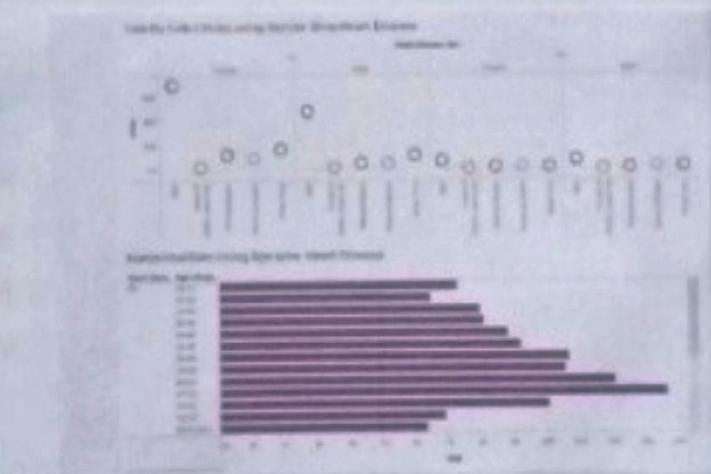
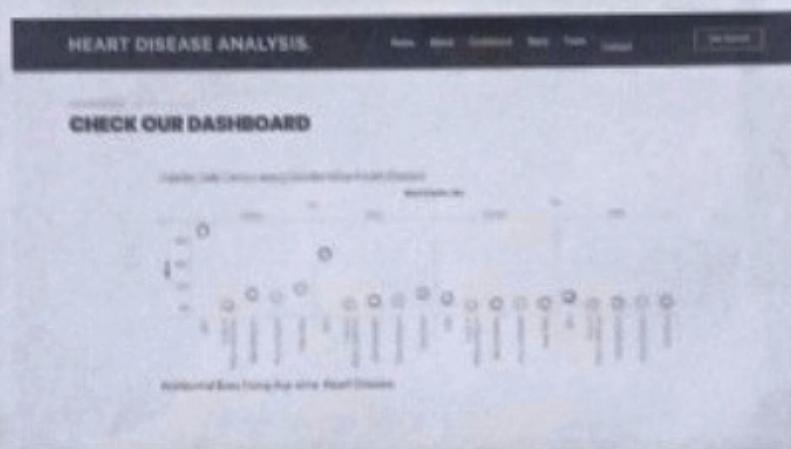
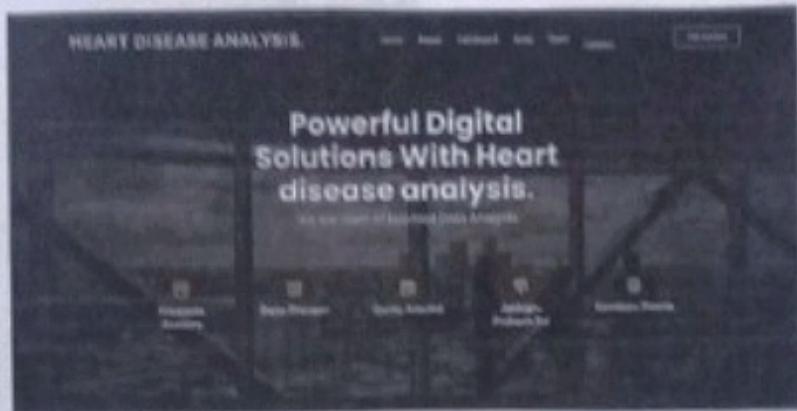
Step 2 : Once you click on connect it will ask you for tableau public username and password.

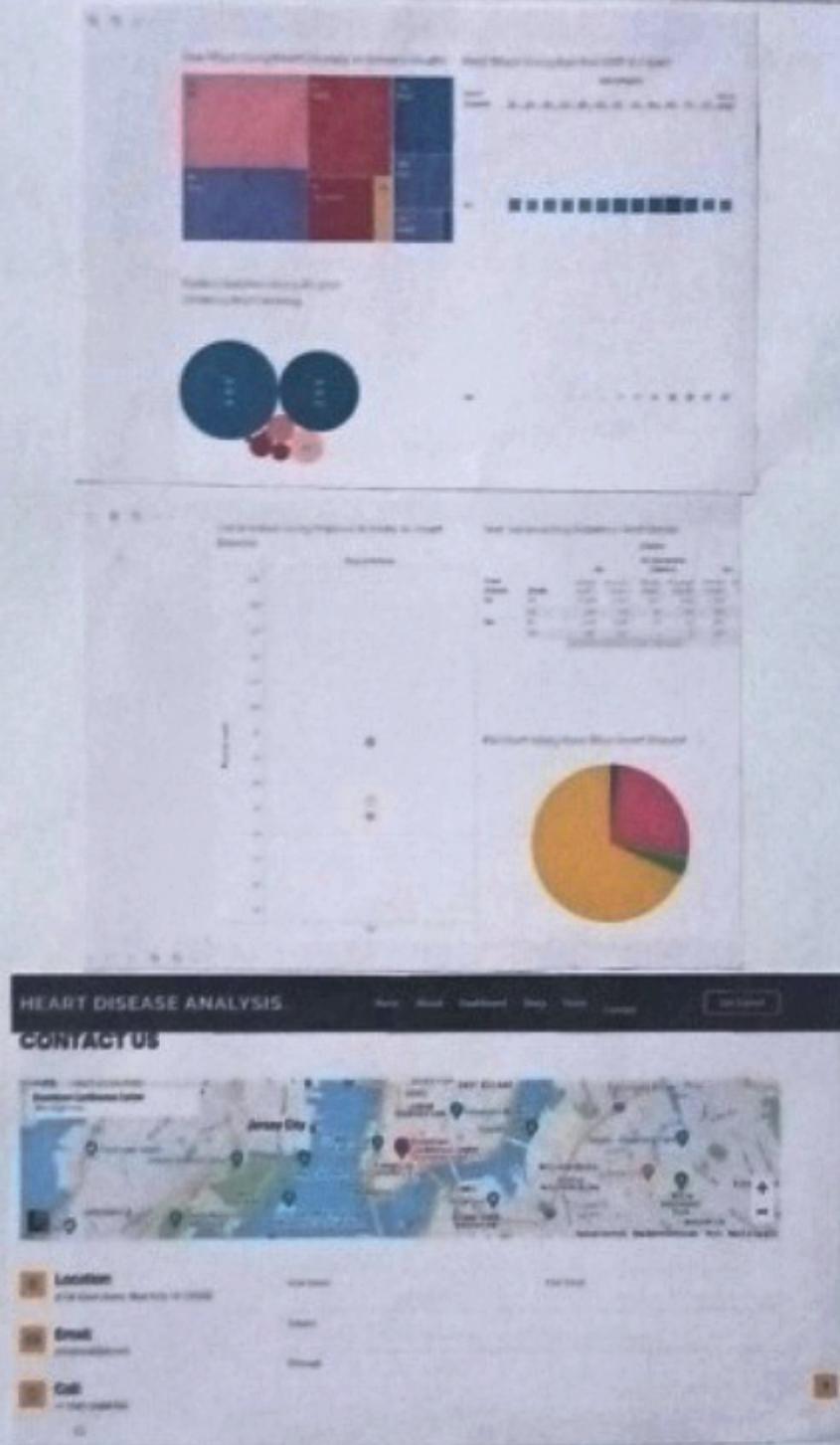


Once you begin your tableau public using credentials, the particular visualization will be published into tableau public

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

Activity 1: Embed Dashboard & Story with flask





Milestone 1: Project Demonstration & Documentation

Activity 1: Record explanation Video for the projects end to end solution

Activity 2: Project Documentation step by step project development procedure.

LONG-TERM INTERNSHIP