Personal Blog on IBM Cloud Static Web App

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Project Title: Personal Travel blog

Phase 5: Project Documentation & Submission

Objective:

The primary objective of the personal blog, hosted on the IBM Cloud as a static web app, is to share the passion for the travel and adventure while demonstrating the capabilities of IBM Cloud for hosting static websites.

Description:

I have created the Personal Travel Blog Website by integrating Flask to specifically handle the Routes, Templates, Static files and to connect with the DB2 Database from the IBM Cloud then used Docker to containerize the application then Kubernetes was used to manage the container.

This project centers around the creation of a high-performance Personal Travel Blog Website that incorporates cutting-edge technologies to deliver an exceptional user experience. Flask, a powerful Python web framework, is utilized to handle routes, serve templates, and interact with an IBM Cloud DB2 database, ensuring efficient content delivery and data management.

To guarantee a consistent and reliable deployment, Docker is employed to containerize the Flask application, encapsulating all dependencies and configurations. This containerized application is then orchestrated and managed using Kubernetes, a container orchestration platform, to ensure scalability, availability, and ease of management.

Design Thinking:

Blog's Structure:

Determine the categories and sections for the blog, such as travel stories, tips, photos, and maps.

Plan to organize and present your content. Also, should consider creating a user-friendly navigation menu.

Content Planning:

Outline the initial content ideas. Should decide on the number of travel stories, the topics for travel tips, and the format for sharing photos.

Locations and experiences that want to cover in the travel stories must be identified.

Content Creation:

Start to create the travel stories, tips, and curate high-quality photos from your journeys.

Write engaging and informative content that resonates with the target audience.

Make sure the content is well-researched, accurate, and free from grammatical errors.

Consider incorporating a personal touch or storytelling element to make the blog unique.

Website Design:

Design an aesthetically pleasing and user-friendly layout for your blog. HTML and CSS can be used to create the design.

Consider using JavaScript for interactive elements, such as image sliders, maps, or contact forms.

Ensure the website is responsive and mobile-friendly to accommodate users on various devices.

Content Management System (CMS):

Develop a web interface for managing blog content using Flask. Implement features for creating and updating blog posts.

Blog Testing and Optimization:

Thoroughly test the blog for usability, performance, and security.

Optimize images and content for faster loading times.

Implement SEO best practices to improve your blog's visibility on search engines.

Content Publishing:

Start publishing the travel stories, tips, and photos on the blog.

Ensure that the content is well-organized and easy to navigate.

Encourage user engagement through comments and social media sharing options.

Set up IBM Cloud and DB2:

Sign up for an IBM Cloud account.

Create an instance of IBM Db2 on Cloud. This will serve as your database for storing blog data.

Should Follow IBM Cloud's documentation to set up a Web App. This will involve configuring your domain, uploading your website files, and setting up any necessary security measures (e.g., SSL certificates).

Develop the Flask Application:

Create a Python Flask application for the blog. VS code editor or an integrated development environment (IDE) to write the Flask application.

Use Flask-SQLAlchemy to connect your Flask application to the IBM DB2 database. Configure the connection settings.

Define Database Schema:

Define the database schema, including tables for blog posts, user data, and any other necessary data structures.

Create models using SQLAlchemy to represent these tables in your Flask application.

Create APIs and Routes:

Develop API endpoints and routes for creating, reading, updating, and deleting blog posts.

Implement user authentication and authorization for managing and publishing content.

Build the Docker Image:

Write a Dockerfile to specify how your Flask application should be containerized.

Build a Docker image of your Flask application.

Push the Docker Image to a Registry:

Set up an account with a container registry service (e.g., Docker Hub or IBM Container Registry).

Push the Docker image to the container registry.

Set Up Kubernetes Cluster:

Create or use an existing Kubernetes cluster in the IBM Cloud environment.

Install the Kubernetes command-line tools (kubectl) and configure them to connect to the cluster.

Create Kubernetes Deployment:

Write Kubernetes YAML files to define the deployment, services, and other resources for your Flask application.

Use these YAML files to create the Kubernetes deployment.

Expose the Service:

Expose your Flask application to the internet by creating a Kubernetes service with a LoadBalancer or NodePort type.

Obtain the external IP address or domain name for the service.

Overview:

Content Planning and Creation:

Before diving into technical aspects, it is essential to plan the content for the travel blog, then need to create engaging travel stories, share useful travel tips, and curate captivating photos from the journey. These are the heart of your blog and what will inspire others to explore the world.

Website Design:

For the blog's layout, need to design an aesthetically pleasing and user-friendly website. This involves creating web pages using HTML for content structure, CSS for styling, and possibly JavaScript for interactive elements like image galleries or maps showing the places they have visited. This design thinking aspect ensures that your blog is visually appealing and provides a great user experience.

IBM Cloud Setup:

To host the travel blog, need to set up an account on IBM Cloud. IBM Cloud offers a variety of services, including IBM Db2 Cloud. This service allows to store the data for the websites, which is suitable for a blog. Using that can deploy the HTML, CSS, and JavaScript files to the IBM Cloud's Static Web Apps service.

Content Management:

For efficient content management, I have chosen Flask and IBM Db2 Cloud.

Flask: Flask is a micro web framework for Python. It can use it to create dynamic and interactive web pages. In this case, Flask can be used to manage the blog content. It can create templates for the blog posts and use Flask to render them with dynamic content. Flask can also handle routing, making it easy to organize the content and create a structured blog.

IBM Db2 Cloud: IBM Db2 is a database management system. By integrating it into the Flask application, it can store and manage data related to the travel blog. This can include information about the visited places, tips, user comments, and more. With Db2 Cloud, the data is stored securely and can be easily retrieved and updated through your Flask application.

The content management aspect involves using Flask to create and serve your blog content dynamically. You can use templates to ensure a consistent design, and Flask can communicate with the IBM Db2 Cloud to fetch and update data as needed. This setup enables you to easily add, edit, or delete blog posts and manage your blog's data

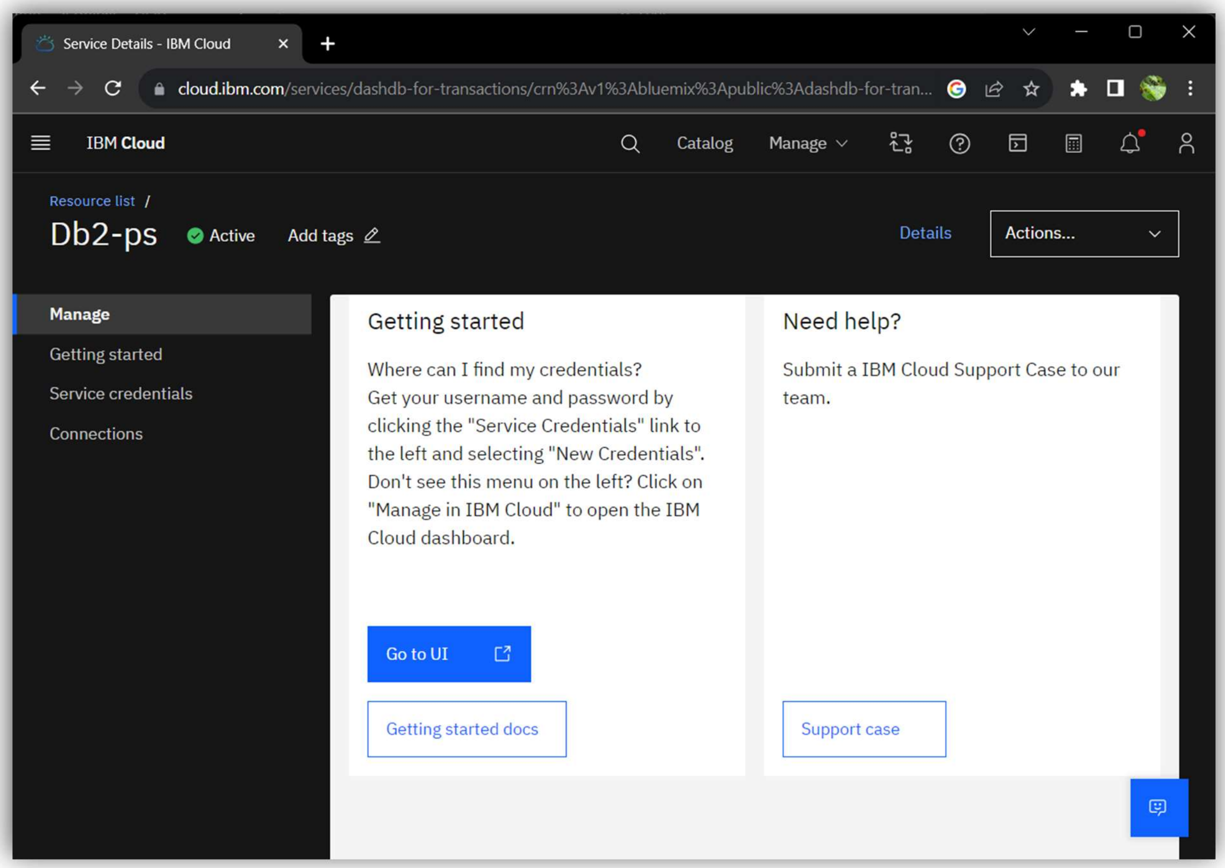
IBM Cloud:

IBM Cloud is a cloud computing platform offered by IBM. It provides a range of cloud services, including infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS) offerings.

After signing up and logging in, create a Db2 service instance. Db2 is IBM's database management system that offers relational database capabilities.

In the IBM Cloud dashboard, go to the “Catalog” and search for “Db2.” Choose the plan that suits your needs.

Follow the on-screen instructions to create the Db2 service.



Where can I find my credentials? Get your username and password by clicking the "Service Credentials" link to the left and selecting "New Credentials". Don't see this menu on the left? Click on "Manage in IBM Cloud" to open the IBM Cloud dashboard.

Submit a IBM Cloud Support Case to our team.

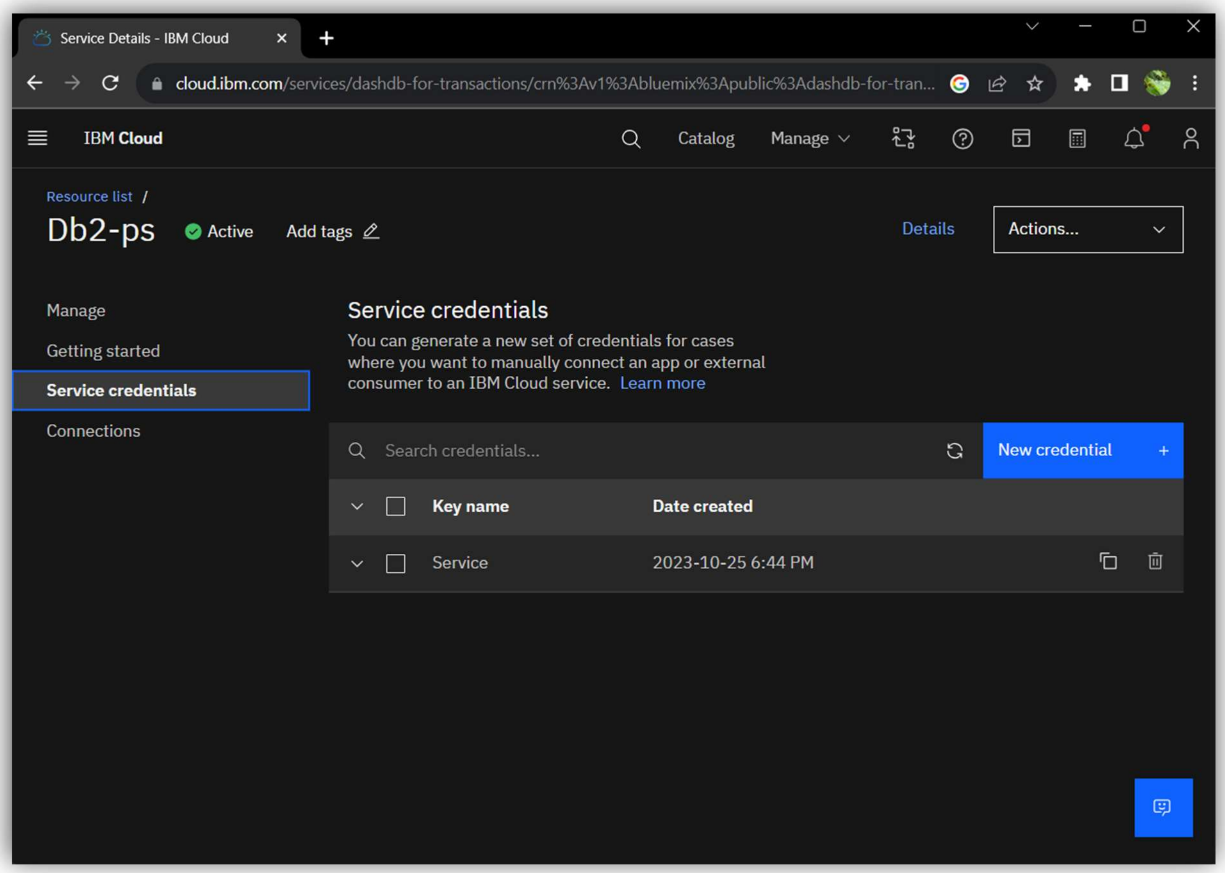
Fig-1: DB2 in IBM Cloud

Connecting to Db2:

Once your Db2 service is created, you can connect to it using various methods. IBM provides drivers and libraries for various programming languages to interact with Db2. You can use these drivers in your Flask application to connect to your Db2 service hosted in IBM Cloud.

Install Required Libraries:

Use the ibm_db Python library to connect to IBM Db2 from your Flask application. You can install it with pip as mentioned in a previous response.


Service Details - IBM Cloud

cloud.ibm.com/services/dashdb-for-transactions/crn%3Av1%3Abluemix%3Apublic%3Adashdb-for-tran...

IBM Cloud

Resource list /

Db2-ps Active Add tags

Service credentials

You can generate a new set of credentials for cases where you want to manually connect an app or external consumer to an IBM Cloud service. Learn more

Key name	Date created
Service	2023-10-25 6:44 PM

Fig-2: Service Credentials in IBM Cloud

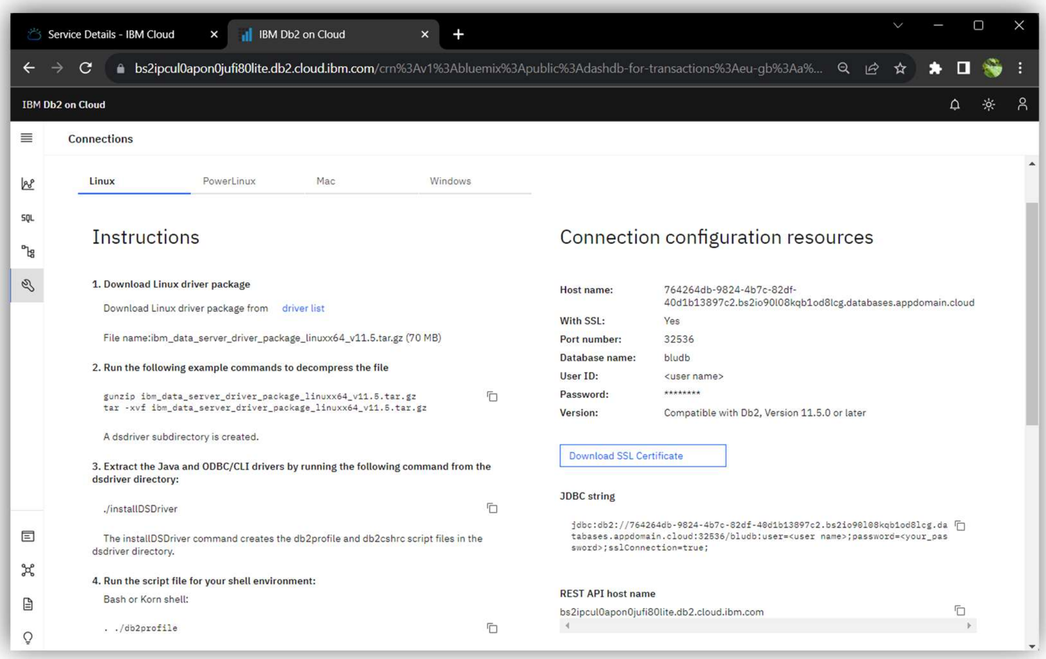
Set Up Db2 Connection:

In the Flask application (app.py), set up a connection to the Db2 database using the credentials provided by your Db2 service on IBM Cloud.

The connection details include the hostname, port, database name, username, and password. You typically fetch these details from environment variables or configuration files.

Perform Database Operations:

With a successful Db2 connection, you can execute SQL queries and perform database operations in your Flask application. For example, you can retrieve data, insert records, and update the database.



Instructions

1. Download Linux driver package

Download Linux driver package from driver list

File name:ibm_data_server_driver_package_linuxx64_v11.5.tar.gz (70 MB)

2. Run the following example commands to decompress the file

```
gunzip ibm_data_server_driver_package_linuxx64_v11.5.tar.gz
tar -xvf ibm_data_server_driver_package_linuxx64_v11.5.tar.gz
```

A dsdriver subdirectory is created.

3. Extract the Java and ODBC/CLI drivers by running the following command from the dsdriver directory:

```
./installDSDriver
```

The installDSDriver command creates the db2profile and db2cshrc script files in the dsdriver directory.

4. Run the script file for your shell environment:

Bash or Korn shell:

```
. ./db2profile
```

Connection configuration resources

Host name:	764264db-9824-4b7c-82df-40d1b13897c2.bs2io90l08kqb1od8lcg.databases.appdomain.cloud
With SSL:	Yes
Port number:	32536
Database name:	bludb
User ID:	<user name>
Password:	********
Version:	Compatible with Db2, Version 11.5.0 or later

JDBC string

```
jdbc:db2://764264db-9824-4b7c-82df-40d1b13897c2.bs2io90l08kqb1od8lcg.da
tabases.appdomain.cloud:32536/bludb:user=<user name>;password=<your_pas
sword>;sslConnection=true;
```

REST API host name

bs2ipcul0apon0jufi80lite.db2.cloud.ibm.com

Fig-3: Connection Details for the DB2

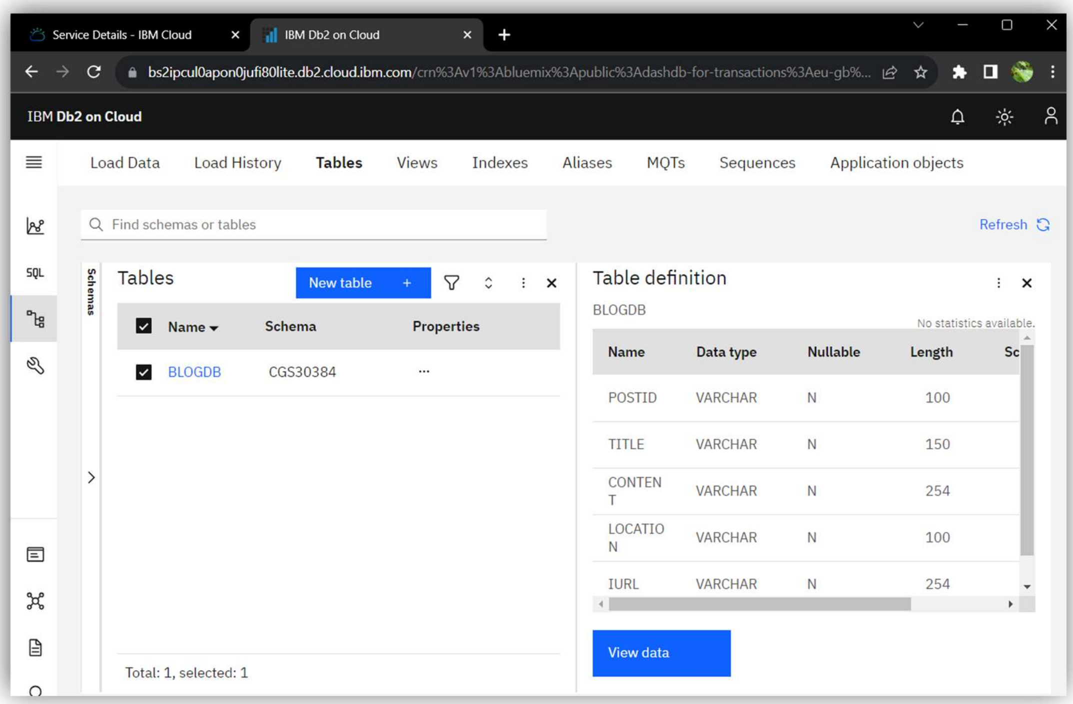


Table definition

BLOGDB

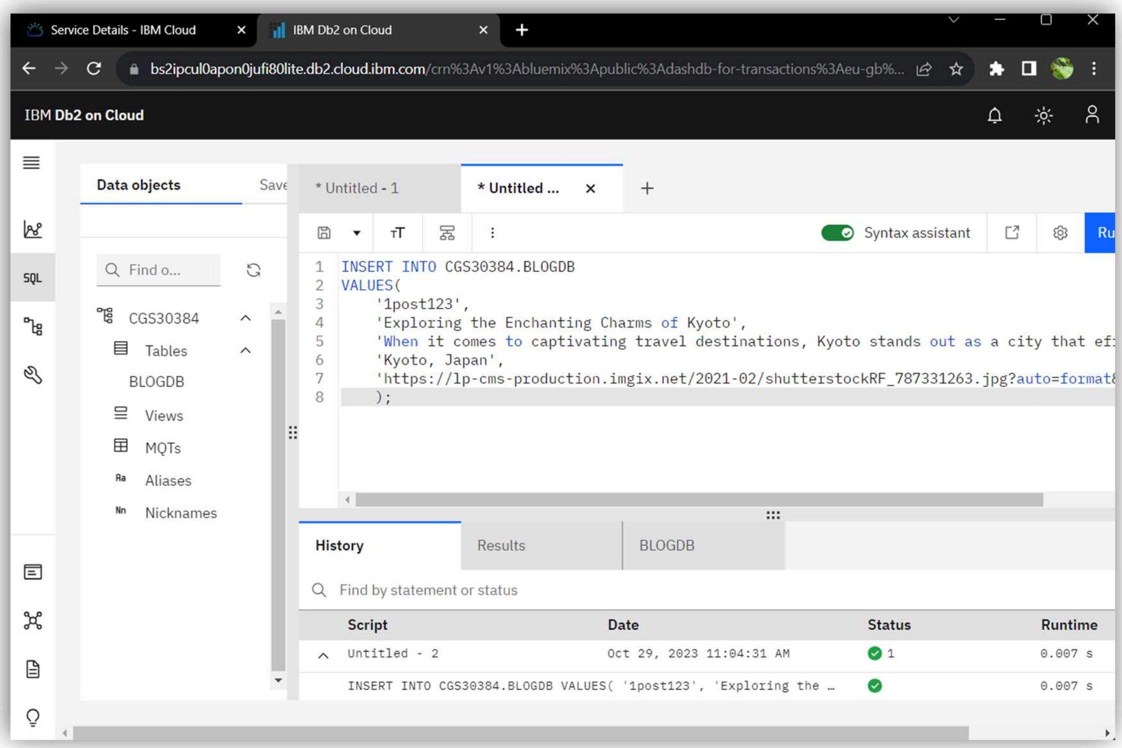
No statistics available.

Name	Data type	Nullable	Length
POSTID	VARCHAR	N	100
TITLE	VARCHAR	N	150
CONTENT	VARCHAR	N	254
LOCATION	VARCHAR	N	100
IURL	VARCHAR	N	254

Name	Schema	Properties
BLOGDB	CGS30384	...

Total: 1, selected: 1

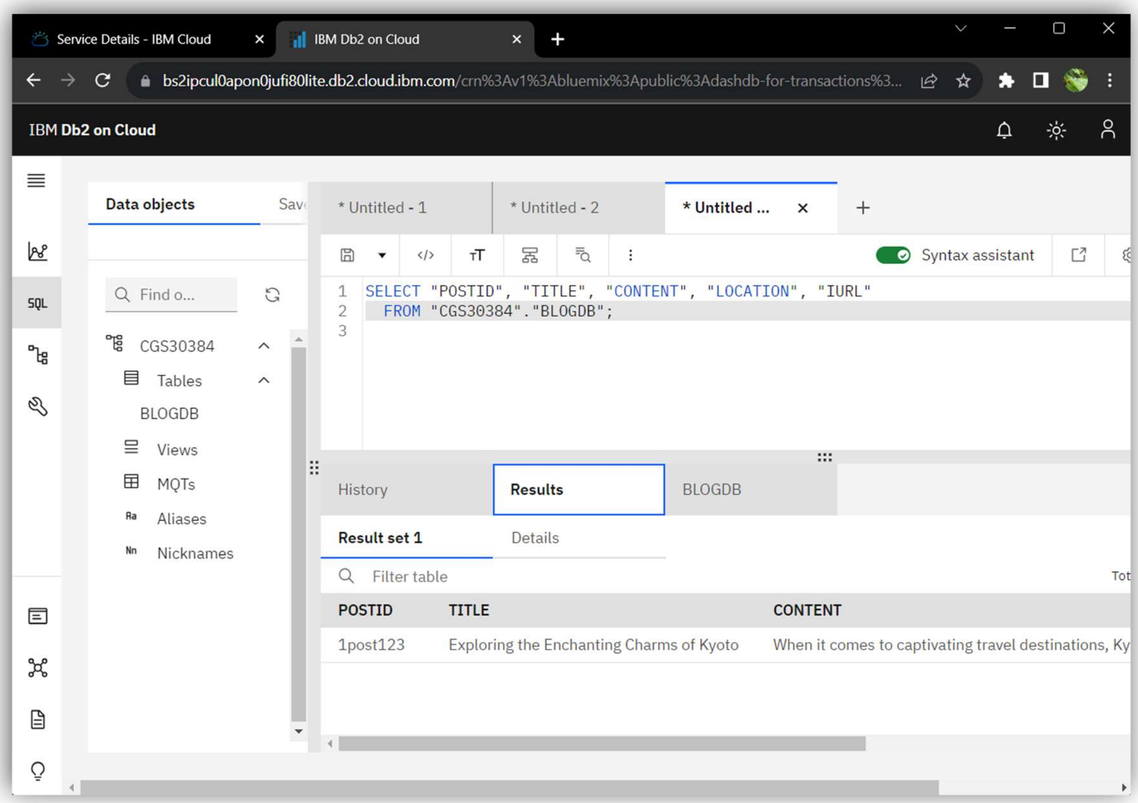
Fig-4: Table for the DB storage



```
INSERT INTO CGS30384.BLOGDB
VALUES(
    '1post123',
    'Exploring the Enchanting Charms of Kyoto',
    'When it comes to captivating travel destinations, Kyoto stands out as a city that ef
    'Kyoto, Japan',
    'https://lp-cms-production.imgix.net/2021-02/shutterstockRF_787331263.jpg?auto=format&
    );
```

Script	Date	Status	Runtime
Untitled - 2	Oct 29, 2023 11:04:31 AM	✓ 1	0.007 s
INSERT INTO CGS30384.BLOGDB VALUES('1post123', 'Exploring the …		✓	0.007 s

Fig-5: Testing – Inserting a post to the table using SQL



```
SELECT "POSTID", "TITLE", "CONTENT", "LOCATION", "IURL"
  FROM "CGS30384"."BLOGDB";
```

POSTID	TITLE	CONTENT
1post123	Exploring the Enchanting Charms of Kyoto	When it comes to captivating travel destinations, Ky

Fig-6: Testing – Querying posts from the table using SQL

Error Handling and Security:

Ensure you have proper error handling for database operations, as well as security practices like parameterized queries to prevent SQL injection.

Deploy the Site:

Once your Flask application is ready and configured to connect to the Db2 service on IBM Cloud, you can deploy it to your preferred hosting environment.

By integrating IBM Cloud's Db2 service with your Flask application, can able to build a secure and scalable web application with a reliable database backend. This combination provides a powerful and flexible solution for web application development and data management.

Tools and Technologies:

I have created the Personal Travel Blog Website by integrating Flask to specifically handle the Routes, Templates, Static files and to connect with the DB2 Database from the IBM Cloud then used Docker to containerize the application then Kubernetes was used to manage the container.

Flask for Web Application Development:

Flask is a lightweight Python web framework that simplifies web application development. It is ideal for building web applications with minimal boilerplate code.

- **Route Handling**: Define routes using Flask's route decorators (e.g., **@app.route('/path')**) to specify how different URLs should be handled by your application.
- **Templates**: Use Flask's template engine, such as Jinja2, to create dynamic HTML templates for rendering web pages.
- **Static Files**: Serve static files like CSS, JavaScript, and images using Flask's built-in functionality.
- **Database Integration**: Use Flask extensions like Flask-SQLAlchemy to connect your application to the IBM Cloud DB2 database. Define database models, create, read, update, and delete data records.

HTML (Hyper Text Markup Language):

- Defines the structure and content of web pages.
- Utilized for creating headers, navigation menus, content sections, and forms.

- Combines with Flask templates to generate dynamic content.

CSS (Cascading Style Sheets):

- Styles the website, determining layout, fonts, colors, and aesthetics.
- Ensures responsive design for different screen sizes and devices.
- Can incorporate CSS frameworks for consistent styling.

JavaScript:

- Adds interactivity to the website, including image sliders, maps, and dynamic content.
- Enables AJAX for seamless data retrieval and submission.
- Validates user input, provides real-time feedback, and enhances user experience.

IBM Cloud DB2 Database:

IBM Cloud DB2 is a fully managed database service provided by IBM Cloud. It offers robust database capabilities and can be integrated into your Flask application.

- **Database Setup**: Set up an instance of IBM Cloud DB2 and configure your database connection within your Flask application.
- **Schema Design**: Define the structure of your database, including tables for blog posts, user data, or any other data your blog requires.
- **Data Management**: Use SQL or an ORM (Object-Relational Mapping) library like SQLAlchemy to interact with the database, including storing and retrieving blog content.

Docker for Containerization:

Docker is a containerization platform that packages applications and their dependencies into isolated containers. This ensures consistent deployment and runtime environments.

- **Dockerfile**: Write a Dockerfile that specifies how your Flask application should be containerized. Include instructions for setting up the environment, copying code, and configuring the application.
- **Image Building**: Build a Docker image from your Dockerfile using the **docker build** command. This image encapsulates your application and its dependencies.

Kubernetes for Orchestration:

Kubernetes is an open-source container orchestration platform for automating deployment, scaling, and management of containerized applications.

- **Kubernetes Cluster**: Create or use an existing Kubernetes cluster in your IBM Cloud environment. Kubernetes manages the deployment, scaling, and operation of your Docker containers.
- **Deployment Configuration**: Define Kubernetes YAML files specifying the deployment, services, and other resources for your Flask application.
- **Load Balancing**: Create a Kubernetes service with a LoadBalancer type to expose your Flask application to the internet. This service can distribute incoming traffic among your containers.
- **Scaling**: Kubernetes allows for easy horizontal scaling by creating multiple instances of your containers based on traffic and resource requirements.

Leveraged Flask, IBM Cloud DB2, Docker, and Kubernetes to create, deploy, and manage the Personal Travel Blog Website with efficiency, scalability, and maintainability. This combination of tools ensures a reliable and high-performance web application for sharing the travel adventures and inspiring others to explore the world.

Program Section:

File Structure:

It contains "static," "templates," and "app.py" sections.

- static/
    - CSS and JavaScript files
- templates/
    - HTML templates
- app.py
    - Main Flask application file
- Dockerfile
    - Docker configuration
- requirements.txt
    - List of Python package dependencies
- DigiCertGlobalRootCA.crt
    - Certificate authority file for secure database connections

Templates Directory:

The "templates" directory is where it stores the HTML templates. Flask uses a template engine, typically Jinja2, to render these templates dynamically with data and variables, allowing it to create dynamic web pages with consistent structures and layouts.

It contains, four files namely base.html, index.html, create.html and post.html.

base.html

```
<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <link rel="preconnect" href="https://fonts.googleapis.com">

    <link rel="preconnect" href="https://fonts.gstatic.com" crossorigin>

    <link
href="https://fonts.googleapis.com/css2?family=Cinzel+Decorative:wght@700&family=Roboto:wgh
t@300;400;500;700&display=swap" rel="stylesheet">

    {% block head %}{% endblock %}

</head>

<body>

    {% block body %}{% endblock %}

</body>

</html>
```

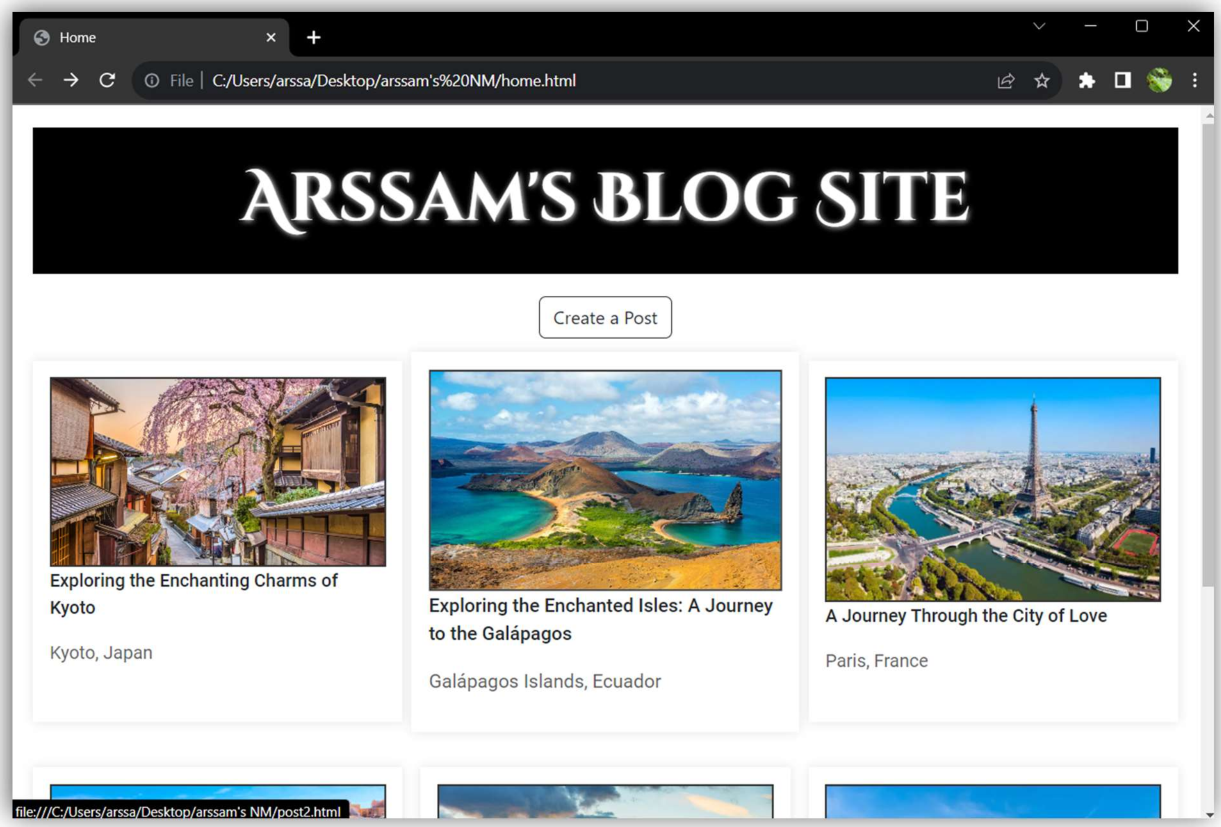

Home
File | C:/Users/arssa/Desktop/arssam's%20NM/home.html
ARSSAM'S BLOG SITE
Create a Post
Exploring the Enchanting Charms of Kyoto
Kyoto, Japan
Exploring the Enchanted Isles: A Journey to the Galápagos
Galápagos Islands, Ecuador
A Journey Through the City of Love
Paris, France
file:///C:/Users/arssa/Desktop/arssam's NM/post2.html

Fig-7: Home page of the Personal Travel Blog Website

index.html

```
{% extends 'base.html' %}

{% block head %}

    <title>Home</title>

    <link rel="stylesheet" href="{{ url_for('static', filename='home.css') }}" />

    <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/css/bootstrap.min.css"
rel="stylesheet" integrity="sha384-
T3c6CoIi6uLrA9TneNEoa7RxnatzjcDSCmG1MXxSR1GAsXEV/Dwwykc2MPK8M2HN" crossorigin="anonymous">

{% endblock %}

{% block body %}

    <header>Arssam's Blog Site</header>


    <div class="create-btn">

        <a href="/create" class="btn btn-outline-dark" type="button">Create a Post</a>

    </div>

    <div class="all-posts-container">

        {% for list in lists %}

        <div class="post-container">

            <a href="/post/{{ list.postid }}" class="post-preview">

                <div class="picture-space">

                    <img

                        class="picture"

                        src="{{ list.iurl }}"

                        alt="{{ list.postid }} image"

                        width="500px"

                    />

                </div>

                <div class="post-info">

                    <p class="post-title">{{ list.title }}</p>

                    <p class="post-location">{{ list.location }}</p>

                </div>

            </a>

        </div>

        {% endfor %}

    </div>


{% endblock %}
```

create.html

```
{% extends 'base.html' %}


{% block head %}
    <title>New Post</title>
    <link rel="stylesheet" href="{{ url_for('static', filename='create.css') }}" />
    <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/css/bootstrap.min.css" 
rel="stylesheet" integrity="sha384-
T3c6CoIi6uLrA9TneNEoa7RxnatzjcDSCmG1MXxSR1GAsXEV/Dwwykc2MPK8M2HN" crossorigin="anonymous">
{% endblock %}


{% block body %}


<header>Arssam's Blog Site</header>


<h1>Create a New Post</h1>


<form action="/create" method="post">
    <div class="form-floating mb-3 mt-3">
        <input name="title" class="form-control" placeholder="Title of the post" required>
        <label for="floatingInput">Title</label>
    </div>


    <div class="form-floating mb-3">
        <input name="postid" class="form-control" placeholder="example123" required>
        <label for="floatingPassword">Post ID</label>
    </div>


    <div class="form-floating mb-3">
        <textarea name="content" class="form-control" placeholder="Describe your 
journey..." style="height: 250px" required></textarea>
        <label for="floatingTextarea2">Post Content</label>
    </div>


    <div class="form-floating mb-3">
        <input name="location" class="form-control" placeholder="City, Country" required>
        <label for="floatingPassword">Location</label>
    </div>


    <div class="input-group mb-3">
        <span class="input-group-text">URL</span>
        <div class="form-floating">
            <input name="iurl" type="text" class="form-control"
placeholder="https://imagesource..." required>
            <label for="floatingInputGroup1">Image Link</label>
        </div>
    </div>


    <button type="submit" class="btn btn-outline-primary">Create</button>
</form>
{% endblock %}
```

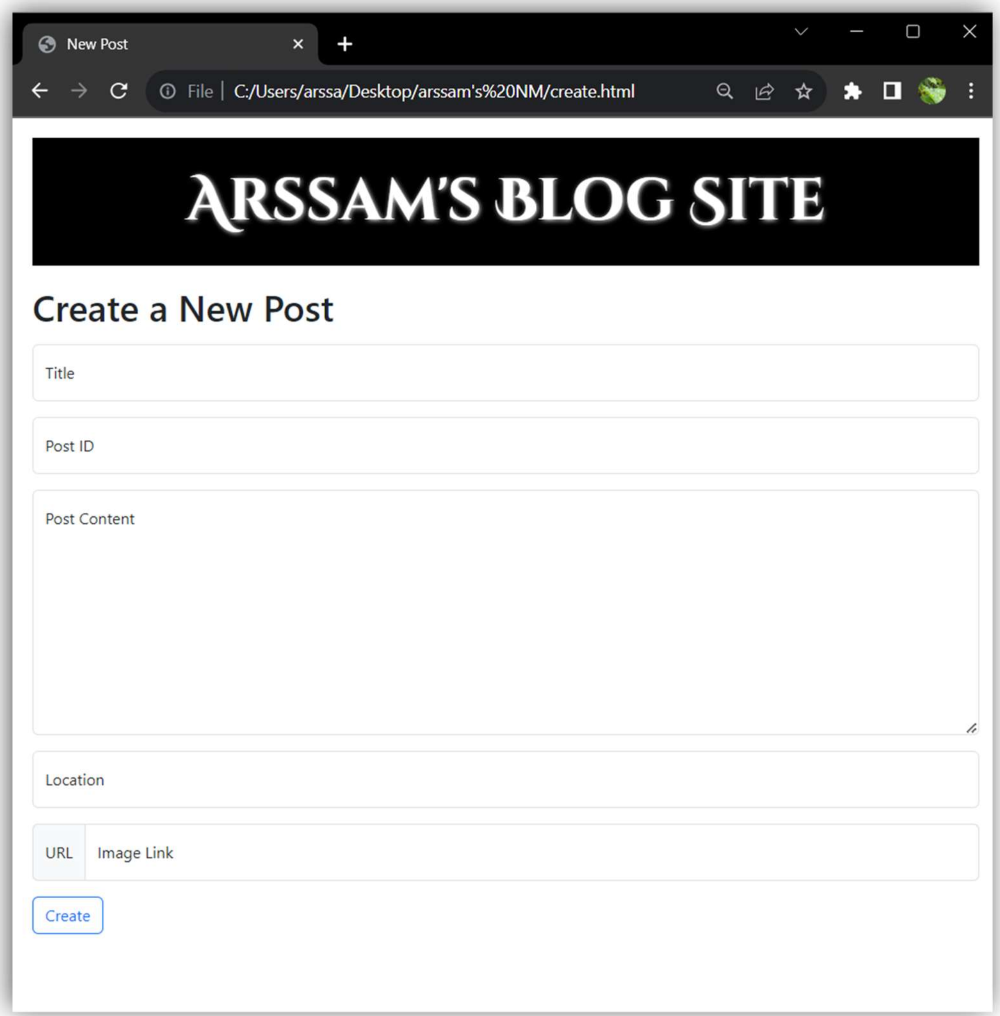
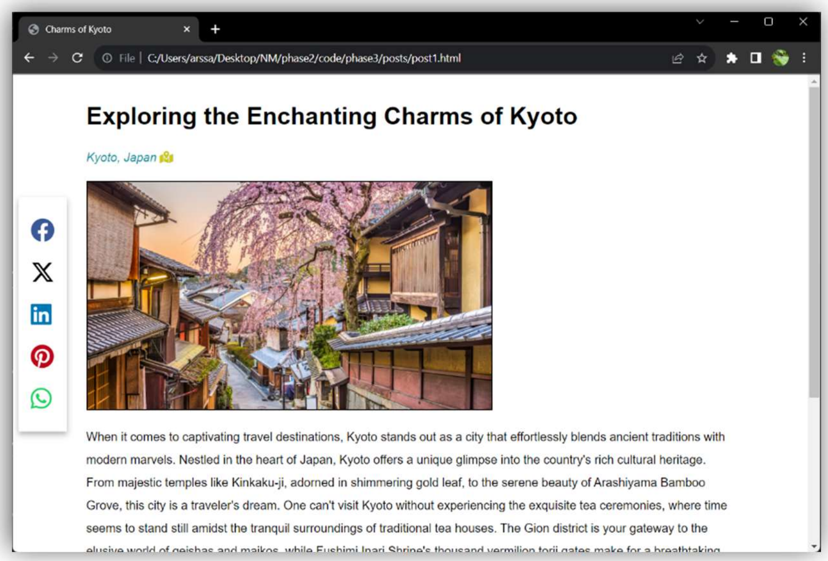


Fig-8: Creation page for the new post

post.html

```
{% extends 'base.html' %}


{% block head %}

    <title>{{ post.title }}</title>

    <link rel="stylesheet" href="{{ url_for('static', filename='style.css') }}" />

    <link rel="stylesheet" href="{{ url_for('static', filename='main.js') }}" />

    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/6.4.2/css/all.min.css"/>

    <link rel="stylesheet"
href="https://fonts.googleapis.com/css2?family=Material+Symbols+Outlined:opsz,wght,FILL,GRA
D@24,400,0,0" />

{% endblock %}


{% block body %}

    <div class="share-btn-container">

      <a href="#" class="facebook-btn">

        <i class="fab fa-facebook"></i>

      </a>

      <a href="#" class="twitter-btn">

        <i class="fab fa-x-twitter"></i>

      </a>

      <a href="#" class="linkedin-btn">

        <i class="fab fa-linkedin"></i>

      </a>


      <a href="#" class="pinterest-btn">

        <i class="fab fa-pinterest"></i>

      </a>


      <a href="#" class="whatsapp-btn">

        <i class="fab fa-whatsapp"></i>

      </a>


    </div>
    <div class="content">
      <h1 id="title">{{ post.title }}</h1>

      <p>
        <a href="#" class="maps-btn">
          <i id="location">{{ post.location }}</i>
          <i class="fa-solid fa-map-location-dot"></i>
        </a>

      </p>

      <div class="main-content-container">
        <img
        class="img"
        src="{{ post.iurl }}"
        alt="{{ post.postid }} Image"
        />

        <p>
          {{ post.content }}
        </p>

      </div>
    </div>

    <div class="comment-container">
      <h2>Comments</h2>
      <div class="container">
        <input id="commentInput" type="text" placeholder="Add a comment...">
        <span class="material-symbols-outlined send" onclick="addComment()">send</span>
      </div>
      <div id="comments"></div>
    </div>

    <script src="{{ url_for('static', filename='main.js') }}"></script>
{% endblock %}
```

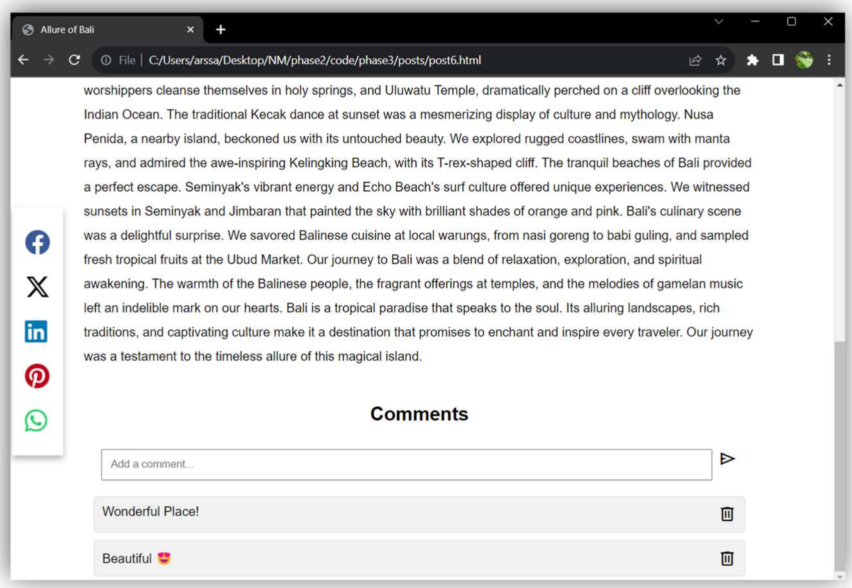

Charms of Kyoto
File | C:/Users/arssa/Desktop/NM/phase2/code/phase3/posts/post1.html

Exploring the Enchanting Charms of Kyoto

Kyoto, Japan

When it comes to captivating travel destinations, Kyoto stands out as a city that effortlessly blends ancient traditions with modern marvels. Nestled in the heart of Japan, Kyoto offers a unique glimpse into the country's rich cultural heritage. From majestic temples like Kinkaku-ji, adorned in shimmering gold leaf, to the serene beauty of Arashiyama Bamboo Grove, this city is a traveler's dream. One can't visit Kyoto without experiencing the exquisite tea ceremonies, where time seems to stand still amidst the tranquil surroundings of traditional tea houses. The Gion district is your gateway to the elusive world of geishas and maikos, while Fushimi Inari Shrine's thousand vermilion torii gates make for a breathtaking

Fig-9: Post page for the travel blog


Allure of Bali
File | C:/Users/arssa/Desktop/NM/phase2/code/phase3/posts/post6.html

worshippers cleanse themselves in holy springs, and Uluwatu Temple, dramatically perched on a cliff overlooking the Indian Ocean. The traditional Kecak dance at sunset was a mesmerizing display of culture and mythology. Nusa Penida, a nearby island, beckoned us with its untouched beauty. We explored rugged coastlines, swam with manta rays, and admired the awe-inspiring Kelingking Beach, with its T-rex-shaped cliff. The tranquil beaches of Bali provided a perfect escape. Seminyak's vibrant energy and Echo Beach's surf culture offered unique experiences. We witnessed sunsets in Seminyak and Jimbaran that painted the sky with brilliant shades of orange and pink. Bali's culinary scene was a delightful surprise. We savored Balinese cuisine at local warungs, from nasi goreng to babi guling, and sampled fresh tropical fruits at the Ubud Market. Our journey to Bali was a blend of relaxation, exploration, and spiritual awakening. The warmth of the Balinese people, the fragrant offerings at temples, and the melodies of gamelan music left an indelible mark on our hearts. Bali is a tropical paradise that speaks to the soul. Its alluring landscapes, rich traditions, and captivating culture make it a destination that promises to enchant and inspire every traveler. Our journey was a testament to the timeless allure of this magical island.

Comments

Add a comment...

Wonderful Place!

Beautiful 😍

Fig-10: Post page contains share buttons and comment Section

Static Directory:

The "static" directory is where it stores static assets such as CSS (Cascading Style Sheets), JavaScript, images, and other files that don't change dynamically. This directory is used to serve static files to the client's web browser, enhancing the styling and interactivity of your web pages.

It contains, three files namely home.css, style.css, create.css and main.js.

home.css

```
.post-info {
    font-family: Roboto, Arial;
    font-size: 16px;
}
.post-title {
    font-weight: 500;
}
.post-location {
    color: rgb(92, 92, 92);
}

.post-container {
    padding: 15px;
    background-color: rgb(255, 255, 255);
    box-shadow: 0 0 10px rgba(0, 0, 0, 0.1);
    transition: transform .2s;
}

.post-container:hover {
    transform: scale(1.05);
}

.all-posts-container {
    display: grid;
    grid-template-columns: 1fr 1fr 1fr;
    column-gap: 16px;
    row-gap: 40px;
}

a {
    text-decoration: inherit;
    color: inherit;
}
```

```
.picture {
    border: 2px solid rgb(52, 52, 52);
    width: 100%;
}

@media (max-width: 450px) {
    .all-posts-container {
        grid-template-columns: 1fr;
    }
}

@media (min-width: 451px) and (max-width: 750px) {
    .all-posts-container {
        grid-template-columns: 1fr 1fr;
    }
}

@media (min-width: 751px) and (max-width: 1249px) {
    .all-posts-container {
        grid-template-columns: 1fr 1fr 1fr;
    }
}

@media (min-width: 1250px) {
    .all-posts-container {
        grid-template-columns: 1fr 1fr 1fr 1fr;
    }
}

header {
    text-align: center;
    font-family: 'Cinzel Decorative', Arial, Helvetica, sans-serif;
    font-size: 60px;
    font-weight: 700;
    background-color: rgb(0, 0, 0);
    color: rgb(255, 255, 255);
    padding: 20px;

    margin-bottom: 20px;

    text-shadow: 1px 1px 5px rgb(255, 255, 255);


}


.create-btn {

    display: flex;

    justify-content: center;

    margin-bottom: 20px;

}


body {

    background-color: rgb(245, 245, 245);

    padding: 20px;

}
```

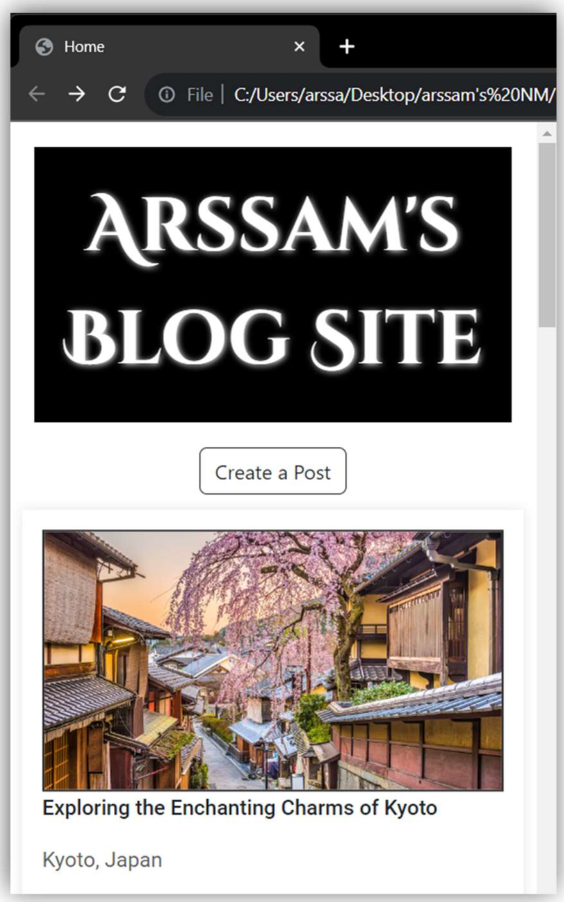

Home
File | C:/Users/arssa/Desktop/arssam's%20NM/
ARSSAM'S BLOG SITE
Create a Post
Exploring the Enchanting Charms of Kyoto
Kyoto, Japan

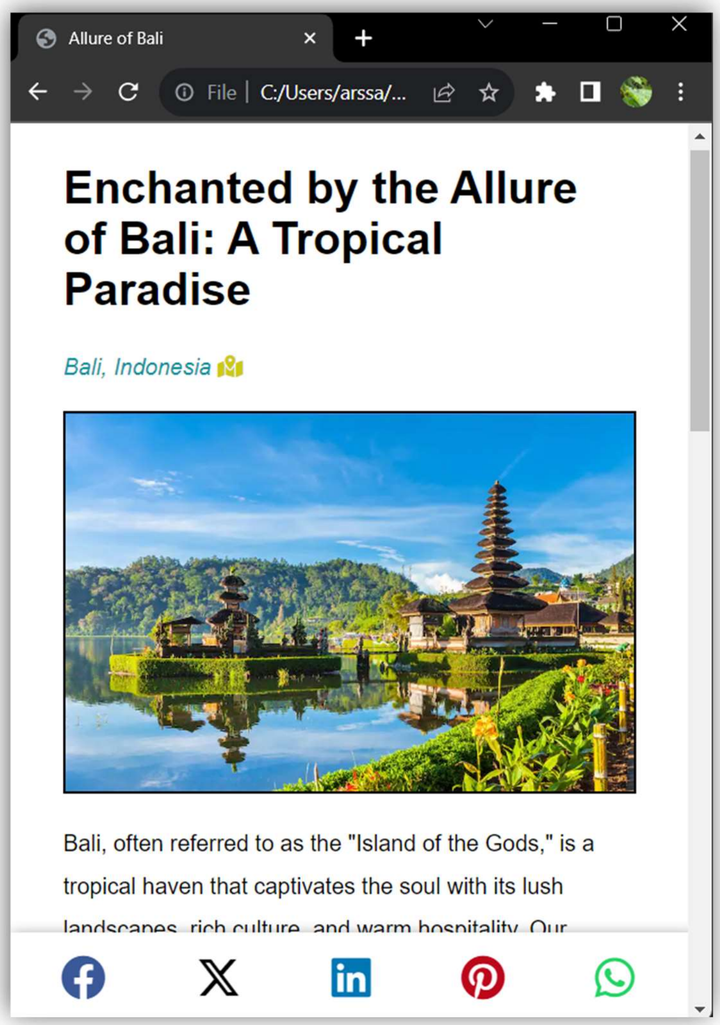
Fig-11: Responsive design for the home page

style.css

```
/* Content */

.content {
  padding: 8px 90px;
  font-family: "Roboto", sans-serif;
}

.content p {
  line-height: 1.9;
}

.content img {
  max-height: 500px;
}

/* Share Buttons */

.share-btn-container {
  background: #fff;
  display: flex;
  flex-direction: column;
  padding: 16px;
  box-shadow: 0 4px 8px rgba(0, 0, 0, 0.3);
  position: fixed;
  top: 50%;
  transform: translateY(-50%);
}

.share-btn-container a i {
  font-size: 32px;
}

.share-btn-container a {
  margin: 12px 0;
  transition: 500ms;
}

.share-btn-container a:hover, .maps-btn :hover{
  transform: scale(1.2);
}

.share-btn-container .fa-facebook {
  color: #3b5998;
}

.share-btn-container .fa-x-twitter {
  color: #000000
}

.share-btn-container .fa-linkedin {
  color: #0077b5;
}

.share-btn-container .fa-pinterest {
  color: #bd081c;
}

.share-btn-container .fa-whatsapp {
  color: #25d366;
}

.maps-btn .fa-map-location-dot {
  color: #cdca15;
  transition: 500ms;
}

.maps-btn {
  text-decoration: none;
  color: #1c95a2;
}
```

```
.img {

  width: 50vw;
  max-width: 100%;
  border: 2px solid rgba(0, 0, 0);
}

/* Media Queries */

@media (max-width: 550px) {
  .content {
    padding: 8px 32px;
  }

  .share-btn-container {
    transform: unset;
    top: unset;
    left: 0;
    bottom: 0;
    width: 100%;
    flex-direction: row;
    box-shadow: 4px 0 8px rgba(0, 0, 0, 0.3);
    padding: 16px 0;
    justify-content: center;
  }

  .share-btn-container a {
    margin: 0 32px;
  }

  .img {
    width: 100vw;
    max-width: 100%;
    border: 2px solid rgba(0, 0, 0);
  }
}
```

```
/* Comment Section */

.container{
  display: flex;
      justify-content: space-between;
      padding: 10px;
      margin: 10px 0;
}
.comment-container {
    width: 80%;
    margin: 0 auto;
    font-family: Arial, sans-serif;
}
.comment-container h2 {
    text-align: center;
}
#commentInput{
    flex: 0.99;
    padding:10px;
}
.comment {
    display: flex;
    justify-content: space-between;
    background-color: #f2f2f2;
    padding: 10px;
    margin: 10px 0;
    border: 1px solid #ddd;
    border-radius: 5px;
}
.comment-actions {
    display: flex;
}
.delete-button {
    background-color: #ff5757;
    color: white;
    border: none;
    padding: 5px 10px;
    margin-left: 5px;
    cursor: pointer;
}
.material-symbols-outlined: hover{
    cursor: pointer;
}
.send{
    font-size:30px;
}
```



Enchanted by the Allure of Bali: A Tropical Paradise

Bali, Indonesia

Bali, often referred to as the "Island of the Gods," is a tropical haven that captivates the soul with its lush landscapes, rich culture, and warm hospitality. Our

Fig-12: Responsive design for the post page

create.css

```
body {
    padding: 20px;
}


header {
    text-align: center;
    font-family: 'Cinzel Decorative', Arial, Helvetica, sans-serif;
    font-size: 60px;
    font-weight: 700;
    background-color: rgb(0, 0, 0);
    color: rgb(255, 255, 255);
    padding: 20px;
    margin-bottom: 20px;
    text-shadow: 1px 1px 5px rgb(255, 255, 255);


}
```

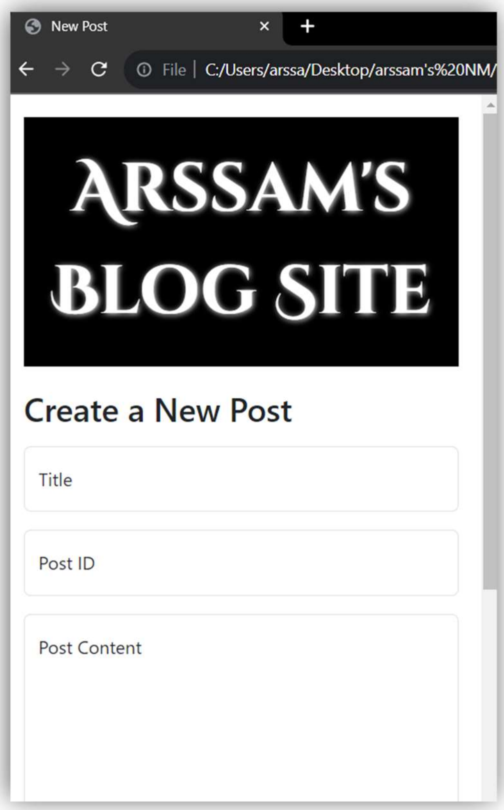


Fig-13: Responsive design for the post creation page

main.js

```
// Share and Maps section
const facebookBtn = document.querySelector(".facebook-btn");
const twitterBtn = document.querySelector(".twitter-btn");
const pinterestBtn = document.querySelector(".pinterest-btn");
const linkedinBtn = document.querySelector(".linkedin-btn");
const whatsappBtn = document.querySelector(".whatsapp-btn");
const mapsBtn = document.querySelector(".maps-btn");

function init() {
  const img = document.querySelector(".img");

  let postUrl = encodeURI(document.location.href);
  let postTitle = encodeURI(document.getElementById("title").textContent);
  let postImg = encodeURI(img.src);
  let location = encodeURI(document.getElementById("location").textContent);

  facebookBtn.setAttribute(
    "href",
    `https://www.facebook.com/sharer.php?u=${postUrl}`
  );

  twitterBtn.setAttribute(
    "href",
    `https://twitter.com/share?url=${postUrl}&text=${postTitle}`
  );

  pinterestBtn.setAttribute(
    "href",
`https://pinterest.com/pin/create/bookmarklet/?media=${postImg}&url=${postUrl}&description=
${postTitle}`
  );

  linkedinBtn.setAttribute(
    "href",
    `https://www.linkedin.com/shareArticle?url=${postUrl}&title=${postTitle}`
  );

  whatsappBtn.setAttribute(
    "href",
    `https://wa.me/?text=${postTitle} ${postUrl}`
  );

  mapsBtn.setAttribute(
    "href",
    `https://www.google.com/maps?q=${location}&ie=UTF8`
  );
}

init();

//Comment Section
commentInput.addEventListener("keyup",   (event)   =>   {if   (event.key    ==    "Enter")
{addComment();}});

function addComment() {
  const commentInput = document.getElementById("commentInput");
  const commentText = commentInput.value.trim();

  if (commentText !== "") {
      const commentsContainer = document.getElementById("comments");
      const commentDiv = document.createElement("div");
      commentDiv.classList.add("comment");
      commentDiv.innerHTML = `
          <div>${commentText}</div>
          <div class="comment-actions">
              <span                                       class="material-symbols-outlined"
onclick="deleteComment(this)">delete</span>
          </div>
      `;
      commentsContainer.appendChild(commentDiv);
      commentInput.value = "";
      window.scrollTo(0, document.body.scrollHeight);
  }
}
function deleteComment(button) {
  const commentDiv = button.closest(".comment");
  commentDiv.remove();
}
```

Manual Installation:

By using the Python package manager, pip, to install Flask. If you do not have Python installed, you should install Python first. Here are the steps:

Create a Virtual Environment (Optional):

It is a good practice to create a virtual environment to manage your project's dependencies. This step is optional but recommended.

# Create a virtual environment

```
python -m venv myenv
```

Activate the virtual environment

```
source myenv/bin/activate
```

# On Windows,

```
myenv\Scripts\activate
```

Install Flask:

After activating your virtual environment, you can install Flask using pip:

```
pip install Flask
```

Install ibm_db for IBM Db2:

To use ibm_db with Flask for IBM Db2 integration, you need to install this package. You will also need the IBM Db2 client, which should be installed on your system. Follow these steps:

Install IBM Db2 Client:

You should have the IBM Db2 client installed on your system. You can download the client from the IBM website and follow the installation instructions for your operating system.

Install ibm_db:

Once you have the IBM Db2 client installed, you can install ibm_db using pip:

```
pip install ibm_db
```

Run the Application:

Using docker build, enlist Docker's help in building the image. Can able to combine the build command with other tags, such as the "--tag" flag, to specify the image name.

```
docker build --tag python-docker
```

Using the docker run command, we can run an image by passing the image's name as a parameter.

Regardless of whether the container is running, it is doing so in isolation mode and cannot connect to localhost:5000.

The best solution is to run the image in detached mode. Because we need to view this application in the browser rather than the container, modify the docker run and add two additional tags: "-d" to run it in detached mode and "-p" to specify the port to be exposed.

The docker run command will now be formatted as follows:

```
docker run -d -p 5000:5000 python-docker
```

Use the following command to see which containers are currently running:

```
docker ps
```

To stop the currently running container, we execute this command:

```
docker stop <container-name>
```

app.py

```
from flask import Flask, render_template, url_for, redirect, request

import ibm_db


global conn


conn = ibm_db.connect("DATABASE=bludb;HOSTNAME=764264db-9824-4b7c-82df-
40d1b13897c2.bs2io90l08kqb1od8lcg.databases.appdomain.cloud;PORT=32536;SECURITY=SSL;SSLServ
erCertificate=DigiCertGlobalRootCA.crt;UID=cgs30384;PWD=pMs2fEZ5sMZzIk6g;",'','')


app = Flask(__name__)


@app.route('/')

def index():


    lists = []


    sql = "SELECT * FROM CGS30384.BLOGDB"

    stmt = ibm_db.prepare(conn, sql)

    ibm_db.execute(stmt)


    while True:

        row = ibm_db.fetch_assoc(stmt)

        if row is None:

            break

        lists.append(row)


    return render_template('index.html', lists=lists)



@app.route('/create', methods=['POST', 'GET'])

def create():


    if request.method == 'POST':


        postid = request.form['postid']

        title = request.form['title']
        content = request.form['content']

        location = request.form['location']

        iurl = request.form['iurl']


        sql = "INSERT INTO CGS30384.BLOGDB(postid, title, content, location, iurl)
VALUES(?, ?, ?, ?, ?)"


        stmt = ibm_db.prepare(conn, sql)


        ibm_db.bind_param(stmt, 1, postid)

        ibm_db.bind_param(stmt, 2, title)

        ibm_db.bind_param(stmt, 3, content)

        ibm_db.bind_param(stmt, 4, location)

        ibm_db.bind_param(stmt, 5, iurl)


        if ibm_db.execute(stmt):

            print("New Post was inserted into the database successfully")

        else:

            print("Failed to insert the new post!")


    else:

        return render_template('create.html')


@app.route('/post/<string:postid>')

def post_view(postid):


    sql = "SELECT * FROM CGS30384.BLOGDB WHERE POSTID = ?"

    stmt = ibm_db.prepare(conn, sql)

    ibm_db.bind_param(stmt, 1, postid)

    ibm_db.execute(stmt)

    post = ibm_db.fetch_assoc(stmt)

    if post:

        return render_template('post.html', post=post)

    else:

        return redirect('/')
```

```
if __name__ == "__main__":
    app.run(debug=False)
```

Dockerfile is used to define the environment and instructions for creating a Docker image. A Docker image is a standalone executable package that contains everything needed to run a piece of software, including the code, runtime, libraries, and system tools.

A requirements.txt file is a text file used in Python projects to specify and document the project's dependencies. This file is crucial for managing the Python packages that your project relies on.

Dockerfile

```
#syntax=docker/dockerfile:1

FROM python:alphine3.7

COPY . /app

WORKDIR /app

RUN pip install -r requirements.txt

EXPOSE 5000

ENTRYPOINT [ "python" ]

CMD [ "app.py" ]
```

requirements.txt

```
ibm-db==3.2.0

ibm-db-sa==0.4.0

Flask==3.0.0

Flask-SQLAlchemy==3.1.1

Click==8.1.7

Jinja2==3.1.2

SQLAlchemy==2.0.22

Werkzeug==3.0.1
```

IBM Cloud Kubernetes:

IBM manages the master, freeing the user from having to administer the host OS, container runtime and Kubernetes version-update process

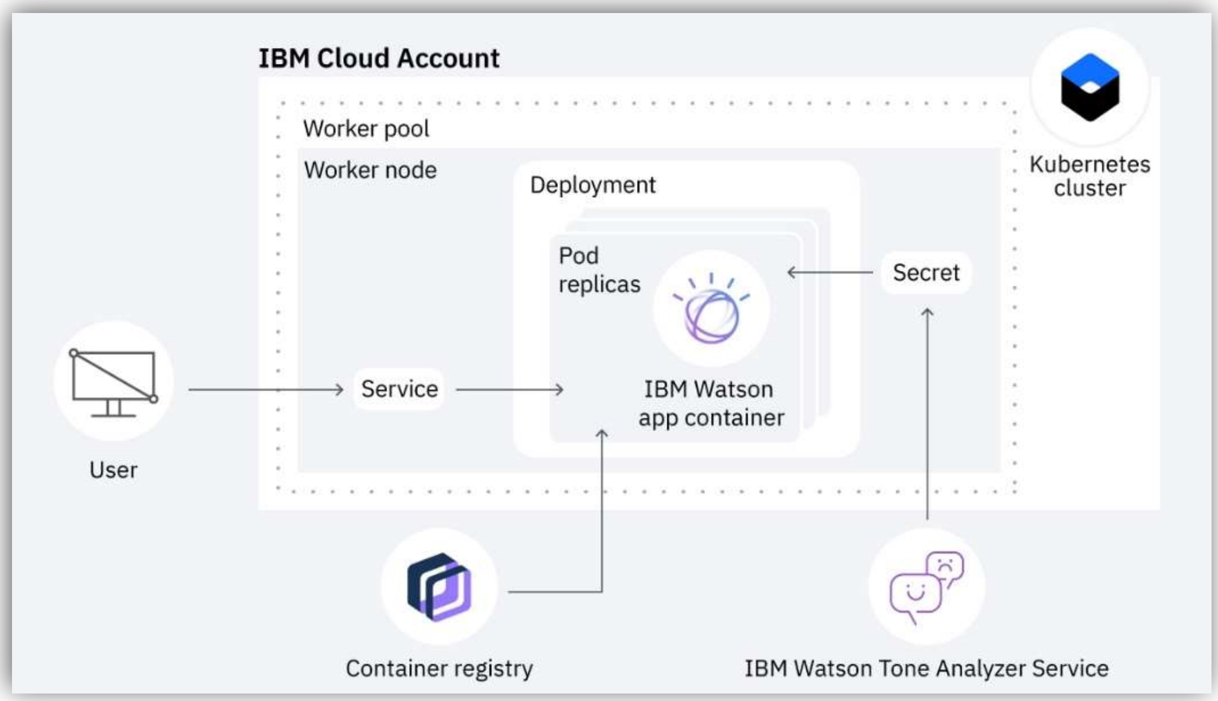


Fig-14: Creation of the Kubernetes Clusters in the IBM Cloud

Push the Docker Image to a Container Registry:

Use a container registry like IBM Container Registry or Docker Hub to store your Docker image.

Tag the image for the registry:

```
docker tag flask-app registry-url/namespace/blog -app
```

Push the image to the registry:

```
docker push registry-url/namespace/blog -app
```

Log In to IBM Cloud:

Use the IBM Cloud CLI to log in to your IBM Cloud account:

```
ibmcloud login
```

Create a Kubernetes Cluster:

Kubernetes cluster can be created by using the IBM Cloud Console or the CLI.

Via IBM Cloud CLI:

```
ibmcloud ks cluster create --name my-cluster-name
```

Set Kubernetes Configuration:

Set the Kubernetes context for your cluster to enable kubectl to interact with it:

```
ibmcloud ks cluster config --cluster my-cluster-name
```

Create Kubernetes Deployment YAML:

Create a deployment.yaml file to define the travel blog application's deployment:

<u>deployment.yaml</u>

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: flask-deployment
spec:
  replicas: 3
  selector:
    matchLabels:
      app: flask
  template:
    metadata:
      labels:
        app: flask
    spec:
      containers:
      - name: flask-container
        image: registry-url/namespace/blog-app
        ports:
        - containerPort: 80
```

Create Kubernetes Service YAML:

Create a service.yaml file to expose the blog application to the internet:

service.yaml

```
apiVersion: v1

kind: Service

metadata:

  name: flask-service

spec:

  selector:

    app: flask

  ports:

    - protocol: TCP

      port: 80

      targetPort: 80

  type: LoadBalancer
```

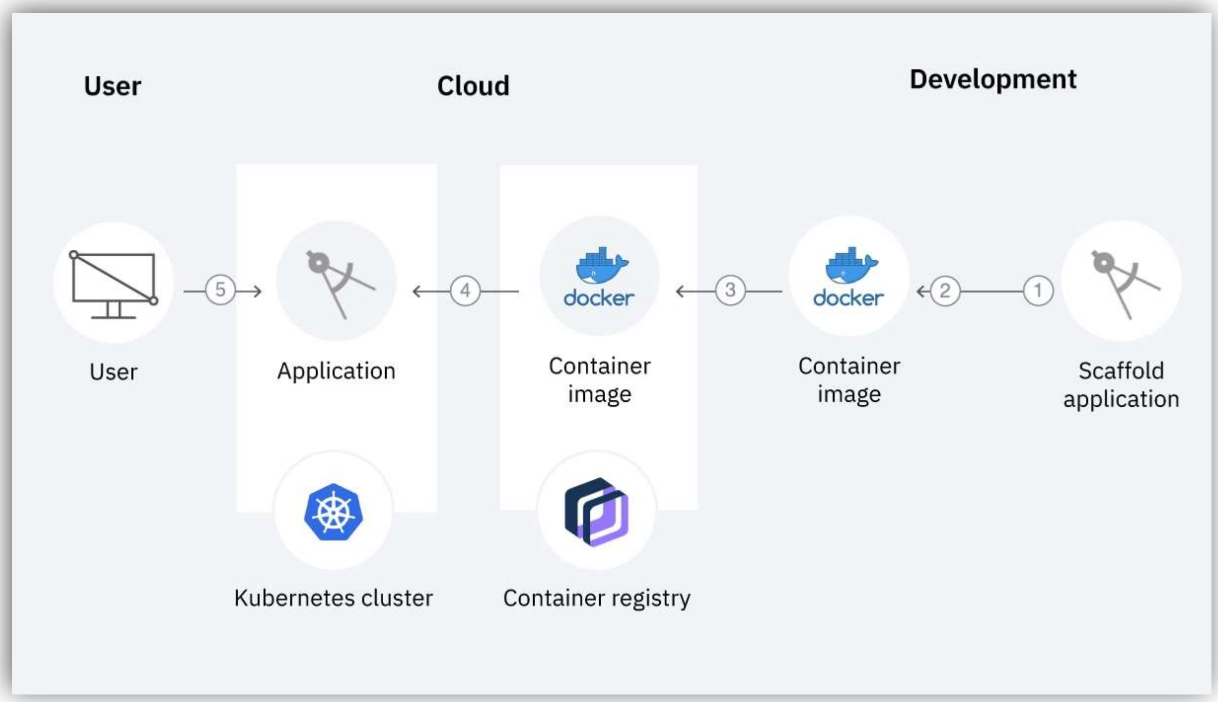


Fig-15: Deployment of the application in the Kubernetes Clusters

Deploy to Kubernetes:

Deploy the blog application:

```
kubectl apply -f deployment.yaml
```

Expose the blog application:

```
kubectl apply -f service.yaml
```

Access the Blog Application:

Once deployed, Flask application can able to access through the Load Balancer's external IP address or domain. To find the external IP address, use the following command:

```
kubectl get svc flask-service
```

This IP address is where the application is accessible.

The travel blog application is now successfully integrated into IBM Cloud Kubernetes, making it available to users on the internet. can able to scale and manage the application within the Kubernetes cluster as needed.

Benefits:

Integrating a Flask application into IBM Cloud Kubernetes provides a robust, scalable, and cost-effective solution for the web application. It simplifies deployment, ensures high availability, and offers security and isolation while providing a flexible and dynamic environment to meet the needs of the project as it evolves.

Scalability:

Kubernetes allows to easily scale your Flask application up or down based on traffic and resource demands. This ensures that your website remains responsive during traffic spikes without incurring excessive costs during quieter periods.

High Availability:

Kubernetes provides automated load balancing and failover capabilities. This means that if one instance of the application fails, traffic is automatically redirected to healthy instances, ensuring minimal downtime and a consistent user experience.

Resource Efficiency:

Kubernetes optimizes resource utilization by efficiently packing containers onto nodes. It ensures that your Flask application uses resources effectively, reducing costs and improving performance.

Self-Healing:

Kubernetes automatically replaces failed containers, making the Flask application more resilient. If a container crashes or becomes unresponsive, Kubernetes will spin up a replacement to maintain service availability.

Uniform Environment:

Docker containers ensure that the Flask application runs consistently across different environments, making it easier to develop, test, and deploy your application with minimal environment-related issues.

Simplified Deployment:

Kubernetes streamlines deployment and scaling, reducing the time and effort needed to manage the application. This makes it easier to focus on development and content creation rather than infrastructure management.

Security and Isolation:

Containers in Kubernetes are isolated from one another, enhancing security. The Flask application's dependencies are encapsulated, reducing the risk of conflicts or vulnerabilities.

Load Balancing:

Kubernetes provides load balancing for the Flask application, distributing incoming traffic across multiple instances. This ensures even distribution of workloads and better performance.

Consistency: By using Docker and Kubernetes, it maintains consistency in the deployment process. What works in the development environment is more likely to work in production, reducing the chances of unexpected issues.

Flexibility:

It can incorporate additional services, microservices, or databases as the project grows. It provides the flexibility to add and manage new components easily.

Cost Optimization:

Kubernetes helps in optimizing infrastructure costs by scaling resources as needed. pay for what is consumes, which can be more cost-effective than traditional hosting models.

Community and Ecosystem:

Kubernetes has a vast and active community, which means plenty of resources, documentation, and tools to aid in the project is available. This ecosystem fosters innovation and problem-solving.

Conclusion:

The creation of the personal travel blog hosted on IBM Cloud as a web app represents a compelling showcase of the capabilities of IBM Cloud. This project has been a journey of integration and innovation, combining various technologies and cloud services to bring this blog to life.

The use of Flask to manage routes, templates, and connect with the DB2 Database demonstrates the flexibility and power of web application frameworks. Containerizing the application with Docker and utilizing Kubernetes for container management reflects a commitment to scalability and robust infrastructure.

The outcome of this project is a dynamic, user-friendly travel blog that showcases a passion for travel and adventure. By converting HTML content into easily updatable template files, the website becomes a platform for sharing experiences and inspiring others to explore the world.

Ultimately, this travel blog is not only a personal venture but also a testament to the capabilities of IBM Cloud, serving as an example of how cloud services can empower individuals to create and share their unique content with the world. It is a testament to the power of technology to enable and amplify our passions, in this case, the love for travel and adventure.