WEB VISUALIZER

A Project Work

Submitted in Partial fulfillment for the award of

Graduate Degree of Bachelor of Technology (B.Tech.)
In
Computer Science & Engineering
(Session: 2022-23)

Submitted By

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Enroll No: 0205CS191086

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Enroll No: 0205CS191110

Under the Guidance of

Prof. ……………………

(Computer Sc. & Engg.)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SHRI RAM INSTITUTE OF TECHNOLOGY, JABALPUR (M.P.)
RAJEEV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL (M.P.)

SHRI RAM INSTITUTE OF TECHNOLOGY
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CERTIFICATE

This is to certify that

Vishal Dangiwala (0205CS191122)
Rajul Koshta (0205CS191086)
Sourabh Soni (0205CS191110)

*students of 8th semester, Computer Sc. & Engg. S.R.I.T., Jabalpur have duly completed their final year project entitled **"Web Visualizer"** for the partial fulfillment of the requirement for the degree of Bachelor of Technology as per R.G.P.V., Bhopal.*

They have successfully implemented and tested this project, which meets all the requirements specified under my guidance.

Mr. Brajesh Patel.	*Mr. Brajesh Patel.*	*Dr. Shailesh Gupta*
(Project Guide)	*(H.O.D.)*	*(Principal)*
Computer Sc & Engg	*Computer Sc. & Engg*	*SRIT, Jabalpur*
Dept, SRIT	*Dept, SRIT*	

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

Date: **Date:**

PREFACE

I am still working on the project

"***WEB VISUALIZER"*** for more possible outcomes and enhancement of project. For this we have gone through the entire requirements and many resources keeping the objective of the project. The web is ever expanding with each passing day, but these machine learning algorithms are rarely known to the user if they are not listed in the search results of search engines.

Data analytics will help the many people, firms and MNC,s for scaling their business in competitive world, this technology works on the user's requirement and give the beneficial result for us.

Data Analytics will give the result in a pictorial form as well as in graph manner so that the business world will easily understand the user's requirement, their emotions, and satisfaction related to service.

Sustainability data focuses on resource utilization, including how much energy, water, materials, and waste are you using or generating, how much time you are allocating to your efforts, and how much money you are saving or spending on those efforts.

By using visualization on sustainability data will helps us to utilize less resource and as well as require less human cost and resource.

We are also applying search engine techniques for optimizing present on a website, so that the web-crawlers crawling the web, index the websites so that it is properly indexed and displayed in search of a search engine.

And also, we are maintaining our database for our convenience.

ACKNOWLEDGMENT

First of all, We thank the *GOD* who is constantly showering his blessing and love on us.

As one can accomplish nothing, this project is also not an exception. I would like to have some space to acknowledge some of them that frequently fade into the background during the course of our project work; We got help, advice, suggestions, and cooperation from many people. Some influenced us, some inspired us, and some helped us in completing our project work.

It is our great privilege; pride and honour in expressing our deepest sense of gratitude to my esteemed inspiring, mentor Mr. Brajesh Patel in presenting this project is entitled “Web Visualizer”, his/her constant inspiration, memorable guidance, innovative ideas, at various stages, and above all his/her untiring valuable support have brought out this project to exquisite workmanship and great success.

We express our profound and sincere gratitude to Mr. R. Karsoliya (Chairman) Shri Ram Institute of Technology, Jabalpur (M.P.), affiliated to Rajiv Gandhi Technical University, Bhopal, (M.P.) for providing facilities needed in connection with our project work.

We express our gratitude to Dr. Shailesh Gupta Principal, Mr. Brajesh Patel (HOD CSE), Mr. Deepak S. Rajpoot (A.P), Dr. Ruchi K. Patel (A.P.), Mr. Sandeep Rao for their support and help we received from him throughout this project work and encouragement to carry out this project.

Vishal Dangiwala(0205CS191122)

Rajul Koshta(0205CS191086)

Sourabh Soni(0205CS191110)

DECLARATION

We hereby declare that the work on "***Web Visualizer"*** is solely an effort raised by us, and all the external libraries that are used in the project had permission to be freely used and modified in any form. No copyright or rules violation has been done in bringing out the project to the face of users.

Further proper credits to any external sources of help, have been included in the Acknowledgement.

Place: Jabalpur

Vishal Dangiwala
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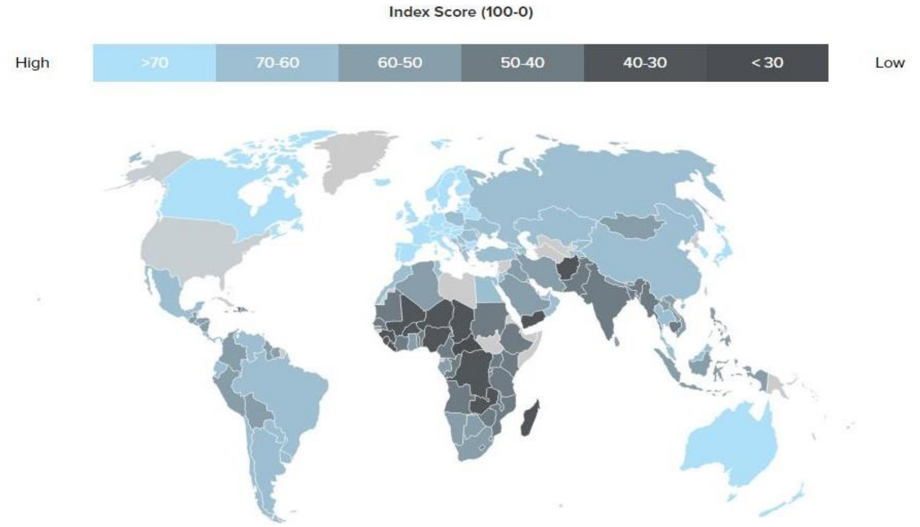
INTRODUCTION

INTRODUCTION

Information visualization, an emerging discipline, uses visual means to represent nonspatial, abstract data. To visualize such information, you must map this data into a physical space. Finding the appropriate visual mapping for the task at hand proves vital to producing effective visualizations. Information visualization can often help you find and understand relationships and structure within (seemingly) unstructured data. Recent widespread interest has focused on exploration of information visualization techniques and applications for just that reason. At the same time, information has become pervasive thanks to underlying mechanisms such as the World Wide Web (WWW) and corporate intranets. Visualizing Web- based information—either from the WWW or intranets—has become a common application of information visualization

the Web has naturally progressed as a source of information as well as an underlying delivery mechanism for interactive information visualization. To further explore these ideas, developers use tools such as Virtual Reality Modeling Language (VRML), Java, and Web browsers such as Netscape to create Web- based information visualization applications. While a Web-based delivery mechanism offers a number of advantages, it also imposes a number of limitations and problems.



A fundamentally new medium for visualization, the Web is changing the way visualization applications are developed, delivered, and used. We have developed a number of Web-based information visualization prototypes and applications by adapting several well-known information visualization ideas and techniques for use within Web environments. Before delving into specific examples, we offer some relevant background about the Web and our use of visualization for analysis.

In adapting visualization techniques for use in Web environments, we employ several common development tools, including VRML as a 3D graphics engine and standard Web interfaces such as Netscape for formatted text browsing. Currently, Hypertext Markup Language, or HTML, remains a common standard for providing formatted, interlinked text. Common Gateway Interface, or CGI, provides a method for interfacing Web tools with external gateway programs. These simple Web-based navigation and modeling tools permit using hyperlinks and CGI-triggered database queries to interlink related data and information. In addition, integrating Java with these tools enables the development ofinteractive, distributed Web applications.

The availability and access to high-quality, timely, disaggregated and reliable data is fundamental to the successful implementation and monitoring of the 2030 Agenda. Citizen-generated data, as well as data produced by such constituencies as the private sector and local authorities, faces complex challenges in being integrated and used to support monitoring and decision- making to accelerate implementation of the 2030 Agenda.

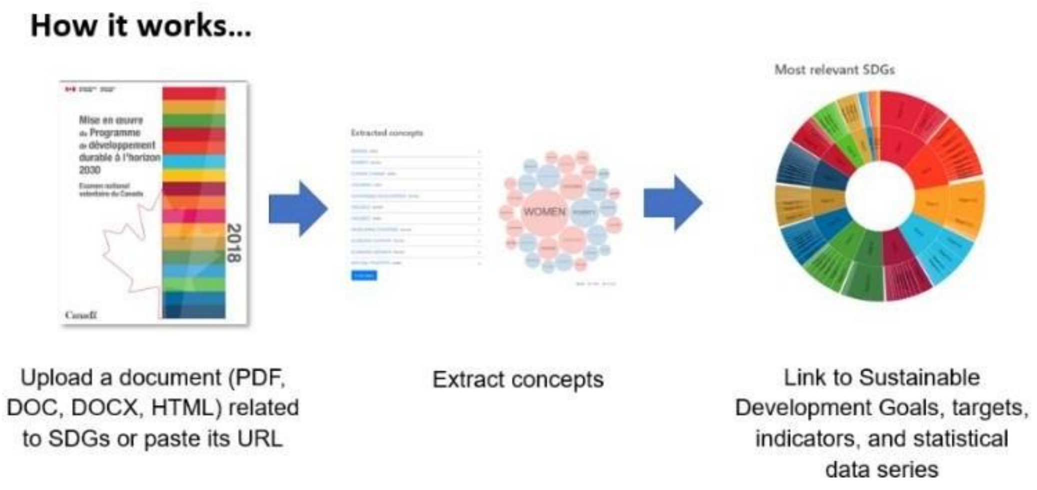
LinkedSDGs is an innovative platform designed to support the 2030 Agenda implementation by:

- Making SDG data interoperable using state-of-the-art data modelling techniques and a common system of permanent identifiers for Goals, Targets,Indicators and related statistical series.
- Promoting data sharing and collaboration among stakeholders who are involved in producing and analyzing SDG data.
- Providing all stakeholders and public with open-source tools to make SDGdata interoperable for easier data integration, analysis and monitoring.

HOW IT WORKS

A **pilot application**, available at LinkedSDGs, showcases the usefulness of adopting semantic web technologies and Linked Open Data (LOD) principles for extracting SDG related metadata from documents and establishing the connectionsamong various SDGs.

The application automatically discovers the semantic links between text documents, relevant SDG entities and the statistical data.



How it works...

Mise en œuvre du Programme de développement durable à l'horizon 2030
Examen national volontaire du Canada
2018
Canada
Extracted concepts
WOMEN
Most relevant SDGs

Upload a document (PDF, DOC, DOCX, HTML) related to SDGs or paste its URL

Extract concepts

Link to Sustainable Development Goals, targets, indicators, and statistical data series

LinkedSDGs – Key Features-

Automatic Extraction of Concepts related to Sustainable Development Goals	A unified view of all SDG concepts mentionedin a given document.
Automatic Extraction of Geographical Areas	Automatic extraction of country and regionalnames and visualization on an interactive map.
Interactive SDG wheel chartfor most relevant SDG	Identification of all the relevant SDGs, which are displayed in an interactive SDG wheel chart that users can further explore by drillinginto targets and indicators.
Discoverability of statisticaldata	List of related datasets, linked through human curated semantic annotation thatuses terms from standard vocabularies.
Support for Multilingualism	Concepts extracted from documents writtenin any one of the six UN official languages.
Developer Friendly	LinkedSDGs is open sourced and the code repositories will be maintained in GitHub for collaboration and code distribution

ANALYSIS

1. ANALYSIS

OBJECTIVE OF PROJECT:

The main objective of this project is to create a platform where the people can visualize the any area of the world so that they can easily take the decision where they have to invest time and human cost and resources.

Create awareness

Infer insights

Actional feedback

One-stop portal

Create charts or plots sustainability data for any country.

REQUIREMENT GATHERING:

Requirements Gathering is a fundamental part of any software development project. These are things like “User wants to do X. How is this achieved?” In effect, Requirements Gathering is the process of generating a list of requirements (functional, system, technical, etc.)

from all the stakeholders (customers, users, vendors, IT staff) that will be used asthe basis for the formal definition of what the project is.

In this step, we need to identify the different data sources, as data can be collected from various sources such as **files**, **database**, **internet**, or **mobile devices**. It is one of the most important steps of the life cycle. The quantity and quality of the collected data will determine the efficiency of the output. The more will be the data, the more accurate will be the prediction.

This step includes the below tasks:

- **Identify various data sources**
- **Collect data**
- **Integrate the data obtained from different sources**

Our gathering is only a platform which gives these facilities-

Mainly we used-

1. World bank data centre where these sustainable data is easily available ofthe world.
2. Certain libraries used in python for mapping the graph.

HARDWARE REQUIREMENTS:

- Memory (Ram)- 128MB (min.)
- Processor- Pentium 4 (1.6GHz.) or above
- 6GHz.) or above ¬ Disk cost-50 MB (min.)
- Pointing Device- yes
- Screen Resolution-1366 x 768 Best fit

SOFTWARE REQUIREMENTS:

Visual studio

Google Chrome.

PyCharm.

MySQL workbench.

FEASIBILITY STUDY:

Feasibility Study in Software Engineering is a study to evaluate feasibility of proposed project or system. Feasibility study is one of stage among important four stages of Software Project Management Process. As name suggests feasibility study is the feasibility analysis or it is a measure of the software product in terms of how much beneficial product development will be for the organization in a practical point of view. Feasibility study is carried out based on many purposes to analyse whether software product will be right in terms of development, implantation, contribution of project to the organization etc.

Types of Feasibility Study:

The feasibility study mainly concentrates on below five mentioned areas. Among these Economic Feasibility Study is most important part of the feasibility analysis and Legal Feasibility Study is less considered feasibility analysis.

1. Technical Feasibility –

In Technical Feasibility current resources both hardware software along with required technology are analysed/assessed to develop project. This technical feasibility study gives report whether there exists correct required resources and technologies which will be used for project development. Along with this, feasibility study also analyses technical skills and capabilities of technical team, existing technology can be used or not, maintenance and up-gradation is easy ornot for chosen technology etc.

2. Operational Feasibility –

In Operational Feasibility degree of providing service to requirements is analysedalong with how much easy product will be to operate and maintenance after deployment. Along with these other operational scopes are determining usability of product, determining suggested solution by software development team is acceptable or not etc.

3. Economic Feasibility –

In Economic Feasibility study cost and benefit of the project is analysed. Means under this feasibility study a detail analysis is carried out what will be cost of the project for development which includes all required cost for final development like hardware and software resource required, design and development cost and operational cost and so on. After that it is analysed whether project will be beneficial in terms of finance for organization or not.

4. Legal Feasibility –

In Legal Feasibility study project is analysed in legality point of view. This includes analysing barriers of legal implementation of project, data protection acts or social media laws, project certificate, license, copyright etc. Overall, it can be said that Legal Feasibility Study is study to know if proposed project conforms legal and ethical requirements.

5. Schedule Feasibility –

In Schedule Feasibility Study mainly timelines/deadlines are analysed for proposed project which includes how many times teams will take to complete final project which has a great impact on the organization as purpose of project may fail if it can't be completed on time.

Customers
Product and service
Founding team
Competition
Start-up needs
Value chain
Industry
Investors
Feasibility Study

SOFTWARE MODELS:

Incremental Model

Incremental Model is a process of software development where requirements divided into multiple standalone modules of the software development cycle. In this model, each module goes through the requirements, design, implementation and testing phases. Every subsequent release of the module adds function to the previous release. The process continues until the complete system achieved.

Life cycle activities –

Requirements of Software are first broken down into several modules that can be incrementally constructed and delivered. At any time, the plan is made just for the next increment and not for any kind of long term plans. Therefore, it is easier to modify the version as per the need of the customer. Development Team first undertakes to develop core features (these do not need services from other features) of the system.

Once the core features are fully developed, then these are refined to increase levels of capabilities by adding new functions in Successive versions. Each incremental version is usually developed using an iterative waterfall model of development.

As each successive version of the software is constructed and delivered, now the feedback of the Customer is to be taken and these were then incorporated in the next version. Each version of the software have more additional features over the previous ones.

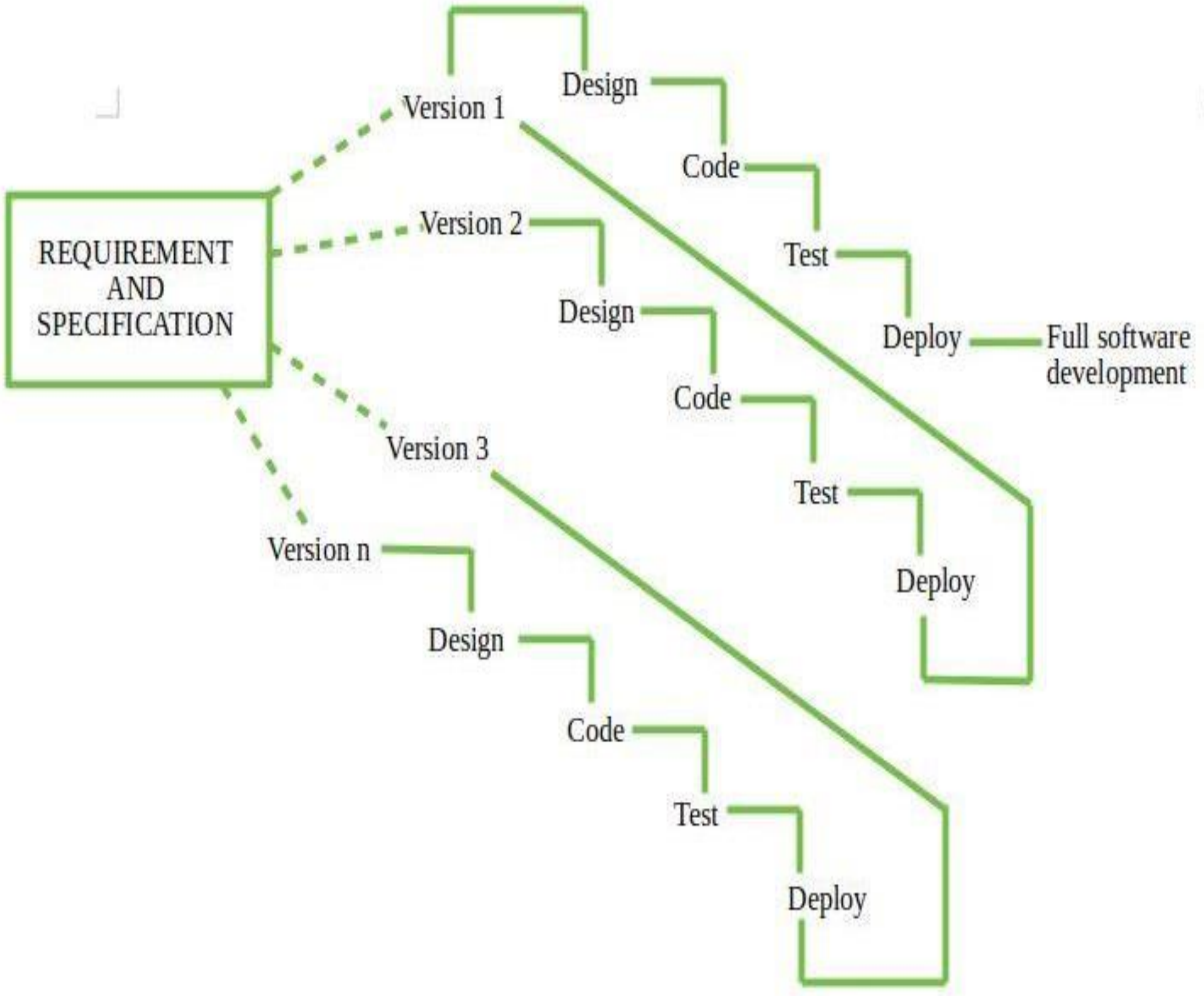
The various phases of incremental model are as follows:

1. Requirement analysis: In the first phase of the incremental model, the product analysis expertise identifies the requirements. And the system functional requirements are understood by the requirement analysis team. To develop the software under the incremental model, this phase performs a crucial role.

2. Design & Development: In this phase of the Incremental model of SDLC, the design of the system functionality and the development method are finished with success. When software develops new practicality, the incremental model uses style and development phase.

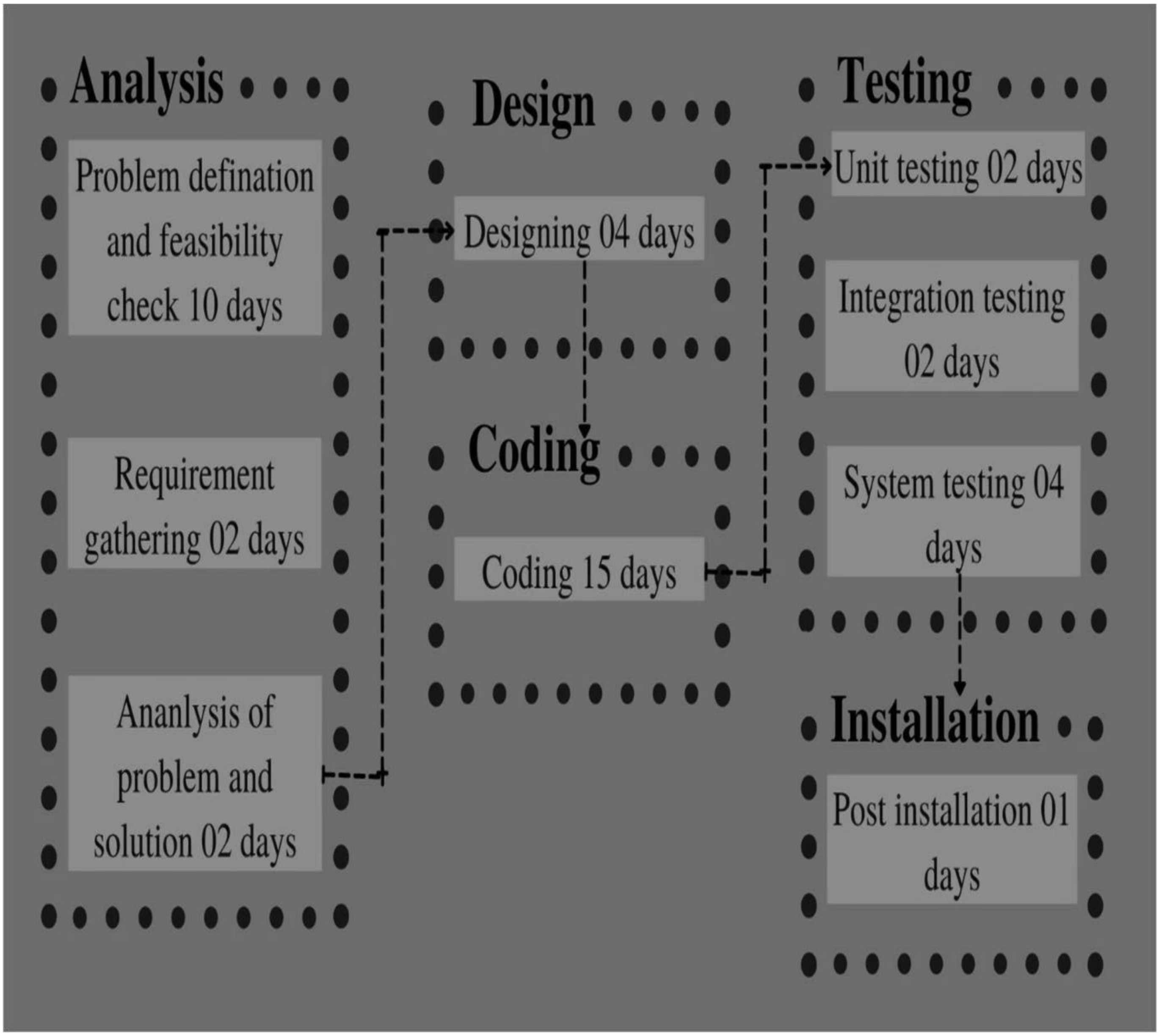
3. Testing: In the incremental model, the testing phase checks the performance of each existing function as well as additional functionality. In the testing phase, the various methods are used to test the behaviour of each task.

4. Implementation: Implementation phase enables the coding phase of the development system. It involves the final coding that design in the designing and development phase and tests the functionality in the testing phase. After completion of this phase, the number of the product working is enhanced and upgraded up to the final system product.



Software Development Life Cycle (SDLC):

SDLC is a process followed for a software project, within a software organization. It consists of a detailed plan describing how to develop, maintain, replace and alter or enhance specific software. The life cycle defines a methodology for improving the quality of software and the overall development process.


Analysis
Problem defination and feasibility check 10 days
Requirement gathering 02 days
Ananlysis of problem and solution 02 days
Design
Designing 04 days
Coding
Coding 15 days
Testing
Unit testing 02 days
Integration testing 02 days
System testing 04 days
Installation
Post installation 01 days

COST ESTIMATION:

For any new software project, it is necessary to know how much it will cost to develop and how much development time will it take. These estimates are needed before development is initiated, but how is this done? Several estimation procedures have been developed and are having the following attributes incommon.

1. Project scope must be established in advanced.

2. Software metrics are used as a support from which evaluation is made.

3.The project is broken into small PCs which are estimated individually. Toachieve true cost & schedule estimate, several option arise.

4. Delay estimation

5. Used symbol decomposition techniques to generate project cost and schedule estimates.

For Finding the Cost We Use Cocomo Model

Cocomo (Constructive Cost Model) is a regression model based on LOC, i.e number of Lines of Code. It is a procedural cost estimate model for software projects and often used as a process of reliably predicting the various parameters associated with making a project such as size, effort, cost, time and quality. It was proposed by Barry Boehm in 1970 and is based on the study of 63 projects, which make it one of the best-documented models.

The key parameters which define the quality of any software products, which are also an outcome of the Cocomo are primarily Effort & Schedule:

• Effort: Amount of labour that will be required to complete a task. It is measured in person-months units.

• Schedule: Simply means the amount of time required for the completion of the job, which is, of course, proportional to the effort put. It is measured in the unitsof time such as weeks, months.

• Organic – A software project is said to be an organic type if the team size required is adequately small, the problem is well understood and has been P a g e | 22 solved in the past and also the team members have a nominal experience regarding the problem.

• Semi-detached – A software project is said to be a Semi-detached type if the vital characteristics such as team-size, experience, knowledge of the various programming environment lie in between that of organic and Embedded. The projects classified as Semi-Detached are comparatively less familiar and difficult to develop compared to the organic ones and require more experience and better guidance and creativity

• Embedded – A software project with requiring the highest level of complexity, creativity, and experience requirement fall under this category. Such software requires a larger team size than the other two models and also the developers need to be sufficiently experienced and creative to develop such complex models.

All the above system types utilize different values of the constants used in Effort Calculations.

Estimation of Effort: Calculations –

1. Basic Model –

Effort (E) = a*(KLOC)b MM

Scheduled Time (D) = c*(E)d Months(M)

N=E/D

Were,

- E = Total effort required for the project in Man-Months (MM).
- D = Total time required for project development in Months (M).
- KLOC = the size of the code for the project in Kilo lines of code.
- a, b, c, d = The constant parameters for a software project.
- N= number of people.

The above formula is used for the cost estimation of for the basic COCOMO model, and also is used in the subsequent models. The constant values a, b, c and d for the Basic Model for the different categories of system:

Software Projects	**a**	**b**	**c**	**d**
Organic	2.4	1.05	2.5	0.38
Semi Detached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

we know there are 3 types of software project/model to find cost

We use organic

So, a=2.4

b=1.05

c=2.5 or c=0.8

now,

E=2.4*(1) *1.05

E=2.520

D=2.5(2.52) ^0.38

D=2.01

N=E/D

N=2.520 /2.01

N=1.2

COST ESTIMATION

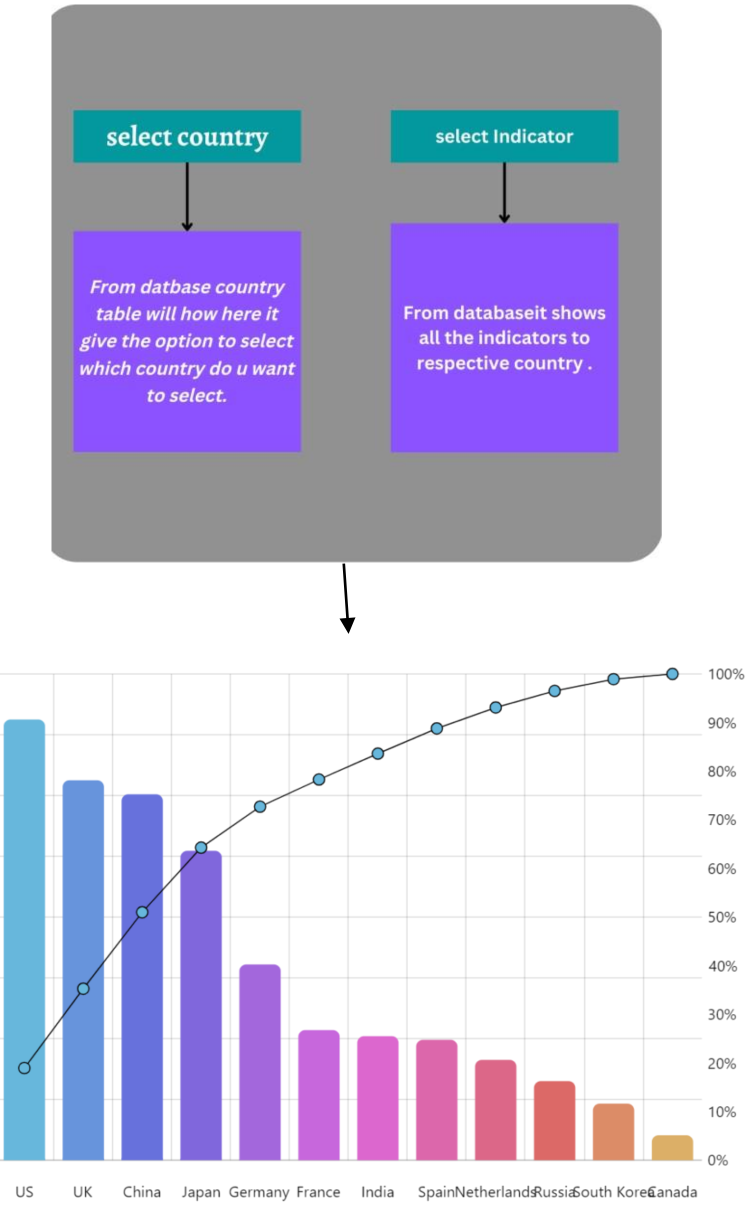
PARTICULARS	QUANTITY	RATE	AMOUNT
No. of lines	3000(approx.)	Rs 3/line	Rs 3000
Man power	3-person,90 days 2hrs/day	Rs 50/2hrs/day	Rs 4500
Maintenance	1 year	Rs 100	Rs 100
Meeting for analysis	2	Rs.100/meet	200
Testing cost	Unit Testing	Rs.200	200
Electricity cost	50 units	Rs.6per Unit	300
System rent	Free of cost	Free of cost	nil
Web-app cost			Rs 8400

DESIGN

DESIGN:

3.1 INPUT REQUIREMENT:

In our web visualizer, basically 2 inputs requirement from the user which is country and the indicator. By clicking on text bar, it automatically shows the list ofcountry and the indicators. On selecting these 2 or selecting country only it shows the graphs of selected sustainable resource.



From datbase country table will how here it give the option to select which country do u want to select.

From databaseit shows all the indicators to respective country .

3.2 Design Of The Database:

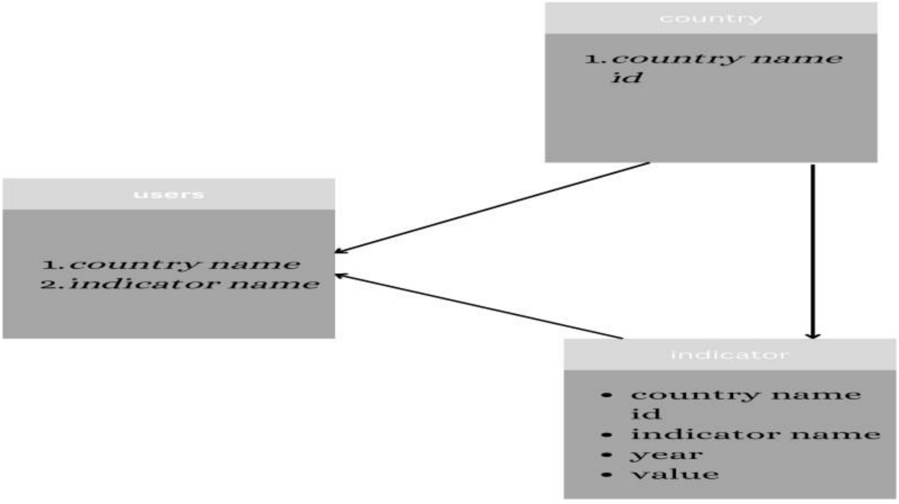
SQL databases serve as a cornerstone for several applications and services across industries. Enterprises rely on SQL database servers for storing and retrieving data as it facilitates a broad range of operational capabilities, including transaction processing, analytics, and business intelligence required to manage business-criticalapplications.

Relational databases contain multiple tables with relevant columns (Attribute) and rows (Record) along with a unique primary key. When the user executes a query, it either updates or modifies the data in the database or retrieves the relevant results for specific queries after checking constraints.

Users can leverage SQL databases to get meaningful information by joining various tables to understand the context and data relationships better. SQL is used to execute basic data management functions and complex queries to transform available raw data into useful and contextual information. Database users can use standard SQL languages such as data definition language (DDL) for creating the database and table structures and data manipulation language (DML) to insert, update, delete, and select data within the tables.

We have directly loaded the data from the world data bank its easily available on online free of cost.

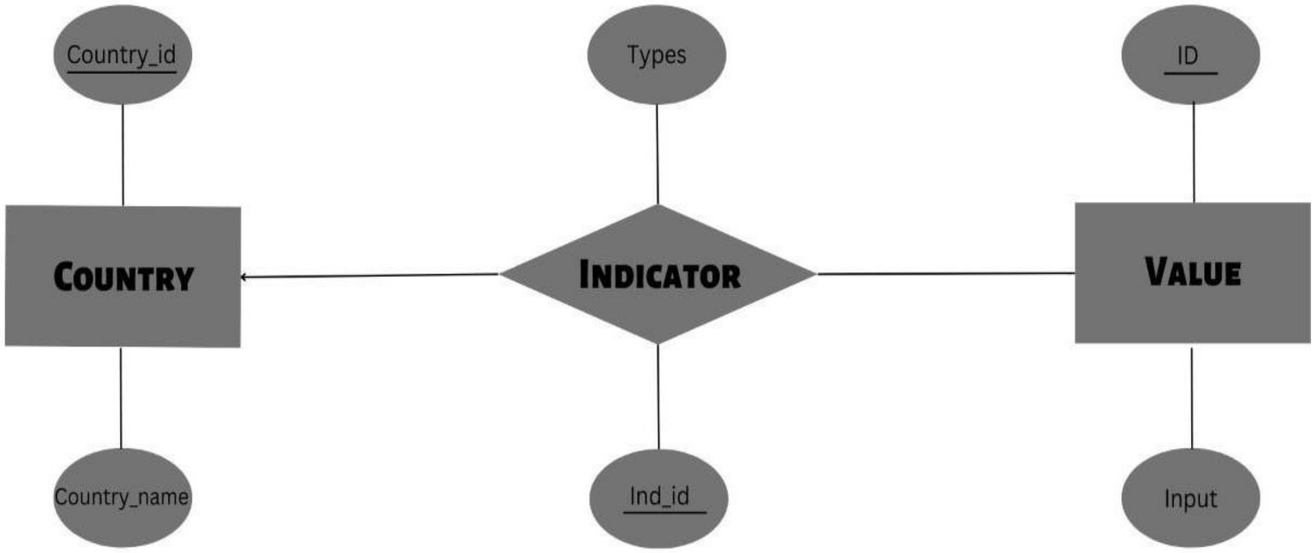
World data bank has all the sustainable data of all the country with their respective indicators which is available in the country.



3.3 ER-Diagram:

ER Diagram stands for Entity Relationship Diagram, also known as ERD is a diagram that displays the relationship of entity sets stored in a database. In other words, ER diagrams help to explain the logical structure of databases. ER diagrams are created based on three basic concepts: entities, attributes and relationships.

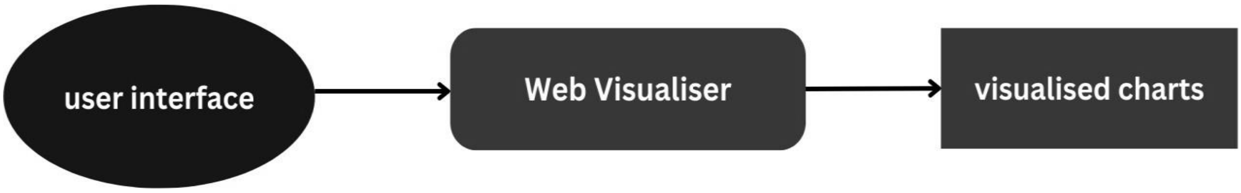
ER Diagrams contain different symbols that use rectangles to represent entities, ovals to define attributes and diamond shapes to represent relationships



3.4 DATA FLOW DIAGRAM:

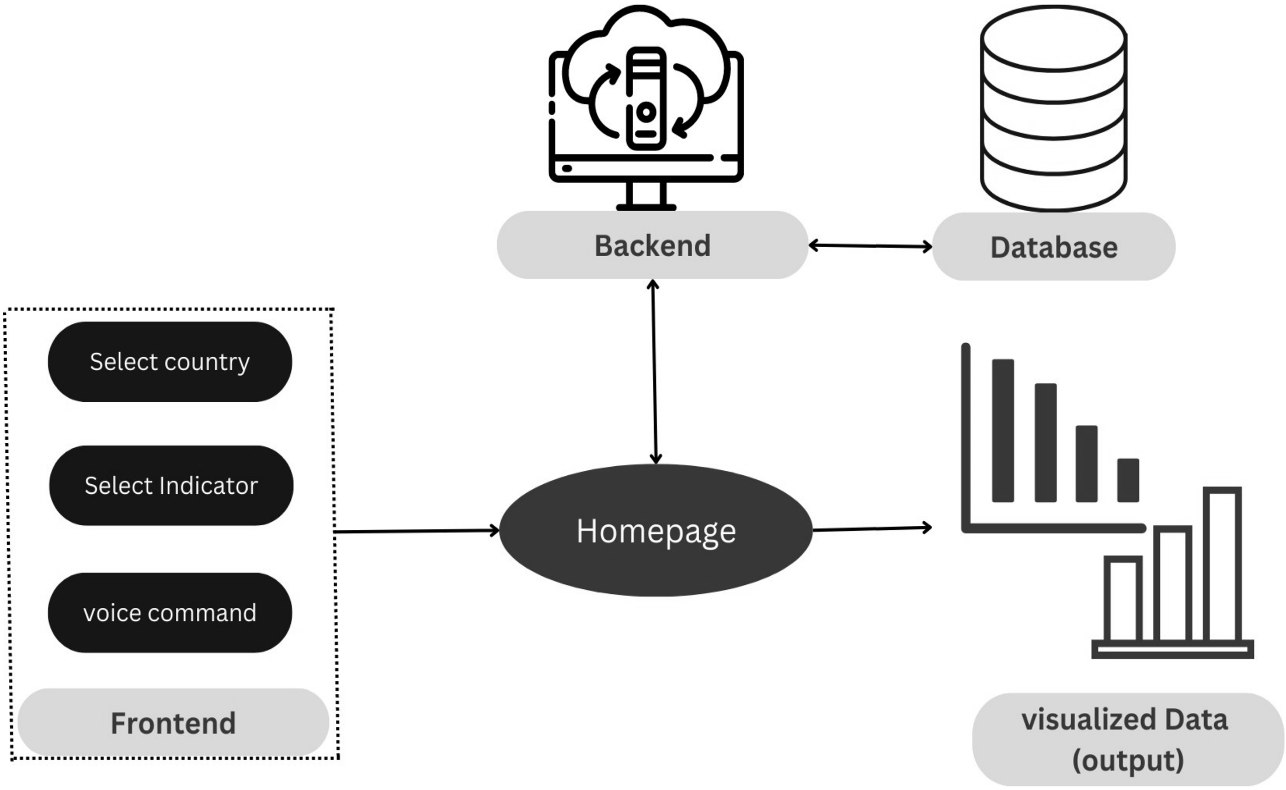
0-level DFD

It is also known as fundamental system model, or context diagram represents theentire software requirement as a single bubble with input and output data denoted by incoming and outgoing arrows. Then the system is decomposed and described as a DFD with multiple bubbles. Parts of the system represented by each of these bubbles are then decomposed and documented as more and moredetailed DFDs. This process may be repeated at as many levels as necessary until the program at hand is well understood.



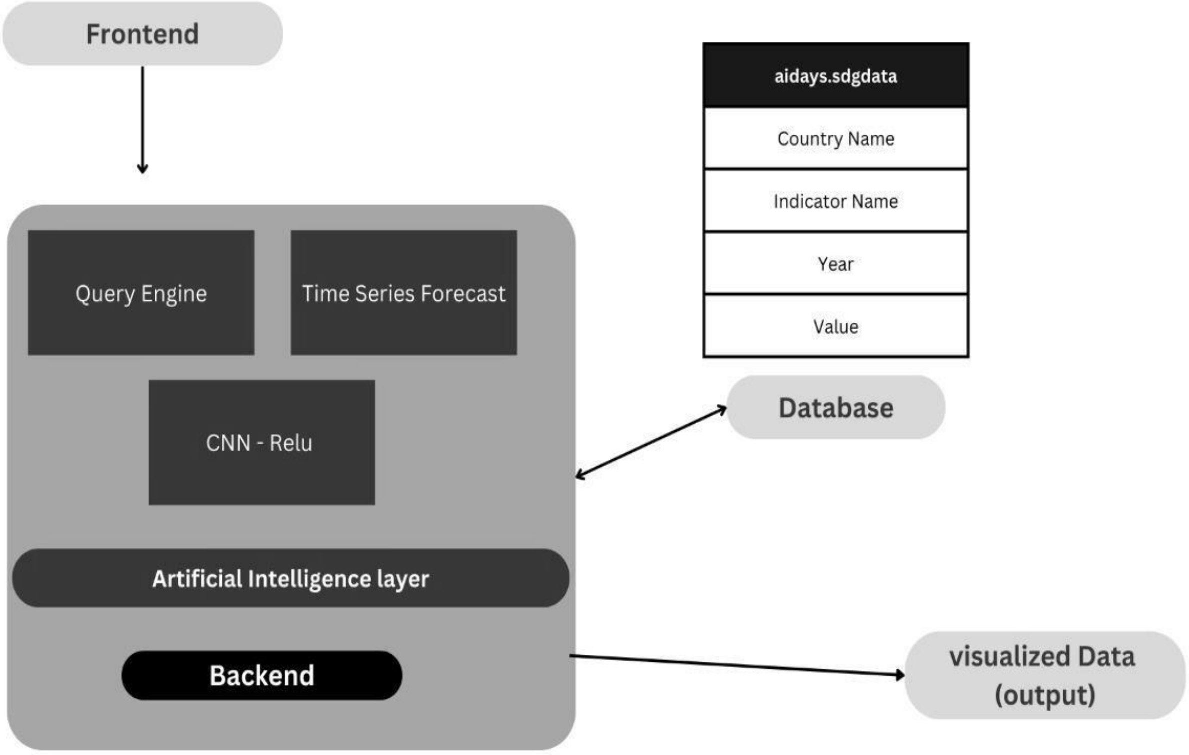
1- level DFD

In 1-level DFD, a context diagram is decomposed into multiple bubbles/processes. In this level, we highlight the main objectives of thesystem and breakdown the high-level process of 0-level DFD into subprocesses.



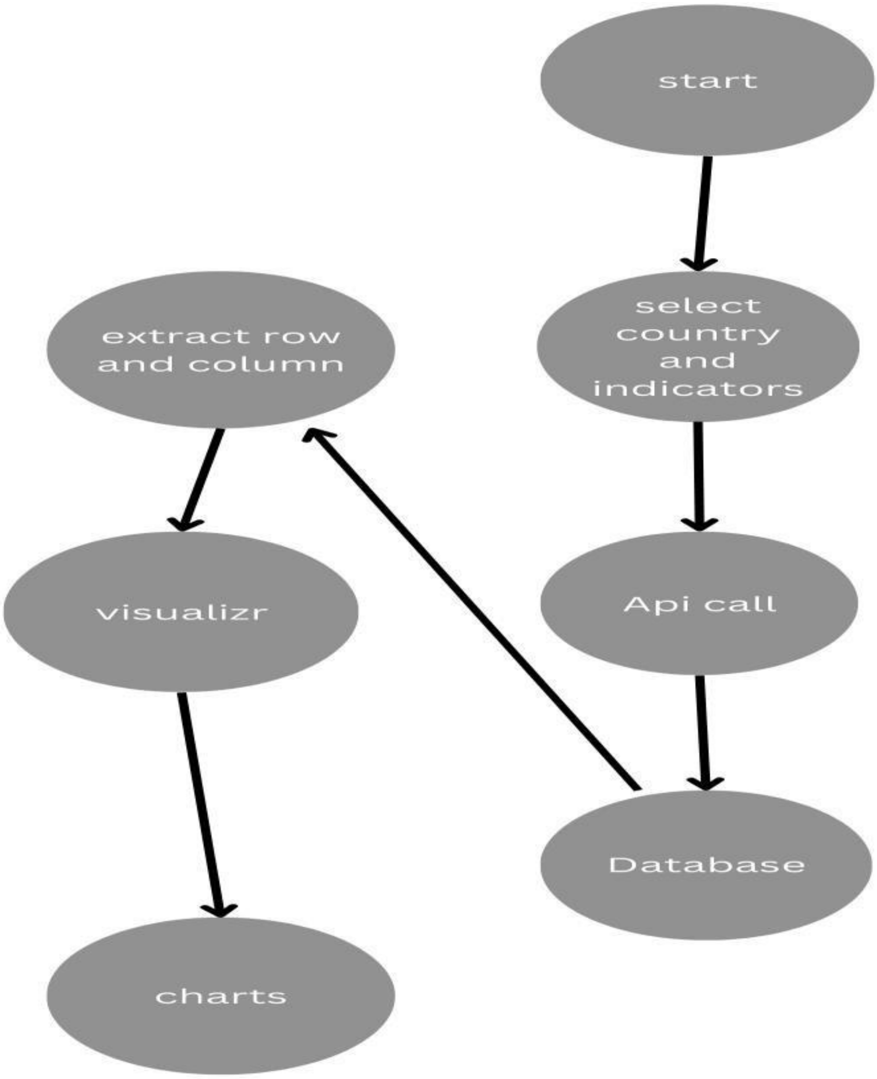
2- Level DFD

2-level DFD goes one process deeper into parts of 1-level DFD. It can be used toproject or record the specific/necessary detail about the system's functioning.



3.1 Control Flow Diagram:

A flow diagram can be developed for the process [control system] for each critical activity. Process control is normally a closed cycle in which a sensor . The application determines if the sensor information is within the predetermined (or calculated) data parameters and constraints. The results of this comparison, which controls the critical component. This [feedback] may control the component electronically or may indicate the need for a manual action .This closed-cycle process has many checks and balances to ensure that it stays safe.It may be fully computer controlled and automated, or it may be a hybrid in which only the sensor is automated and the action requires manual intervention.



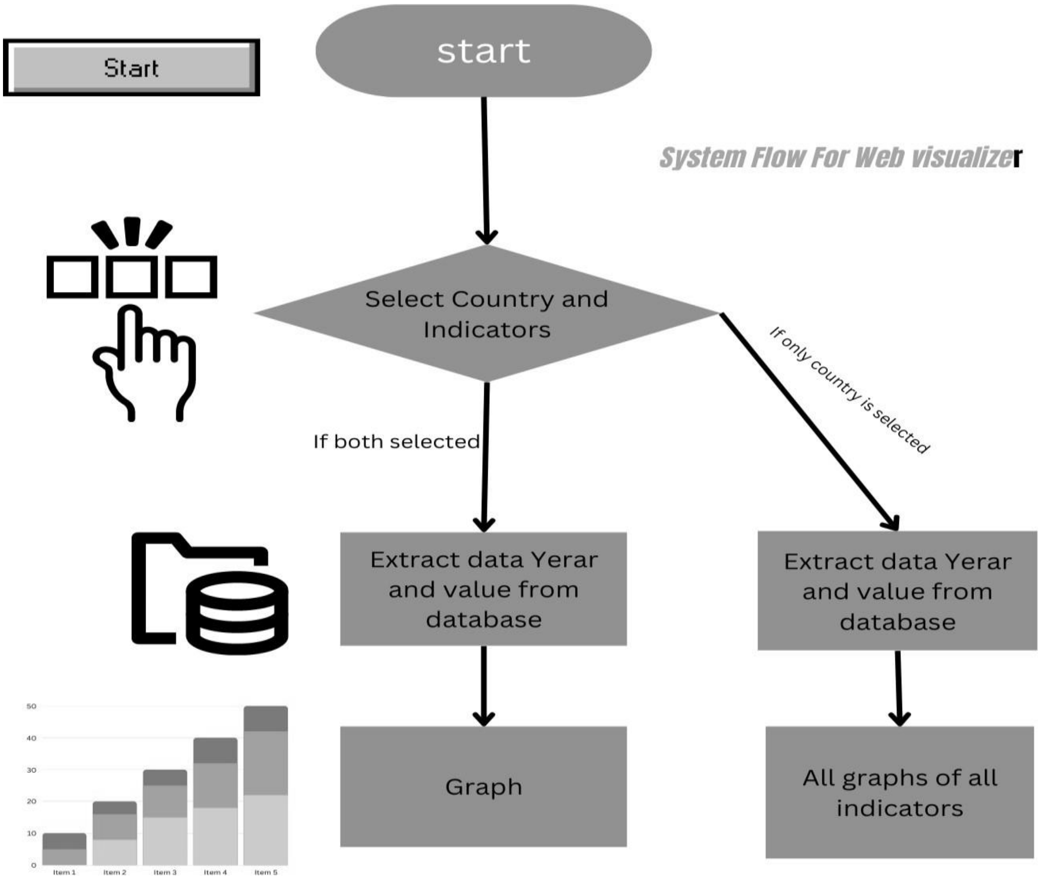
3.2 System Flow Diagram:

A **flowchart** is often used to manage, analyze, design a process in many different fields. It is a useful tool that everyone should learn to help solve problems easier and more efficiently.

Document flowcharts show you the flow of documents from one business unit to another.

- **Data flowcharts** let you see the overall data flow in a system.

- Program flowcharts show you a program’s control in a system. They are also oneof the essential tools in programming.

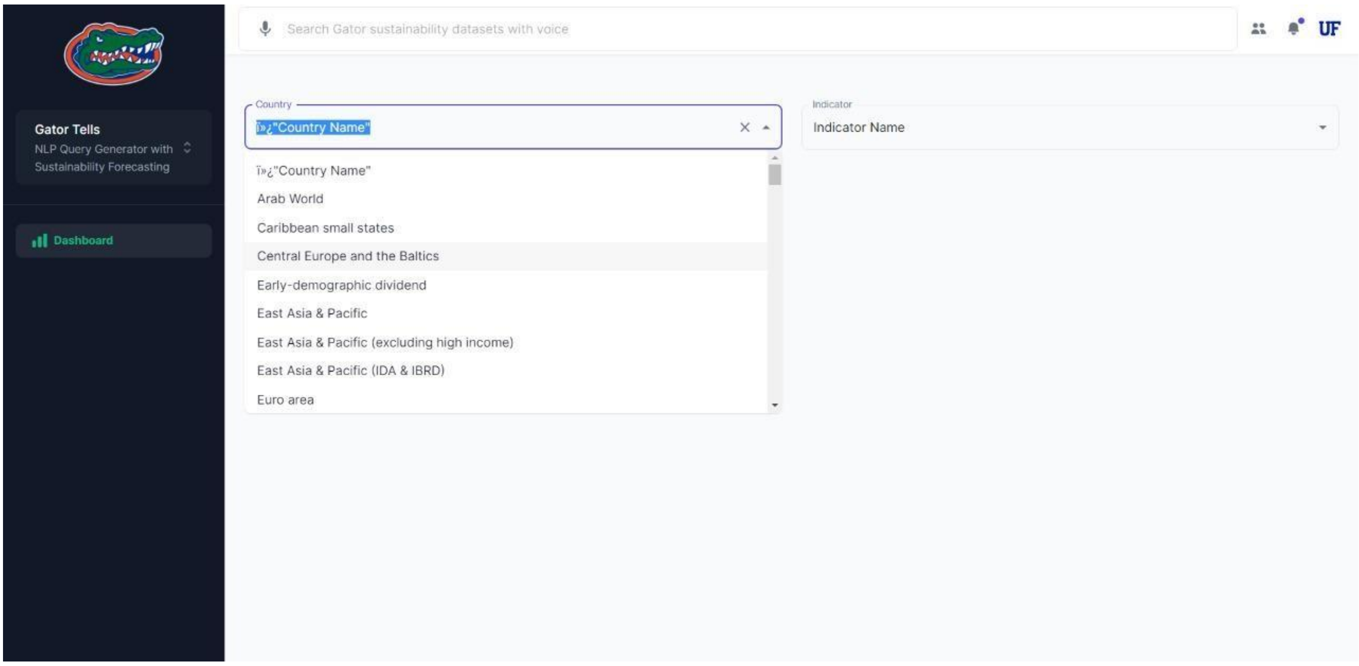

Start
start
System Flow For Web visualizer
Select Country and Indicators
If both selected
If only country is selected
Extract data Yerar and value from database
Extract data Yerar and value from database
Graph
All graphs of all indicators
50
40
30
20
10
0
Item 1
Item 2
Item 3
Item 4
Item 5

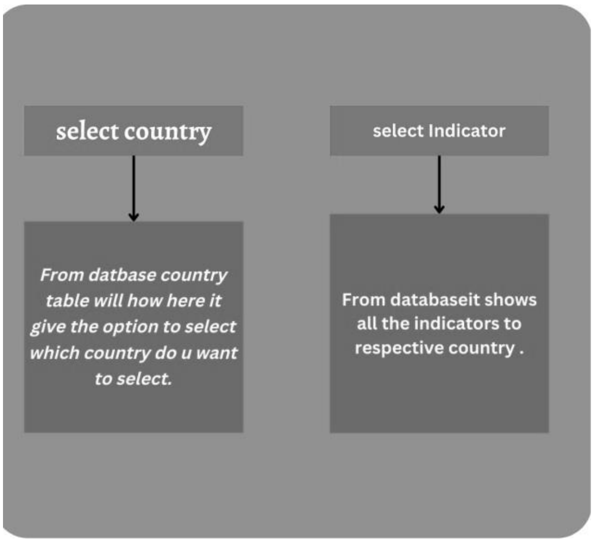
3.3 User Interface:

On the home page there were two option that shows to select country andindicators.

It is user friendly websites user do not require much more knowledge about tooperate only the basic need is that to read the graph.

By voice recognition user can also give command like “I want to show the chartsof Arab country and oil indicator.


Search Gator sustainability datasets with voice
UF
Gator Tells
NLP Query Generator with Sustainability Forecasting
Dashboard
Country
ï»¿"Country Name"
ï»¿"Country Name"
Arab World
Caribbean small states
Central Europe and the Baltics
Early-demographic dividend
East Asia & Pacific
East Asia & Pacific (excluding high income)
East Asia & Pacific (IDA & IBRD)
Euro area
Indicator
Indicator Name



From datbase country table will how here it give the option to select which country do u want to select.

From databaseit shows all the indicators to respective country .

TOOLS USED

TOOLS USED:

Web development is the work involved in developing a website for the Internet (World Wide Web) or an intranet (a private network).Web development can range from developing a simple single static page of plain text to complex web applications, electronic businesses, and social network services. A more comprehensive list of tasks to which Web development commonly refers, may include Web engineering, Web design, Web content development, client liaison, client-side/server-side scripting, Web server and network security configuration, ande-commerce development.

Among Web professionals, "Web development" usually refers to the main non-design aspects of building Web sites: writing markup and coding.[2] Web development may use content management systems (CMS) to make content changes easier and available with basic technical skills.

1. **HTML (Hypertext Markup Language)** is the most basic building block of the Web. It defines the meaning and structure of web content. Other technologies besides HTML are generally used to describe a web page'sappearance/presentation (CSS) or functionality/behaviour (JavaScript).

"Hypertext" refers to links that connect web pages to one another, either within a single website or between websites. Links are a fundamental aspect of the Web. By uploading content to the Internet and linking it to pages created by other people, you become an active participant in the World Wide Web.

HTML uses "markup" to annotate text, images, and other content for display in a Web browser. HTML markup includes special "elements" such as ,<head>,<title>, <body>,<header>,<footer>,<article>,<section>,<p>,<div>,<span><img>,<aside> ,<audio>,<canvas>,<datalist>,<details>,<embed>,<nav>,<output>,<video> and many others.

An HTML element is set off from other text in a document by "tags", which consist of the element name surrounded by "<" and ">". The name of an element inside a tag is case insensitive. That is, it can be written in uppercase, lowercase, or a mixture.
For example, the <title> tag can be written as <Title>,<TITLE>,or in any other way.

HTML elements are the building blocks of HTML pages. With HTML constructs, images and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. HTML elements are delineated by tags, written using angle

brackets. Tags such as<img/> and <input/> directly introduce content into the page. Other tags such as
surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags, but use them to interpret the content of the page. HTML can embed programs written in a scripting language such as JavaScript, which affects the behaviour and content of web pages. Inclusionof CSS defines the look and layout of content. The World Wide Web Consortium (W3C), former maintainer of the HTML and current maintainer of the CSS standards, has encouraged the use of CSS over explicit presentational HTML since 1997.

2. **Cascading Style Sheets (CSS)** is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSSis a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

CSS is designed to enable the separation of presentation and content, including layout, colours, and fonts.[3] This separation can improve content accessibility; provide more flexibility and control in the specification of presentation characteristics; enable multiple web pages to share formatting by specifying the relevant CSS in a separate .CSS file, which reduces complexity and repetition in the structural content; and enable the .CSS file to be cached to improve the pageload speed between the pages that share the file and its formatting.

Separation of formatting and content also makes it feasible to present the same markup page in different styles for different rendering methods, such as on-screen,in print, by voice (via speech-based browser or screen reader), and on Braille- based tactile devices. CSS also has rules for alternate formatting if the content is accessed on a mobile device.

The name cascading comes from the specified priority scheme to determine whichstyle rule applies if more than one rule matches a particular element. This cascading priority scheme is predictable.

CSS has a simple syntax and uses a number of English keywords to specify thenames of various style properties.

A style sheet consists of a list of rules. Each rule or rule-set consists of one ormore selectors, and a declaration block.

In CSS, selectors declare which part of the markup a style applies to by matchingtags and attributes in the markup itself.

Classes and IDs are case-sensitive, start with letters, and can include alphanumeric characters, hyphens, and underscores. A class may apply to any number of instances of any elements. An ID may only be applied to a single element.

Before CSS, nearly all presentational attributes of HTML documents were contained within the HTML markup. All font colours, background styles, element alignments, borders and sizes had to be explicitly described, often repeatedly, within the HTML. CSS lets authors move much of that information to another file,the style sheet, resulting in considerably simpler HTML.

For example, headings (h1 elements), sub-headings (h2), sub-sub-headings (h3), etc., are defined structurally using HTML. In print and on the screen, choice of font,size, colour and emphasis for these elements is presentational.

Before CSS, document authors who wanted to assign
such typographic characteristics to, say, all h2 headings had to repeat HTML presentational markup for each occurrence of that heading type. This made documents more complex, larger, and more error-prone and difficult to maintain. CSS allows the separation of presentation from structure. CSS can define colour, font, text alignment, size, borders, spacing, layout and many other typographic characteristics, and can do so independently for on-screen and printed views. CSSalso defines non-visual styles, such as reading speed and emphasis for aural text reader.

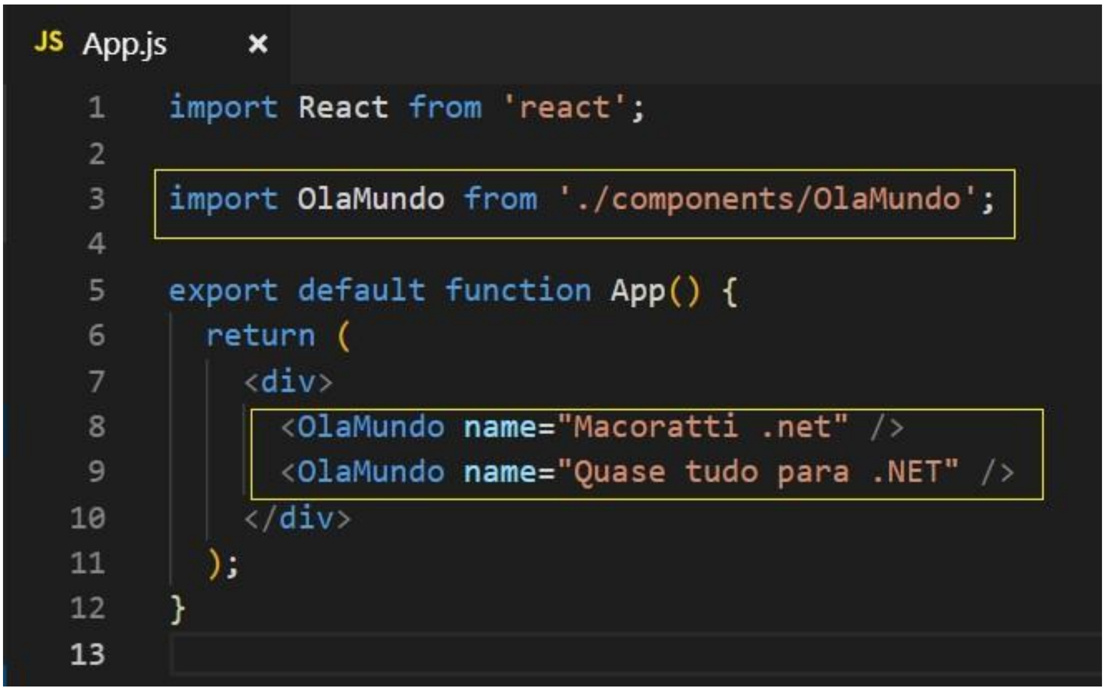
3. REACT:

React makes it painless to create interactive UIs. Design simple views for each state in your application, and React will efficiently update and render just the right components when your data changes.

Declarative views make your code more predictable and easier to debug. Build encapsulated components that manage their own state, then compose them to make complex UIs.

Since component logic is written in JavaScript instead of templates, you can easily pass rich data through your app and keep state out of the DOM. We don’t make assumptions about the rest of your technology stack, so you can develop new features in React without rewriting existing code.

React can also render on the server using Node React components implement a render () method that takes input data and returns what to display. This example uses an XML-like syntax called JSX. Input data that is passed into the component can be accessed by render () via props.



```
import React from 'react';

import OlaMundo from './components/OlaMundo';

export default function App() {
  return (
    <div>
      <OlaMundo name="Macoratti .net" />
      <OlaMundo name="Quase tudo para .NET" />
    </div>
  );
}
```

React (also known as React.js or ReactJS) is a free and open source front-end JavaScript library for building user interfaces based on UI components. It is maintained by Meta (formerly Facebook) and a community of individual developers and companies.[4][5][6] React can be used as a base in the development of single-page or mobile applications. However, React is only concerned with state management and rendering that state to the DOM, so creating React applications usually requires the use of additional libraries for routing, as well as certain client-side functionality.

FLASK:

Flask is a micro web framework written in Python. It is classified as a microframework because it does not require particular tools or libraries. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions. However, Flask supports extensions that can add application features as if they wereimplemented in Flask itself. Extensions exist for object-relational mappers, form validation, upload handling, various open authentication technologies and several common framework related tools.

A Web Application Framework or a simply a Web Framework represents acollection of libraries and modules that enable web application developers to write applications without worrying about low-level details such as protocol, thread management, and so on.

Flask is a web application framework written in Python. It was developed by Armin Ronacher, who led a team of international Python enthusiasts called Poocco. Flaskis based on the Werkzeg WSGI toolkit and the Jinja2 template engine. Both are Pocco projects.

WSGI

The Web Server Gateway Interface (Web Server Gateway Interface, WSGI) hasbeen used as a standard for Python web application development. WSGI is the specification of a common interface between web servers and web applications.

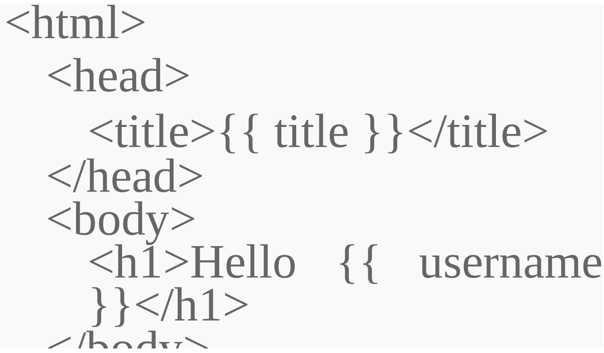
Werkzeug

Werkzeug is a WSGI toolkit that implements requests, response objects, and utility functions. This enables a web frame to be built on it. The Flask framework uses Werkzeg as one of its bases.

jinja2

jinja2 is a popular template engine for Python.A web template system combines a template with a specific data source to render a dynamic web page.

This allows you to pass Python variables into HTML templates like this:



```
<html>
   <head>
      <title>{{ title }}</title>
   </head>
   <body>
      <h1>Hello   {{   username
      }}</h1>
   </body>
```

Microframework

Flask is often referred to as a microframework. It is designed to keep the core of the application simple and scalable.

Instead of an abstraction layer for database support, Flask supports extensions toadd such capabilities to the application.

5.NLP:

Natural language processing (NLP) refers to the branch of computer science—andmore specifically, the branch of artificial intelligence or AI—concerned with giving computers the ability to understand text and spoken words in much the same way human beings can.

NLP combines computational linguistics—rule-based modeling of human language—with statistical, machine learning, and deep learning models. Together, these technologies enable computers to process human language in the form of textor voice data and to 'understand' its full meaning, complete with the speaker or writer's intent and sentiment.

NLP drives computer programs that translate text from one language to another, respond to spoken commands, and summarize large volumes of text rapidly—even in real time. There's a good chance you've interacted with NLP in the form of voice- operated GPS systems, digital assistants, speech-to-text dictation software, customer service chatbots, and other consumer conveniences. But NLP also plays agrowing role in enterprise solutions that help streamline business operations, increase employee productivity, and simplify mission-critical business processes.

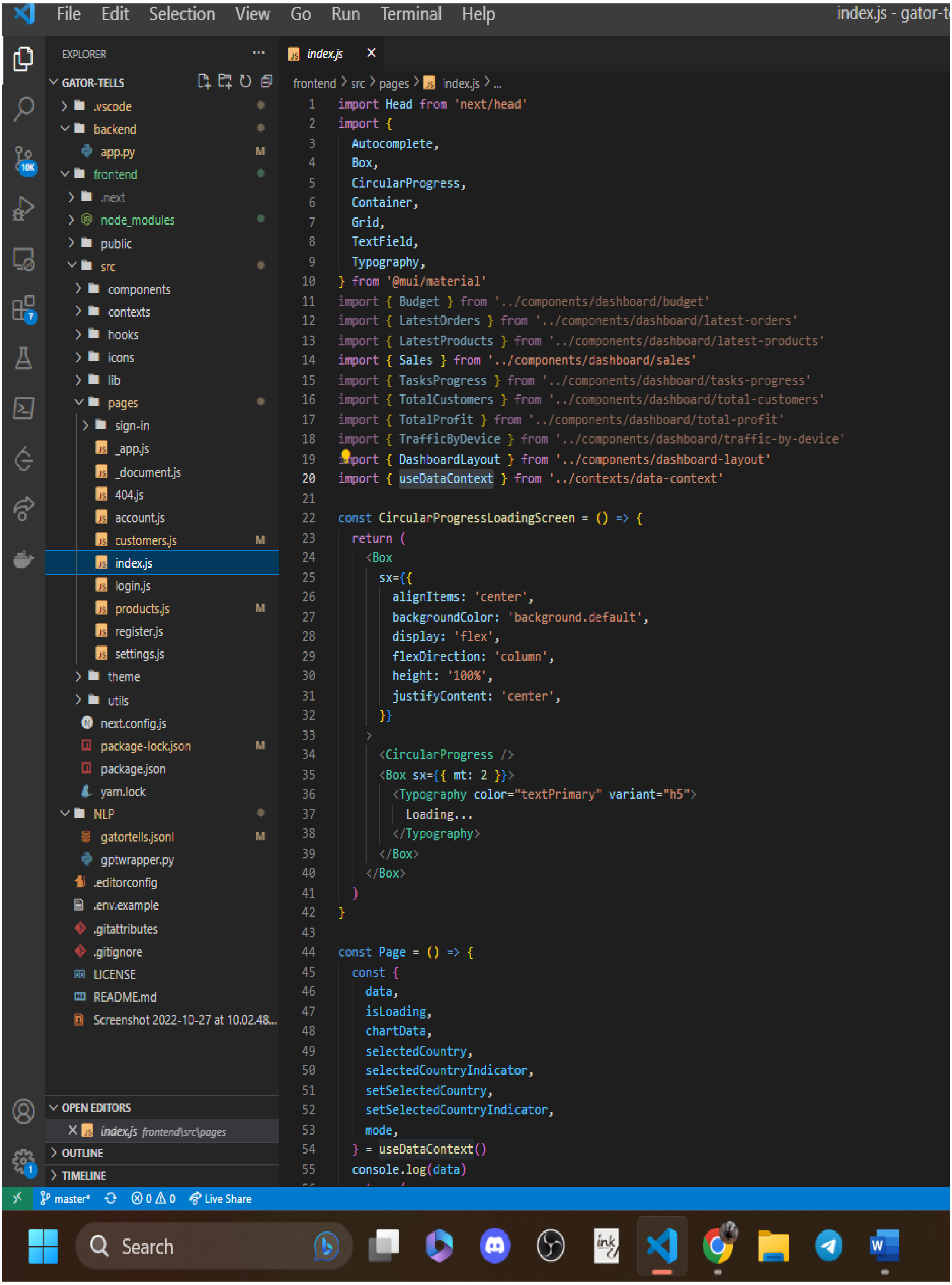
Human language is filled with ambiguities that make it incredibly difficult to write software that accurately determines the intended meaning of text or voice data. Homonyms, homophones, sarcasm, idioms, metaphors, grammar and usage exceptions, variations in sentence structure—these just a few of the irregularities of human language that take humans years to learn, but that programmers must teachnatural language-driven applications to recognize and understand accurately from the start, if those applications are going to be useful.

Several NLP tasks break down human text and voice data in ways that help thecomputer make sense of what it's ingesting. Some of these tasks include the following:

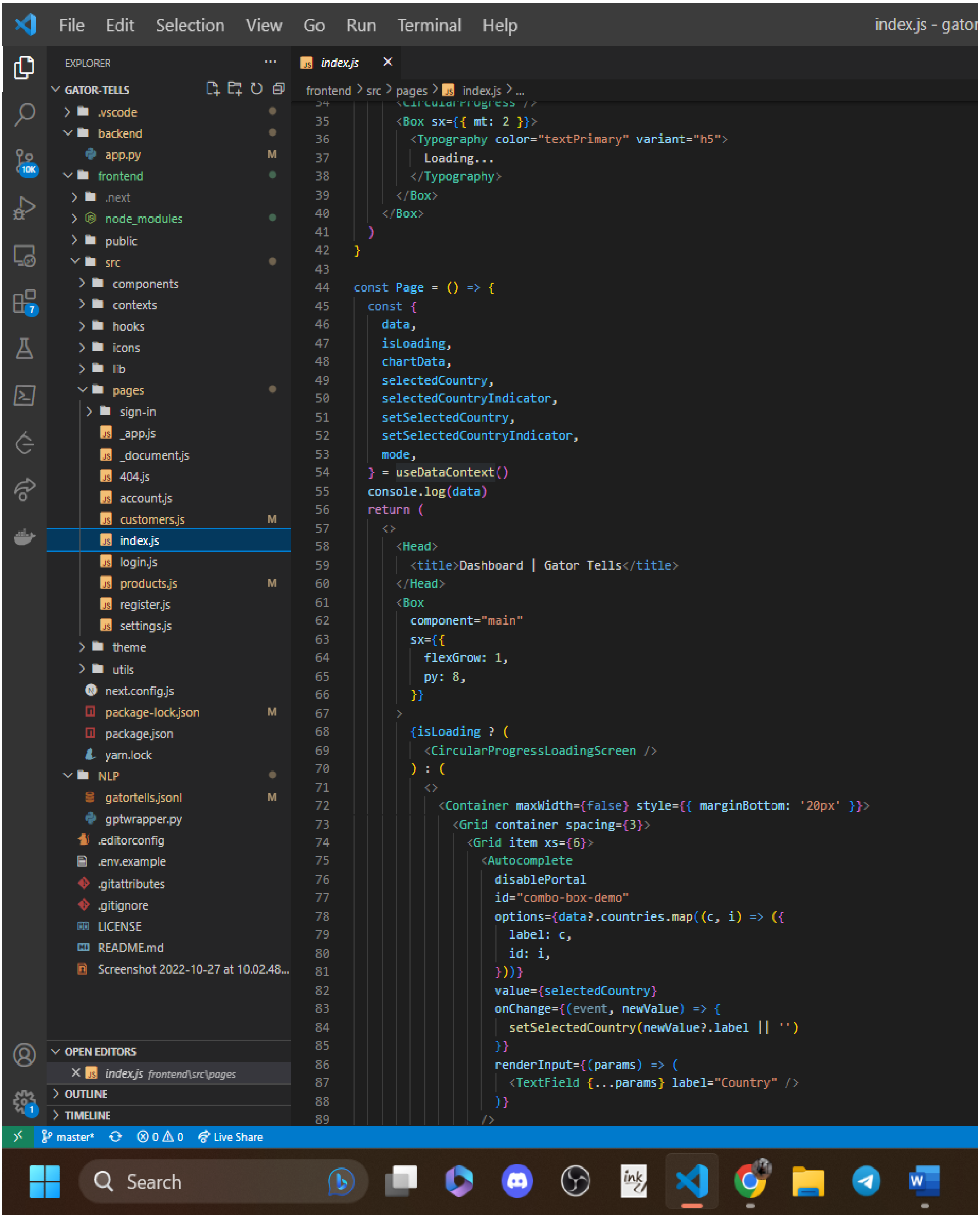
- **Speech recognition**, also called speech-to-text, is the task of reliably converting voice data into text data. Speech recognition is required for any application that follows voice commands or answers spoken questions. Whatmakes speech recognition especially challenging is the way people talk— quickly, slurring words together, with varying emphasis and intonation, in different accents, and often using incorrect grammar.
- **Part of speech tagging**, also called grammatical tagging, is the process of determining the part of speech of a particular word or piece of text based onits use and context. Part of speech identifies ‘make’ as a verb in ‘I can makea paper plane,’ and as a noun in ‘What make of car do you own?’
- **Word sense disambiguation** is the selection of the meaning of a word with multiple meanings through a process of semantic analysis that determine theword that makes the most sense in the given context. For example, word sense disambiguation helps distinguish the meaning of the verb 'make' in ‘make the grade’ (achieve) vs. ‘make a bet’ (place).
- **Named entity recognition,** or NEM, identifies words or phrases as useful entities. NEM identifies ‘Kentucky’ as a location or ‘Fred’ as a man's name.
- **Co-reference resolution** is the task of identifying if and when two words refer to the same entity. The most common example is determining the person or object to which a certain pronoun refers (e.g., ‘she’ = ‘Mary’), but itcan also involve identifying a metaphor or an idiom in the text (e.g., an instance in which 'bear' isn't an animal but a large hairy person).
- **Sentiment analysis** attempts to extract subjective qualities—attitudes, emotions, sarcasm, confusion, suspicion—from text.
- **Natural language generation** is sometimes described as the opposite ofspeech recognition or speech-to-text; it's the task of putting structured information into human language.

CODING

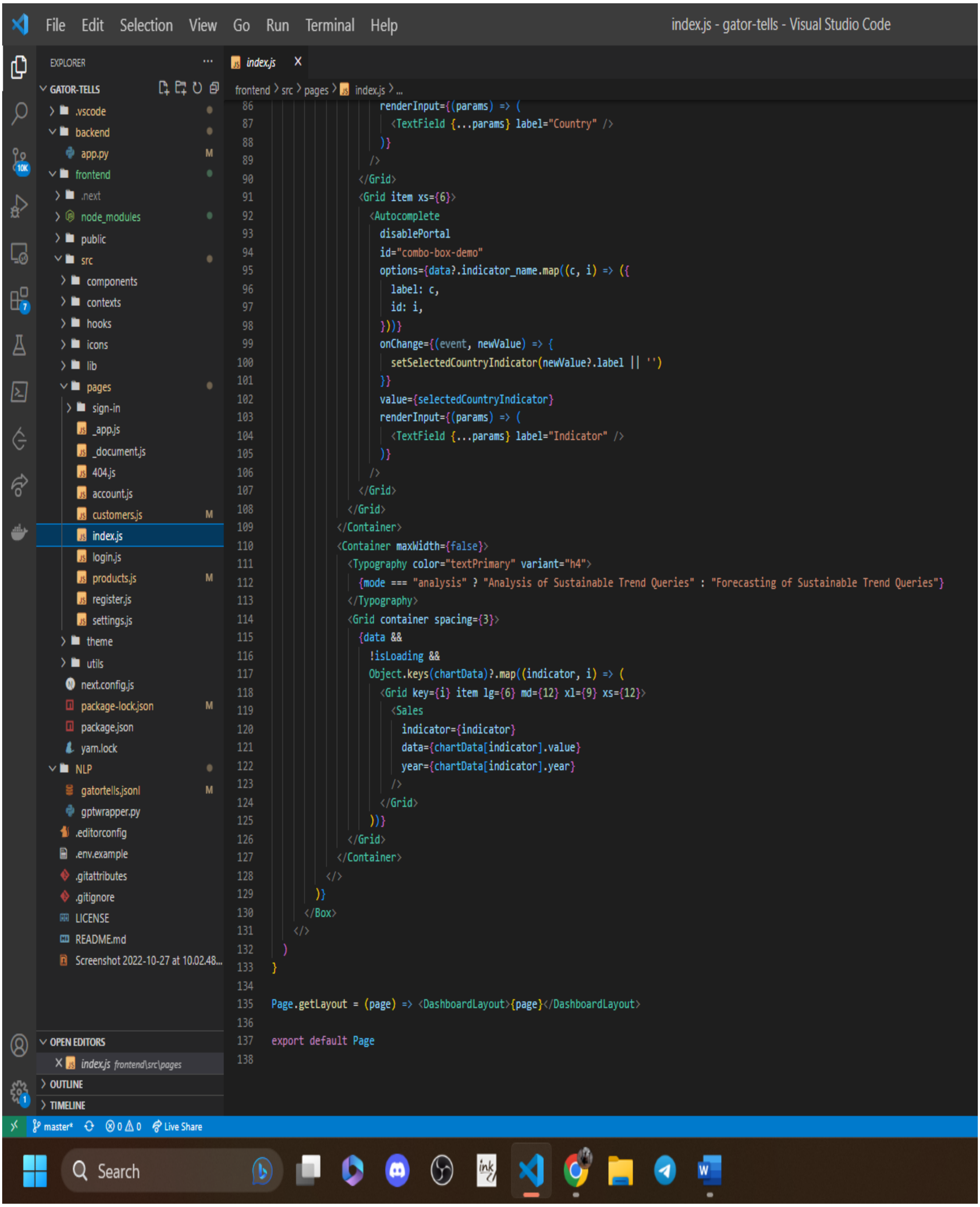
Frontend



```
import Head from 'next/head'
import {
  Autocomplete,
  Box,
  CircularProgress,
  Container,
  Grid,
  TextField,
  Typography,
} from '@mui/material'
import { Budget } from '../components/dashboard/budget'
import { LatestOrders } from '../components/dashboard/latest-orders'
import { LatestProducts } from '../components/dashboard/latest-products'
import { Sales } from '../components/dashboard/sales'
import { TasksProgress } from '../components/dashboard/tasks-progress'
import { TotalCustomers } from '../components/dashboard/total-customers'
import { TotalProfit } from '../components/dashboard/total-profit'
import { TrafficByDevice } from '../components/dashboard/traffic-by-device'
import { DashboardLayout } from '../components/dashboard-layout'
import { useDataContext } from '../contexts/data-context'

const CircularProgressLoadingScreen = () => {
  return (
    <Box
      sx={{
        alignItems: 'center',
        backgroundColor: 'background.default',
        display: 'flex',
        flexDirection: 'column',
        height: '100%',
        justifyContent: 'center',
      }}
    >
      <CircularProgress />
      <Box sx={{ mt: 2 }}>
        <Typography color="textPrimary" variant="h5">
          Loading...
        </Typography>
      </Box>
    </Box>
  )
}

const Page = () => {
  const {
    data,
    isLoading,
    chartData,
    selectedCountry,
    selectedCountryIndicator,
    setSelectedCountry,
    setSelectedCountryIndicator,
    mode,
  } = useDataContext()
  console.log(data)
```

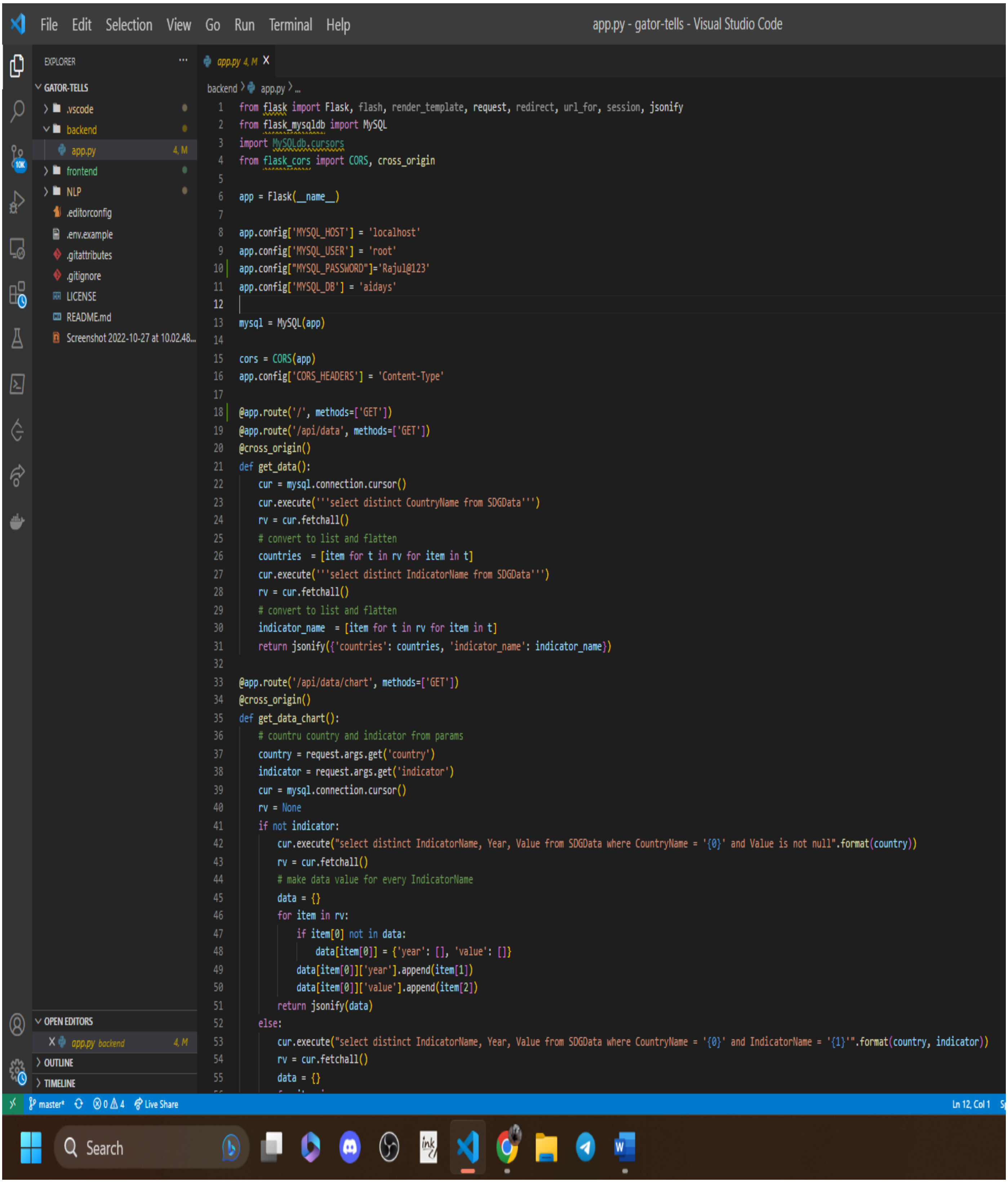


```
      <CircularProgress />
      <Box sx={{ mt: 2 }}>
        <Typography color="textPrimary" variant="h5">
          Loading...
        </Typography>
      </Box>
    </Box>
  )
}

const Page = () => {
  const {
    data,
    isLoading,
    chartData,
    selectedCountry,
    selectedCountryIndicator,
    setSelectedCountry,
    setSelectedCountryIndicator,
    mode,
  } = useDataContext()
  console.log(data)
  return (
    <>
      <Head>
        <title>Dashboard | Gator Tells</title>
      </Head>
      <Box
        component="main"
        sx={{
          flexGrow: 1,
          py: 8,
        }}
      >
        {isLoading ? (
          <CircularProgressLoadingScreen />
        ) : (
          <>
            <Container maxWidth={false} style={{ marginBottom: '20px' }}>
              <Grid container spacing={3}>
                <Grid item xs={6}>
                  <Autocomplete
                    disablePortal
                    id="combo-box-demo"
                    options={data?.countries.map((c, i) => ({
                      label: c,
                      id: i,
                    }))}
                    value={selectedCountry}
                    onChange={(event, newValue) => {
                      setSelectedCountry(newValue?.label || '')
                    }}
                    renderInput={(params) => (
                      <TextField {...params} label="Country" />
                    )}
                  />
```


File Edit Selection View Go Run Terminal Help
index.js - gator-tells - Visual Studio Code
EXPLORER
GATOR-TELLS
index.js
frontend > src > pages > index.js > ...
OPEN EDITORS
OUTLINE
TIMELINE
master*
Live Share
Search

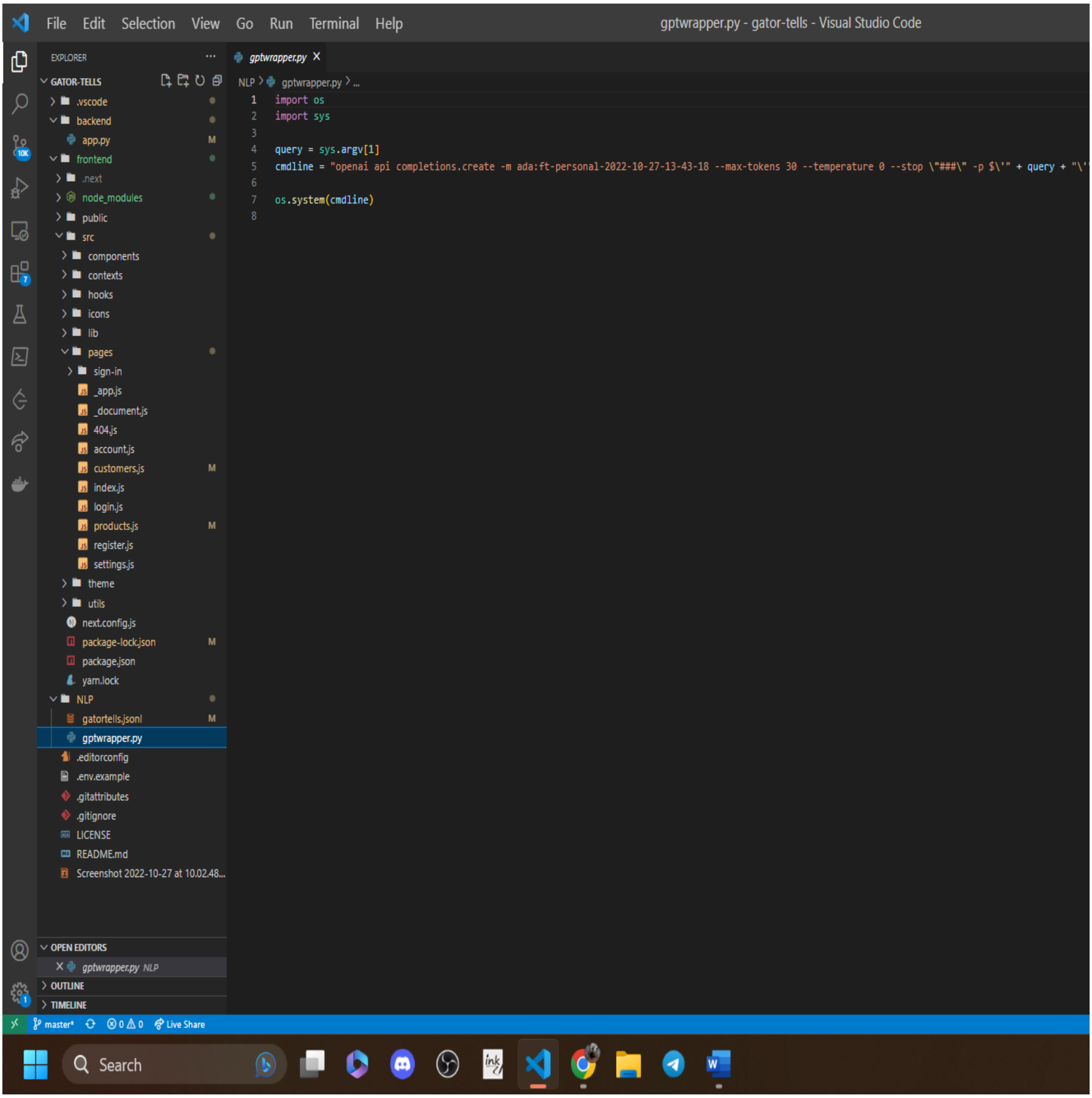
```
                    renderInput={(params) => (
                      <TextField {...params} label="Country" />
                    )}
                  />
                </Grid>
                <Grid item xs={6}>
                  <Autocomplete
                    disablePortal
                    id="combo-box-demo"
                    options={data?.indicator_name.map((c, i) => ({
                      label: c,
                      id: i,
                    }))}
                    onChange={(event, newValue) => {
                      setSelectedCountryIndicator(newValue?.label || '')
                    }}
                    value={selectedCountryIndicator}
                    renderInput={(params) => (
                      <TextField {...params} label="Indicator" />
                    )}
                  />
                </Grid>
              </Grid>
            </Container>
            <Container maxWidth={false}>
              <Typography color="textPrimary" variant="h4">
                {mode === "analysis" ? "Analysis of Sustainable Trend Queries" : "Forecasting of Sustainable Trend Queries"}
              </Typography>
              <Grid container spacing={3}>
                {data &&
                  !isLoading &&
                  Object.keys(chartData)?.map((indicator, i) => (
                    <Grid key={i} item lg={6} md={12} xl={9} xs={12}>
                      <Sales
                        indicator={indicator}
                        data={chartData[indicator].value}
                        year={chartData[indicator].year}
                      />
                    </Grid>
                  ))}
              </Grid>
            </Container>
          </>
        )}
      </Box>
    </>
  )
}

Page.getLayout = (page) => <DashboardLayout>{page}</DashboardLayout>

export default Page
```

Backend



```python
from flask import Flask, flash, render_template, request, redirect, url_for, session, jsonify
from flask_mysqldb import MySQL
import MySQLdb.cursors
from flask_cors import CORS, cross_origin

app = Flask(__name__)

app.config['MYSQL_HOST'] = 'localhost'
app.config['MYSQL_USER'] = 'root'
app.config["MYSQL_PASSWORD"]='Rajul@123'
app.config['MYSQL_DB'] = 'aidays'

mysql = MySQL(app)

cors = CORS(app)
app.config['CORS_HEADERS'] = 'Content-Type'

@app.route('/', methods=['GET'])
@app.route('/api/data', methods=['GET'])
@cross_origin()
def get_data():
    cur = mysql.connection.cursor()
    cur.execute('''select distinct CountryName from SDGData''')
    rv = cur.fetchall()
    # convert to list and flatten
    countries  = [item for t in rv for item in t]
    cur.execute('''select distinct IndicatorName from SDGData''')
    rv = cur.fetchall()
    # convert to list and flatten
    indicator_name  = [item for t in rv for item in t]
    return jsonify({'countries': countries, 'indicator_name': indicator_name})

@app.route('/api/data/chart', methods=['GET'])
@cross_origin()
def get_data_chart():
    # countru country and indicator from params
    country = request.args.get('country')
    indicator = request.args.get('indicator')
    cur = mysql.connection.cursor()
    rv = None
    if not indicator:
        cur.execute("select distinct IndicatorName, Year, Value from SDGData where CountryName = '{0}' and Value is not null".format(country))
        rv = cur.fetchall()
        # make data value for every IndicatorName
        data = {}
        for item in rv:
            if item[0] not in data:
                data[item[0]] = {'year': [], 'value': []}
            data[item[0]]['year'].append(item[1])
            data[item[0]]['value'].append(item[2])
        return jsonify(data)
    else:
        cur.execute("select distinct IndicatorName, Year, Value from SDGData where CountryName = '{0}' and IndicatorName = '{1}'".format(country, indicator))
        rv = cur.fetchall()
        data = {}
```

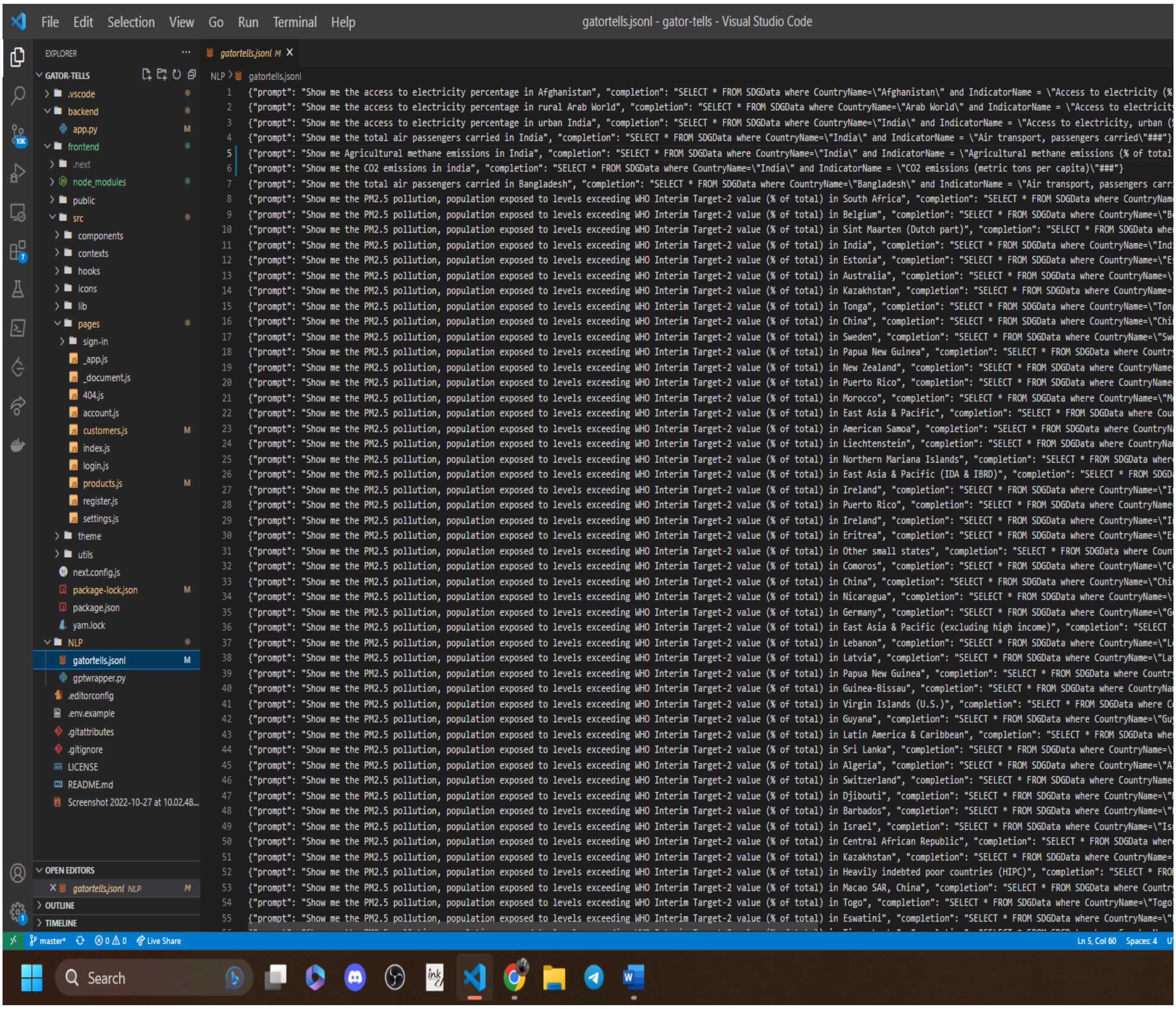
NLP



```python
import os
import sys

query = sys.argv[1]
cmdline = "openai api completions.create -m ada:ft-personal-2022-10-27-13-43-18 --max-tokens 30 --temperature 0 --stop \"###\" -p $\'" + query + "\'

os.system(cmdline)
```



```
{"prompt": "Show me the access to electricity percentage in Afghanistan", "completion": "SELECT * FROM SDGData where CountryName=\"Afghanistan\" and IndicatorName = \"Access to electricity (%
{"prompt": "Show me the access to electricity percentage in rural Arab World", "completion": "SELECT * FROM SDGData where CountryName=\"Arab World\" and IndicatorName = \"Access to electricity
{"prompt": "Show me the access to electricity percentage in urban India", "completion": "SELECT * FROM SDGData where CountryName=\"India\" and IndicatorName = \"Access to electricity, urban (
{"prompt": "Show me the total air passengers carried in India", "completion": "SELECT * FROM SDGData where CountryName=\"India\" and IndicatorName = \"Air transport, passengers carried\"###"}
{"prompt": "Show me Agricultural methane emissions in India", "completion": "SELECT * FROM SDGData where CountryName=\"India\" and IndicatorName = \"Agricultural methane emissions (% of total
{"prompt": "Show me the CO2 emissions in india", "completion": "SELECT * FROM SDGData where CountryName=\"India\" and IndicatorName = \"CO2 emissions (metric tons per capita)\"###"}
{"prompt": "Show me the total air passengers carried in Bangladesh", "completion": "SELECT * FROM SDGData where CountryName=\"Bangladesh\" and IndicatorName = \"Air transport, passengers carr
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in South Africa", "completion": "SELECT * FROM SDGData where CountryName
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Belgium", "completion": "SELECT * FROM SDGData where CountryName=\"Be
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Sint Maarten (Dutch part)", "completion": "SELECT * FROM SDGData whe
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in India", "completion": "SELECT * FROM SDGData where CountryName=\"Ind
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Estonia", "completion": "SELECT * FROM SDGData where CountryName=\"Es
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Australia", "completion": "SELECT * FROM SDGData where CountryName=\
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Kazakhstan", "completion": "SELECT * FROM SDGData where CountryName=
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Tonga", "completion": "SELECT * FROM SDGData where CountryName=\"Ton
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in China", "completion": "SELECT * FROM SDGData where CountryName=\"Chi
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Sweden", "completion": "SELECT * FROM SDGData where CountryName=\"Swe
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Papua New Guinea", "completion": "SELECT * FROM SDGData where Country
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in New Zealand", "completion": "SELECT * FROM SDGData where CountryName
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Puerto Rico", "completion": "SELECT * FROM SDGData where CountryName
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Morocco", "completion": "SELECT * FROM SDGData where CountryName=\"Mo
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in East Asia & Pacific", "completion": "SELECT * FROM SDGData where Cou
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in American Samoa", "completion": "SELECT * FROM SDGData where CountryNa
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Liechtenstein", "completion": "SELECT * FROM SDGData where CountryNa
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Northern Mariana Islands", "completion": "SELECT * FROM SDGData where
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in East Asia & Pacific (IDA & IBRD)", "completion": "SELECT * FROM SDGDa
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Ireland", "completion": "SELECT * FROM SDGData where CountryName=\"Ir
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Puerto Rico", "completion": "SELECT * FROM SDGData where CountryName
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Ireland", "completion": "SELECT * FROM SDGData where CountryName=\"Ir
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Eritrea", "completion": "SELECT * FROM SDGData where CountryName=\"Er
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Other small states", "completion": "SELECT * FROM SDGData where Coun
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Comoros", "completion": "SELECT * FROM SDGData where CountryName=\"Co
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in China", "completion": "SELECT * FROM SDGData where CountryName=\"Chi
{"prompt": "Show me the PM2.5 pollution, population exposed to levels exceeding WHO Interim Target-2 value (% of total) in Nicaragua", "completion": "SELECT * FROM SDGData where CountryName=\
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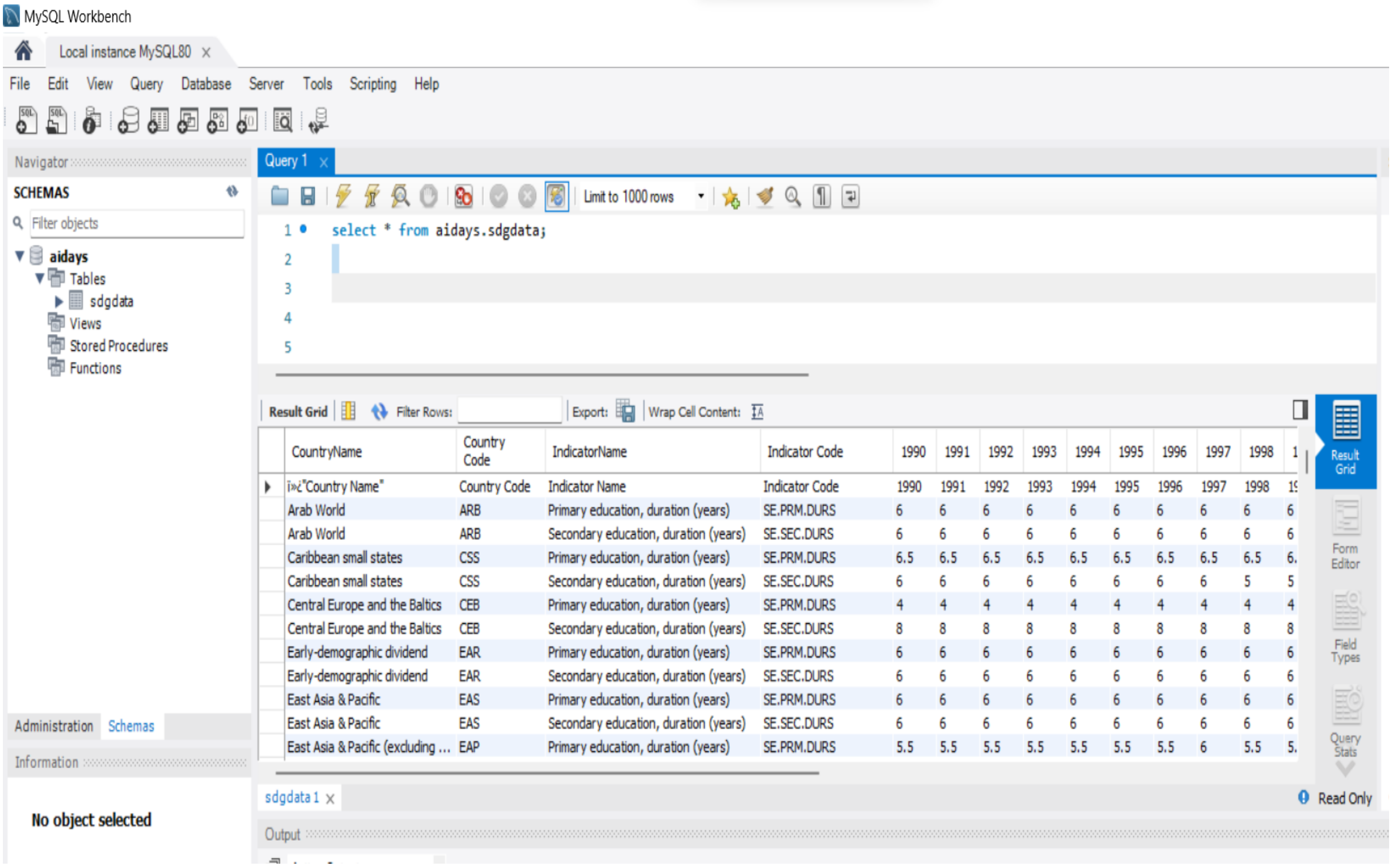
DATABASE



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Arab World	ARB	Secondary education, duration (years)	SE.SEC.DURS	6	6	6	6	6	6	6	6	6	6
Caribbean small states	CSS	Primary education, duration (years)	SE.PRM.DURS	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.
Caribbean small states	CSS	Secondary education, duration (years)	SE.SEC.DURS	6	6	6	6	6	6	6	6	5	5
Central Europe and the Baltics	CEB	Primary education, duration (years)	SE.PRM.DURS	4	4	4	4	4	4	4	4	4	4
Central Europe and the Baltics	CEB	Secondary education, duration (years)	SE.SEC.DURS	8	8	8	8	8	8	8	8	8	8
Early-demographic dividend	EAR	Primary education, duration (years)	SE.PRM.DURS	6	6	6	6	6	6	6	6	6	6
Early-demographic dividend	EAR	Secondary education, duration (years)	SE.SEC.DURS	6	6	6	6	6	6	6	6	6	6
East Asia & Pacific	EAS	Primary education, duration (years)	SE.PRM.DURS	6	6	6	6	6	6	6	6	6	6
East Asia & Pacific	EAS	Secondary education, duration (years)	SE.SEC.DURS	6	6	6	6	6	6	6	6	6	6
East Asia & Pacific (excluding ...	EAP	Primary education, duration (years)	SE.PRM.DURS	5.5	5.5	5.5	5.5	5.5	5.5	5.5	6	5.5	5.

TESTING

TESTING :

Software testing is the process of evaluating and verifying that a software product or application does what it is supposed to do. The benefits of testing include preventing bugs, reducing development costs and improvingperformance.

Types of software testing

There are many different types of software tests, each with specific objectivesand strategies:

- **Acceptance testing:** Verifying whether the whole system works as intended.
- **Integration testing:** Ensuring that software components or functions operate together.
- **Unit testing:** Validating that each software unit performs as expected. A unit is the smallest testable component of an application.
- **Functional testing:** Checking functions by emulating business scenarios, based on functional requirements. Black-box testing is a common way to verify functions.
- **Performance testing:** Testing how the software performs under different workloads. Load testing, for example, is used to evaluate performance under real-life load conditions.
- **Regression testing:** Checking whether new features break or degrade functionality. Sanity testing can be used to verify menus, functions and commands at the surface level, when there is no time for a full regression test.
- **Stress testing:** Testing how much strain the system can take before it fails. Considered to be a type of non-functional testing.
- **Usability testing:** Validating how well a customer can use a system or web application to complete a task.

In each case, validating base requirements is a critical assessment. Just as important, exploratory testing helps a tester or testing team uncover hard-to- predict scenarios and situations that can lead to software errors.

Even a simple application can be subject to a large number and variety of tests.A test management plan helps to prioritize which types of testing provide the most value – given available time and resources. Testing effectiveness is optimized by running the fewest number of tests to find the largest number of defects.

History of software testing

Software testing arrived alongside the development of software, which had its beginnings just after the second world war. Computer scientist Tom Kilburn is credited with writing the first piece of software, which debuted on June 21, 1948, at the University of Manchester in England. It performed mathematical calculations using machine code instructions.

Debugging was the main testing method at the time and remained so for the next two decades. By the 1980s, development teams looked beyond isolating and fixing software bugs to testing applications in real-world settings. It set the stage for a broader view of testing, which encompassed a quality assurance process that was part of the software development life cycle.

“Testing had reached a qualitatively new level, which led to the further development of methodologies, the emergence of powerful tools for managing the testing process and test automation tools.” 1

CONTINUOUS TESTING

Software testing has traditionally been separated from the rest of development. It is often conducted later in the software development life cycle after the product build or execution stage. A tester may only have a small window to test the code
– sometimes just before the application goes to market. If defects are found,there may be little time for recoding or retesting. It is not uncommon to release software on time, but with bugs and fixes needed. Or a testing team may fix errors but miss a release date.

Doing test activities earlier in the cycle helps keep the testing effort at the forefront rather than as an afterthought to development. Earlier software tests also mean that defects are less expensive to resolve.

Many development teams now use a methodology known as continuous testing. It is part of a DevOps approach – where development and operations collaborate over the entire product life cycle. The aim is to accelerate software delivery while balancing cost, quality and risk. With this testing technique, teams don’t need to

wait for the software to be built before testing starts. They can run tests much earlier in the cycle to discover defects sooner, when they are easier to fix.
Software development

WHY SOFTWARE TESTING IS IMPORTANT

Few can argue against the need for quality control when developing software. Late delivery or software defects can damage a brand's reputation — leading to frustrated and lost customers. In extreme cases, a bug or defect can degrade interconnected systems or cause serious malfunctions.

Consider Nissan having to recall over 1 million cars due to a software defect in the airbag sensor detectors. Or a software bug that caused the failure of a USD 1.2 billion military satellite launch. 2 The numbers speak for themselves. Software failures in the US cost the economy USD 1.1 trillion in assets in 2016. What's more, they impacted 4.4 billion customers. 3

Though testing itself costs money, companies can save millions per year in development and support if they have a good testing technique and QA processes in place. Early software testing uncovers problems before a product goes to market. The sooner development teams receive test feedback, the sooner they can address issues such as:

- Architectural flaws
- Poor design decisions
- Invalid or incorrect functionality
- Security vulnerabilities
- Scalability issues

When development leaves ample room for testing, it improves software reliability and high-quality applications are delivered with few errors. A system that meets or even exceeds customer expectations leads to potentially more sales and greater market share.

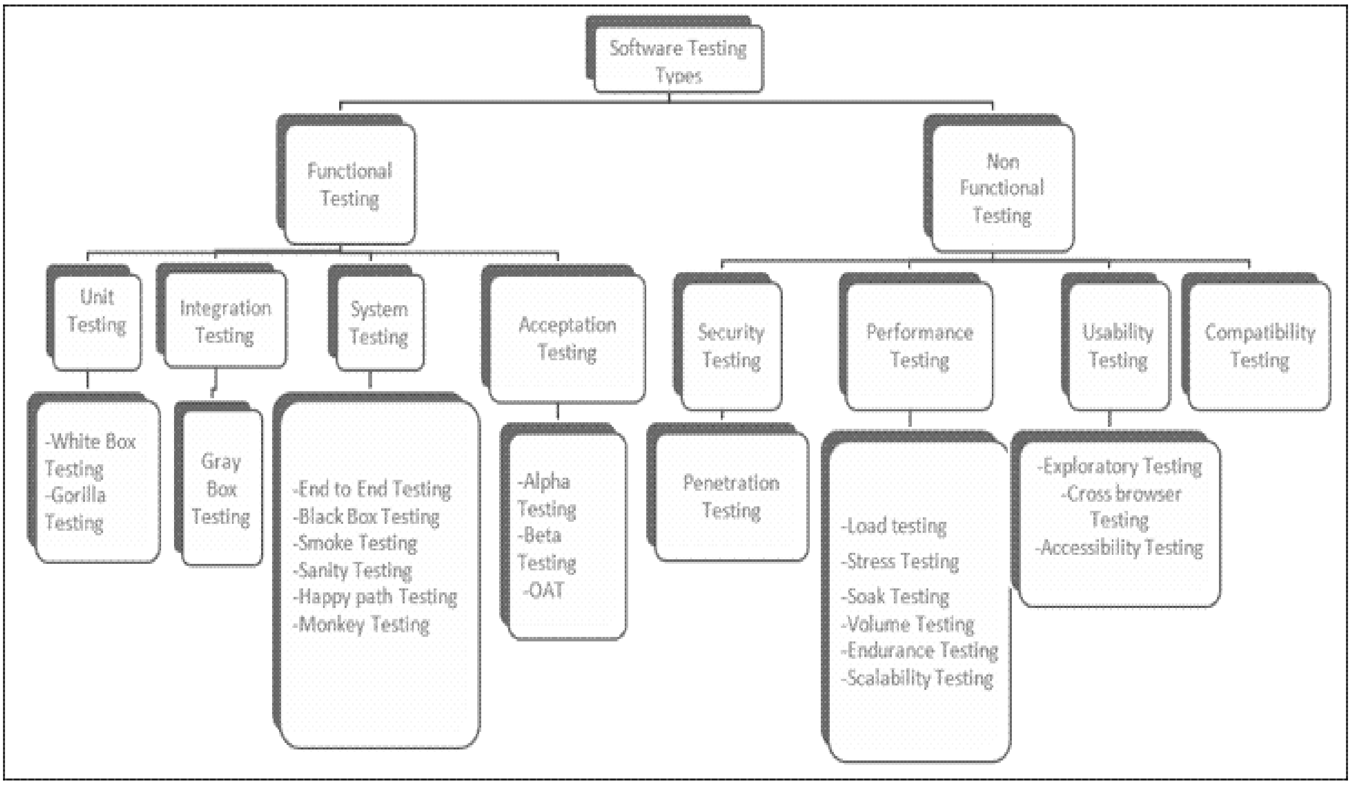
Software testing best practices

Software testing follows a common process. Tasks or steps include defining the test environment, developing test cases, writing scripts, analyzing test results and submitting defect reports.

Testing can be time-consuming. Manual testing or ad-hoc testing may be enough for small builds. However, for larger systems, tools are frequently used to automate tasks. Automated testing helps teams implement different scenarios, test differentiators (such as moving components into a cloud environment), and quickly get feedback on what works and what doesn't.

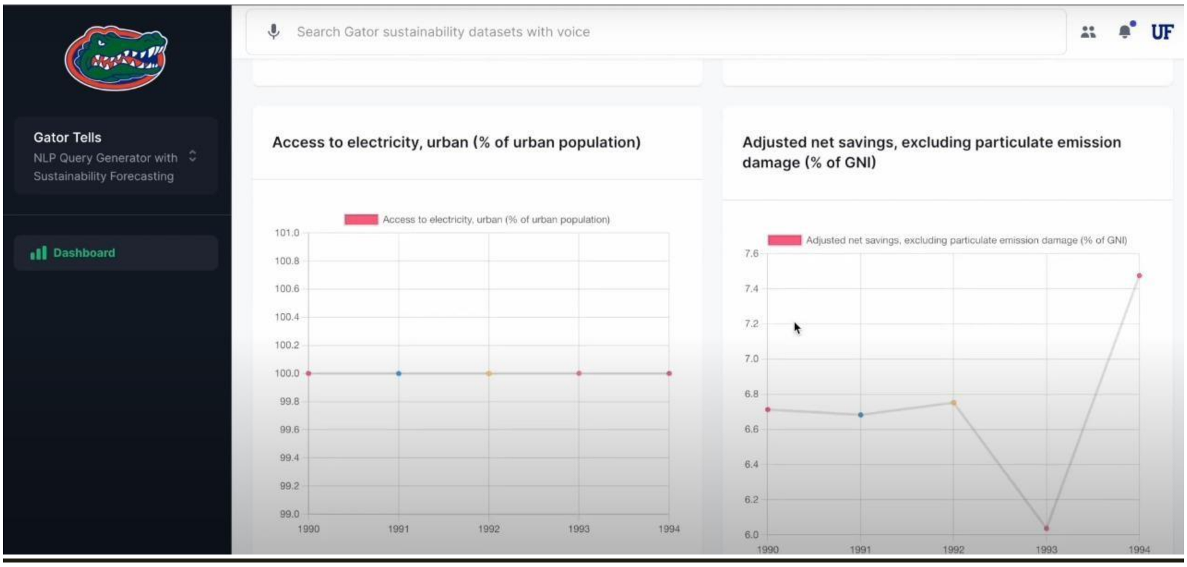
A good testing approach encompasses the application programming interface (API), user interface and system levels. As well, the more tests that are automated, and run early, the better. Some teams build in-house test automation tools. However, vendor solutions offer features that can streamline key test management tasks such as:

- **Continuous testing:** Project teams test each build as it becomes available. This type of software testing relies on test automation that is integrated with the deployment process. It enables software to be validated in realistic test environments earlier in the process – improving design and reducing risks.
- **Configuration management:** Organizations centrally maintain test assets and track what software builds to test. Teams gain access to assets such as code, requirements, design documents, models, test scripts and test results. Good systems include user authentication and audit trails to help teams meet compliance requirements with minimal administrative effort.
- **Service virtualization:** Testing environments may not be available, especially early in code development. Service virtualization simulates the services and systems that are missing or not yet completed, enabling teams to reduce dependencies and test sooner. They can reuse, deploy and change a configuration to test different scenarios without having to modify the original environment.
- **Defect or bug tracking:** Monitoring defects is important to both testing and development teams for measuring and improving quality. Automated tools allow teams to track defects, measure their scope and impact, and uncover related issues.
- **Metrics and reporting:** Reporting and analytics enable team members to share status, goals and test results. Advanced tools integrate project metrics and present results in a dashboard. Teams quickly see the overall health of a project and can monitor relationships between test, development and other project elements.


Software Testing Types
Functional Testing
Non Functional Testing
Unit Testing
Integration Testing
System Testing
Acceptation Testing
Security Testing
Performance Testing
Usability Testing
Compatibility Testing
-White Box Testing
-Gorilla Testing
Gray Box Testing
-End to End Testing
-Black Box Testing
-Smoke Testing
-Sanity Testing
-Happy path Testing
-Monkey Testing
-Alpha Testing
-Beta Testing
-OAT
Penetration Testing
-Load testing
-Stress Testing
-Soak Testing
-Volume Testing
-Endurance Testing
-Scalability Testing
-Exploratory Testing
-Cross browser Testing
-Accessibility Testing

OUTPUT

OUTPUT :



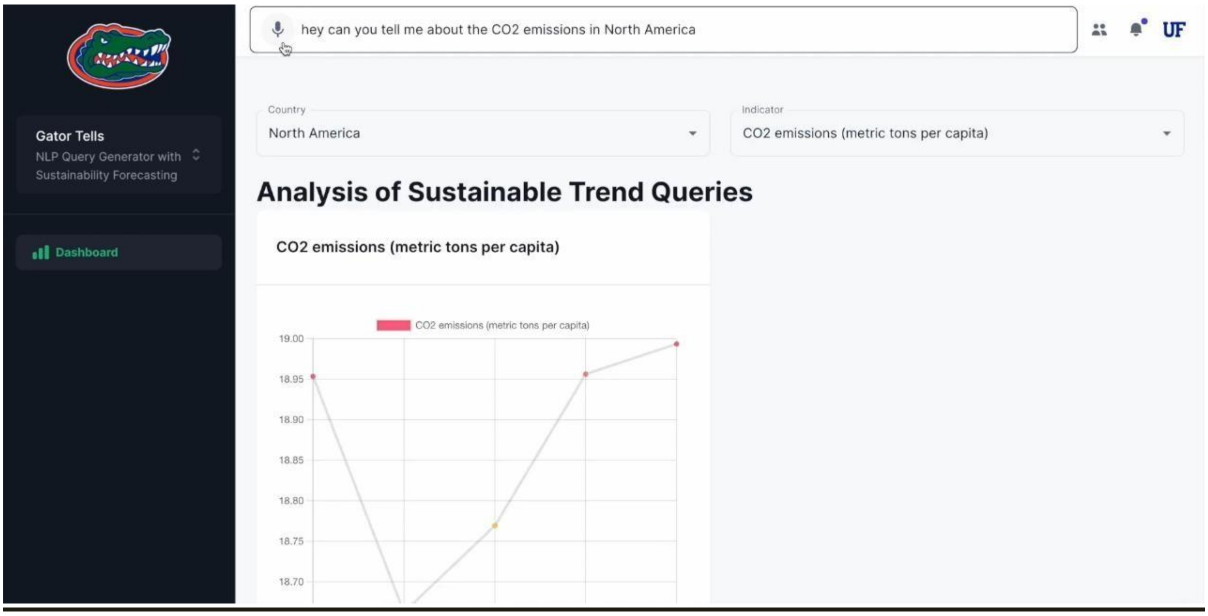
Search Gator sustainability datasets with voice

Gator Tells

NLP Query Generator with Sustainability Forecasting

Access to electricity, urban (% of urban population)

Adjusted net savings, excluding particulate emission damage (% of GNI)



hey can you tell me about the CO2 emissions in North America

Gator Tells

NLP Query Generator with Sustainability Forecasting

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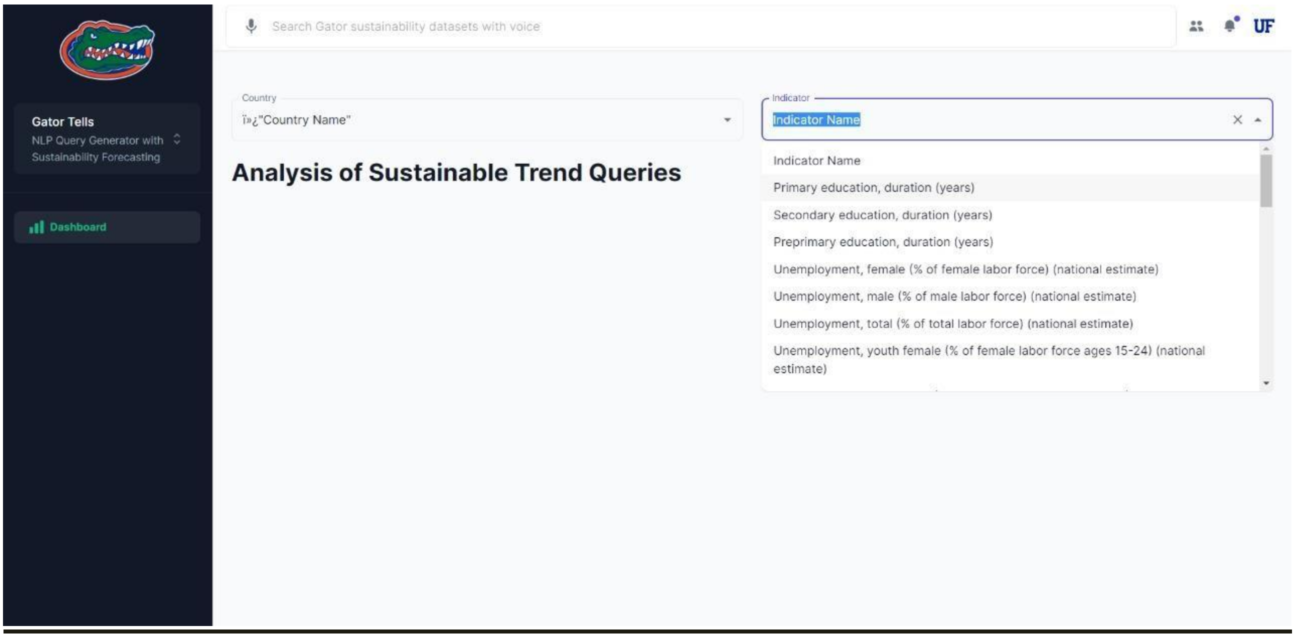
Indicator: CO2 emissions (metric tons per capita)

Analysis of Sustainable Trend Queries

CO2 emissions (metric tons per capita)


Search Gator sustainability datasets with voice
UF
Gator Tells
NLP Query Generator with Sustainability Forecasting
Dashboard
Indicator Name
Primary education, duration (years)
Secondary education, duration (years)
Preprimary education, duration (years)
Unemployment, female (% of female labor force) (national estimate)
Unemployment, male (% of male labor force) (national estimate)
Unemployment, total (% of total labor force) (national estimate)
Unemployment, youth female (% of female labor force ages 15-24) (national estimate)

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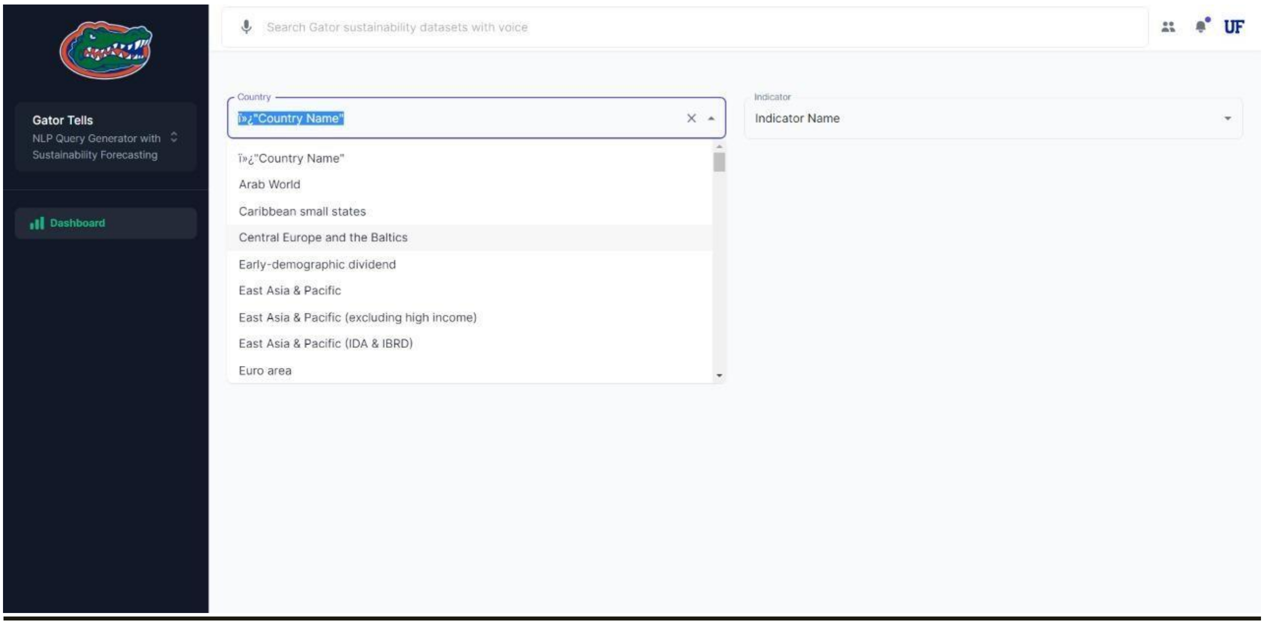
Indicator: Indicator Name

Analysis of Sustainable Trend Queries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UF
Gator Tells
NLP Query Generator with Sustainability Forecasting
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ï»¿"Country Name"
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Caribbean small states
Central Europe and the Baltics
Early-demographic dividend
East Asia & Pacific
East Asia & Pacific (excluding high income)
East Asia & Pacific (IDA & IBRD)
Euro area

Country: ï»¿"Country Name"

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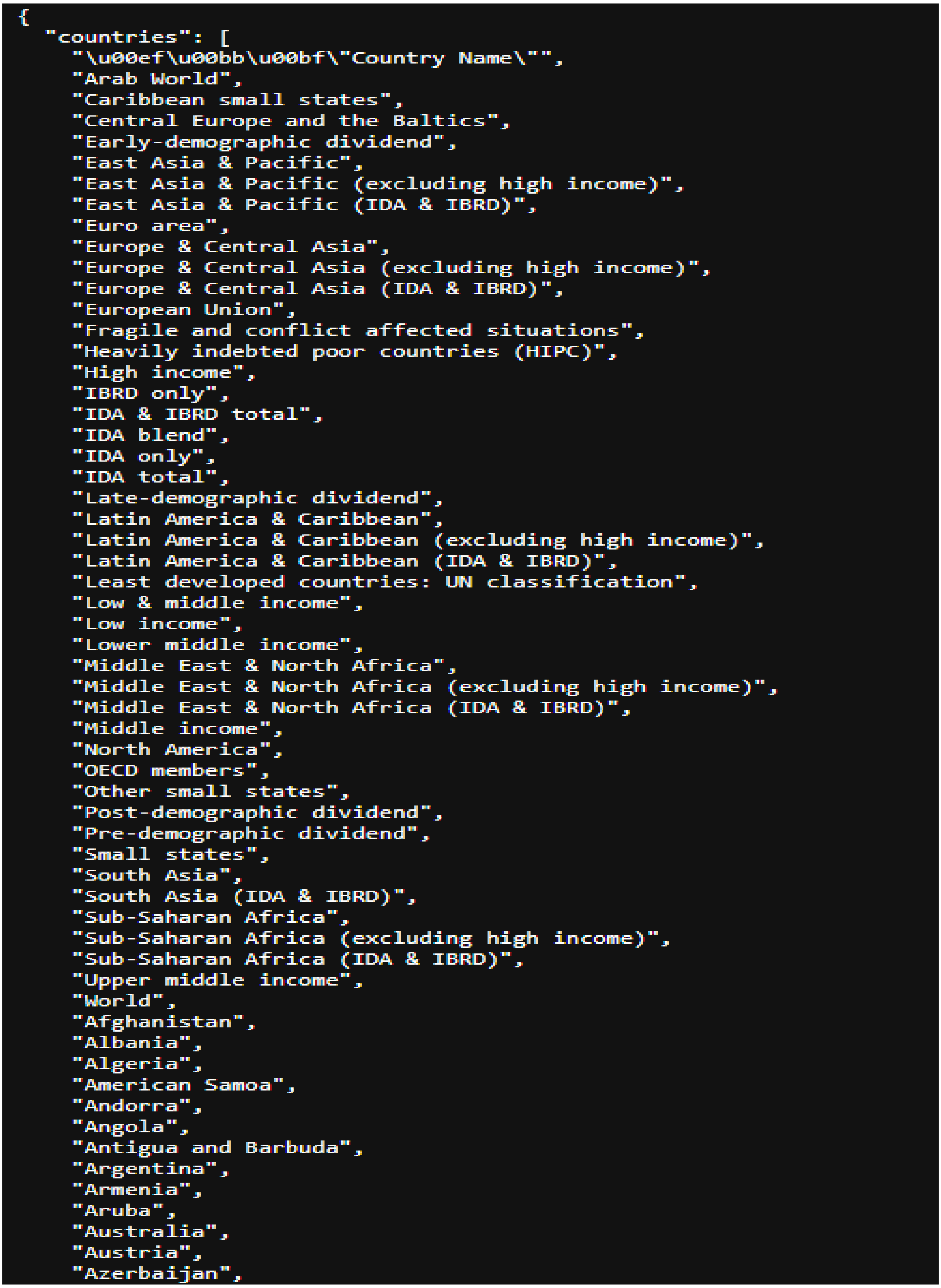

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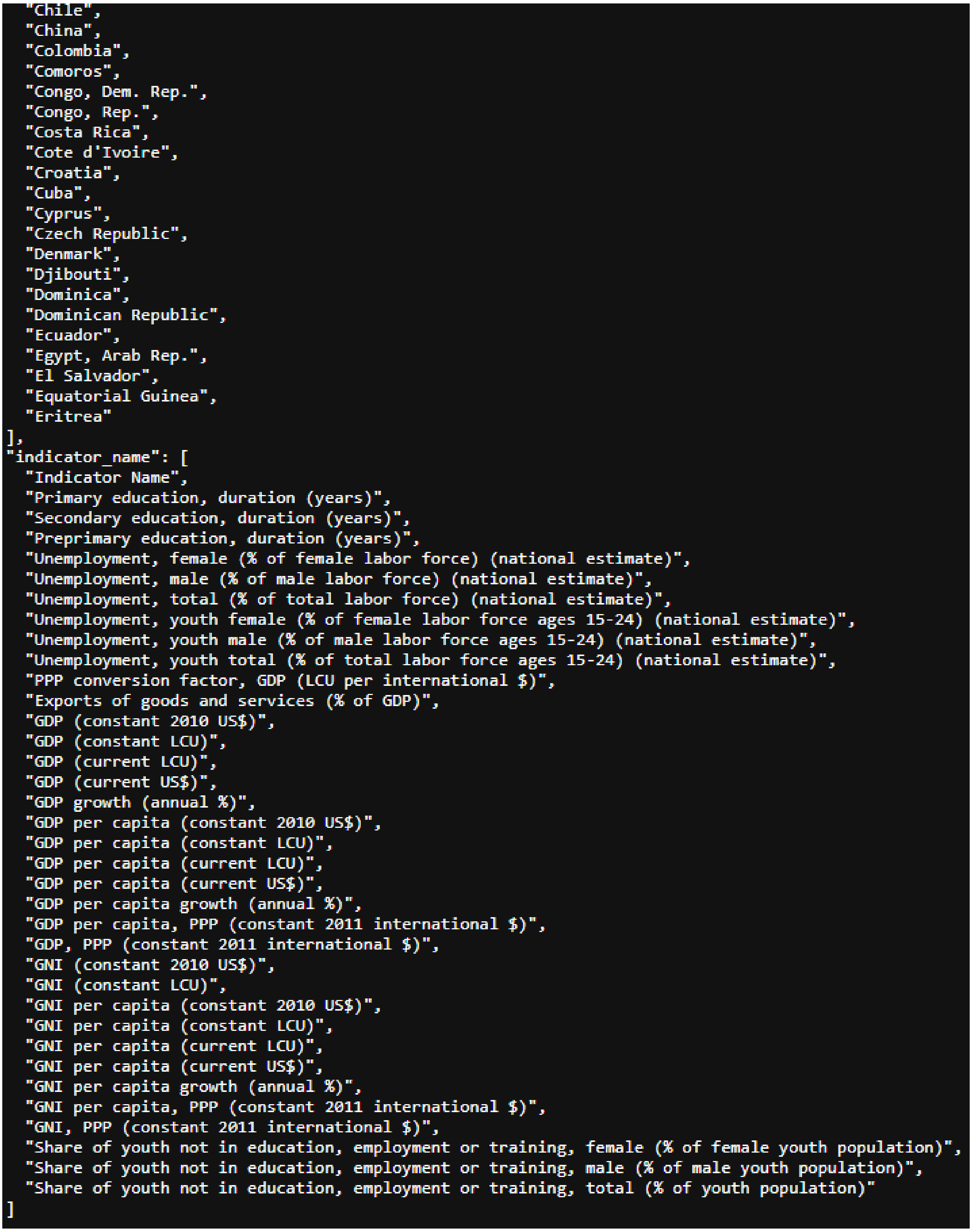

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SWOT ANALYSIS

SWOT ANALYSIS

□Strength-

- To know the customer requirement, need and also used for scaling the business.

□Weakness-

- To Understand the graphs so basic training reqired.

□Opportunity-

- Develop a social media website for businesses world all around theglobe where they can show their wanderlust.

□Threats-

- As it is only for business purpose so people can add fake responseon the sites which will make the analysis wrong.

REFERENCES

REFERENCES:

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- ✓ www.engineeringbooks.me/
- ✓ www.w3schools.com/
- ✓ www.tutorialspoint.com/
- ✓ pythonbasics.org/what-is-flask-python/
- ✓ data.worldbank.org/

GITHUB LINK

https://github.com/rajulkoshta/TELLS---WEB-Visualiser