KONGU ENGINEERING COLLEGE

(Autonomous)

PERUNDURAI ERODE – 638 060

Encoder Decoder Generator

A Project Report

submitted by

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PYTHON PROGRAMMING AND FRAMEWORKS (22ITT32)

DEPARTMENT OF INFORMATION TECHNOLOGY

CODING :

encoder.py

```
def lzw_encode(message):
    dictionary = {chr(i): i for i in range(256)}
    dict_size = 256
    encoded_message = [ ]
    current_sequence = ""

    for char in message:
        combined_sequence = current_sequence + char
        if combined_sequence in dictionary:
            current_sequence = combined_sequence
        else:
            encoded_message.append(dictionary[current_sequence])
            dictionary[combined_sequence] = dict_size
            dict_size += 1
            current_sequence = char

    if current_sequence:
        encoded_message.append(dictionary[current_sequence])

    return encoded_message

message = input("Enter the message to encode using LZW: ")
encoded_message = lzw_encode(message)
print("\nEncoded message:", encoded_message)
```

decoder.py

```
def lzw_decode(encoded_message):
    dictionary = {i: chr(i) for i in range(256)}
    dict_size = 256
    current_sequence = dictionary[encoded_message[0]]
    decoded_message = current_sequence

    for code in encoded_message[1:]:
        if code in dictionary:
            entry = dictionary[code]
        elif code == dict_size:
            entry = current_sequence + current_sequence[0]
        else:
            raise ValueError("Invalid LZW encoded message")

        decoded_message += entry
        dictionary[dict_size] = current_sequence + entry[0]
        dict_size += 1
        current_sequence = entry

    return decoded_message

encoded_message = input("Enter the encoded message (space-separated integers): ")
encoded_message = list(map(int, encoded_message.split()))
decoded_message = lzw_decode(encoded_message)
print(f"\nDecoded message: {decoded_message}")
```

home.py

```
{% block content %}
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width,
initial-scale=1.0">
  <title>Lempel-Ziv Encoding and Decoding</title>
  <style>
    body {
      font-family: 'Arial', sans-serif;
      background-color: #f0f4ff;
      margin: 0;
      padding: 0;
      color: #333;
    }
    header {
      background-color: #0047ab;
      padding: 20px;
      text-align: center;
      color: white;
      font-size: 2em;
    }
    nav {
      display: flex;
      justify-content: center;
      background-color: #87cefa;
      padding: 10px 0;
    }
    nav button {
      background-color: #4682b4;
      border: none;
      color: white;
      padding: 10px 20px;
      margin: 0 10px;
      cursor: pointer;
      font-size: 1em;
      border-radius: 5px;
      transition: background-color 0.3s ease;
    }
    nav button:hover {
      background-color: #0056b3;
    }
    section {
      max-width: 1200px;
      margin: 0 auto;
      padding: 20px;
    }
    .intro {
      background-color: #e0f7fa;
      padding: 20px;
      border-radius: 10px;
```

```
                    margin-bottom: 30px;
                    text-align: justify;
                }
                .card {
                    background-color: white;
                    padding: 20px;
                    border-radius: 10px;
                    box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);
                    margin-bottom: 30px;
                }
                h2 {
                    color: #0047ab;
                }
                input[type=text], textarea {
                    width: 100%;
                    padding: 15px;
                    margin: 10px 0;
                    border: 1px solid #ccc;
                    border-radius: 4px;
                }
                button {
                    background-color: #0047ab;
                    color: white;
                    padding: 15px 20px;
                    border: none;
                    border-radius: 5px;
                    cursor: pointer;
                    font-size: 1.1em;
                }
                button:hover {
                    background-color: #0056b3;
                }
                .output-box {
                    background-color: #e8f5e9;
                    padding: 20px;
                    border-radius: 10px;
                    margin-top: 10px;
                }
            </style>
            <link rel="stylesheet"
href="https://pyscript.net/latest/pyscript.css">
            <script defer
src="https://pyscript.net/latest/pyscript.js"></script>
        </head>
        <body>
            <header>
                Lempel-Ziv Encoding and Decoding
            </header>
            <nav>
                <button
onclick="window.location.href='#';">Home</button>
                <button onclick="window.location.href='{% url
'base:aboutus' %}'">About Us</button>
                <button onclick="window.location.href='{% url
'base:contactus' %}'">Contact Us</button>
                <button onclick="window.location.href='{% url
'base:f' %}'">Features</button>
```

```
        </nav>

        <section>
            <div class="intro">
                <h2>What is Lempel-Ziv Encoding?</h2>
                <p>Lempel-Ziv encoding is a widely used lossless
data compression algorithm. It works by replacing repeated
occurrences of data with references to a single copy, making it
efficient for various data types.</p>
            </div>


            <div class="card">
                <h2>Lempel-Ziv Encoding</h2>
                <p>Enter a sentence or string to generate its
Lempel-Ziv encoded form:</p>
                <textarea id="sentenceInput" rows="4"
placeholder="Enter a sentence..."></textarea>
                <button py-
click="encode_lzw()">Encode</button>

                <div class="output-box" id="encodedOutput">
                    <h3>Encoded Output:</h3>
                    <p id="encodedText"> </p>
                </div>
            </div>

            <div class="card">
                <h2>Lempel-Ziv Decoding</h2>
                <p>Enter the encoded sequence to decode it back
to the original sentence:</p>
                <input type="text" id="encodedInput"
placeholder="Enter encoded sequence...">
                <button py-
click="decode_lzw()">Decode</button>

                <div class="output-box" id="decodedOutput">
                    <h3>Decoded Sentence:</h3>
                    <p id="decodedText"></p>
                </div>
            </div>
        </section>

        <py-script>
            # Encoding function
            def encode_lzw(*args):
                input_text =
Element("sentenceInput").element.value
                if not input_text:
                    encoded_text = "Please enter a sentence."
                else:
                    dictionary = {chr(i): i for i in range(256)}
                    word = ""
                    result = []
                    for char in input_text:
                        wc = word + char
                        if wc in dictionary:
```

```
                        word = wc
                    else:
                        result.append(dictionary[word])
                        dictionary[wc] = len(dictionary)
                        word = char
                if word:
                    result.append(dictionary[word])
                encoded_text = " ".join(map(str, result))
            Element("encodedText").write(encoded_text)


        def decode_lzw(*args):
            encoded_text =
Element("encodedInput").element.value
            try:
                if not encoded_text:
                    raise ValueError("Please enter an encoded
sequence.")


                encoded_numbers = list(map(int,
encoded_text.split()))

                # Initialize dictionary
                dictionary = {i: chr(i) for i in range(256)}
                word = chr(encoded_numbers.pop(0))
                result = [word]

                # Decode
                for code in encoded_numbers:
                    if code in dictionary:
                        entry = dictionary[code]
                    elif code == len(dictionary):
                        entry = word + word[0]
                    else:
                        raise ValueError("Invalid encoded
sequence.")

                    result.append(entry)
                    dictionary[len(dictionary)] = word + entry[0]
                    word = entry

                decoded_text = "".join(result)

            except ValueError as ve:
                decoded_text = "Enter the sequence of numbers
that you have decoded !"
            except Exception as e:
                decoded_text = "An error occurred during
decoding."
            Element("decodedText").write(decoded_text)
        </py-script>
    </body>
    </html>
    {% endblock content %}
```

Login.py

```
{% extends "base.html" %}
{% block content %}
<div class="shadow-wrap">
 <div class="form-wrap">
  <h3>Login </h3>
<form method="POST">
 {% csrf_token %}
 {{form}}
 <button type="submit">Submit</button>
</form>
<a class="signup-link" href="{% url "base:authView" %}">Signup</a>
</div>
</div>
{% endblock content %}a
```

Signup.py

```
{% extends "base.html" %}
{% block content %}
<div class="shadow-wrap">
 <div class="form-wrap">
  <h3>Signup </h3>
<form method="POST">
 {% csrf_token %}
 {{form}}
 <button type="submit">Submit</button>
</form>
<a class="signup-link" href="{% url "base:login" %}">Login</a>
</div>
</div>
{% endblock content %}a
```

Features.py

```
{% block content %}
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Lempel-Ziv Encoding Features</title>
    <style>
        body {
            font-family: 'Arial', sans-serif;
            background-color: #f0f4ff;
            margin: 0;
            padding: 0;
            color: #333;
        }
        header {
            background-color: #0047ab; a
            padding: 20px;
            text-align: center;
            color: white;
```

```
    font-size: 2em;



}
nav {
    display: flex;
    justify-content: center;
    background-color: #87cefa;
    padding: 10px 0;
}
nav button {
    background-color: #4682b4;
    border: none;
    color: white;
    padding: 10px 20px;
    margin: 0 10px;
    cursor: pointer;
    font-size: 1em;
    border-radius: 5px;
    transition: background-color 0.3s ease;
}
nav button:hover {
    background-color: #0056b3;
}
section {
    max-width: 1200px;
    margin: 0 auto;
    padding: 20px;
}
.intro {
    background-color: #e0f7fa;
    padding: 20px;
    border-radius: 10px;
    margin-bottom: 30px;
    text-align: justify;
}
.feature-card {
    background-color: white;
    padding: 20px;
    border-radius: 10px;
    box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);
    margin-bottom: 30px;
    opacity: 0;
    transform: scale(0.95);
    transition: transform 0.3s ease, opacity 0.3s ease;
}
.feature-card:hover {
    transform: scale(1.05);
}
h2 {
    color: #0047ab;
}
p {
    line-height: 1.6;
    margin-bottom: 15px;
}
@keyframes fadeIn {
    from {
        opacity: 0;
        transform: translateY(20px);
    }
    to {
        opacity: 1;
        transform: translateY(0);
```

```
        }
      }
    </style>
</head>
<body>
    <header>
        Lempel-Ziv Encoding Features
    </header>

    <nav>
        <button onclick="window.location.href='{% url 'base:home' %}';">Home</button>
        <button onclick="window.location.href='{% url 'base:aboutus' %}';">About Us</button>
        <button onclick="window.location.href='{% url 'base:contactus' %}';">Contact Us</button>
        <button onclick="window.location.href='{% url 'base:f' %}'">Features</button>
    </nav>

    <section>
        <div class="intro">
            <h2>Introduction to Lempel-Ziv Encoding</h2>
            <p>Lempel-Ziv encoding is a lossless data compression technique used widely in file compression formats. This algorithm is renowned for its simplicity, efficiency, and ability to handle various types of data. Below are the standout features that make Lempel-Ziv encoding a preferred choice in many applications.</p>
        </div>

        <div class="feature-card" style="animation: fadeIn 0.5s forwards; animation-delay: 0.2s;">
            <h2>Efficiency in Compression</h2>
            <p>Lempel-Ziv encoding can compress data without losing any information. It achieves this by identifying and storing recurring patterns, replacing redundant sequences with shorter references, and greatly reducing file size.</p>
        </div>

        <div class="feature-card" style="animation: fadeIn 0.5s forwards; animation-delay: 0.4s;">
            <h2>Algorithm Flexibility</h2>
            <p>The algorithm is highly adaptable and works well with various types of data, from text and binary files to multimedia formats. This versatility has made it a foundation for file compression formats like ZIP, GIF, and PNG.</p>
        </div>

        <div class="feature-card" style="animation: fadeIn 0.5s forwards; animation-delay: 0.6s;">
            <h2>Decompression Accuracy</h2>
            <p>With Lempel-Ziv encoding, data is restored to its original form upon decompression. This lossless nature ensures that every bit of information remains intact, making it essential in fields where precision is crucial.</p>
        </div>

        <div class="feature-card" style="animation: fadeIn 0.5s forwards; animation-delay: 0.8s;">
            <h2>Widespread Application</h2>
            <p>Lempel-Ziv encoding is a core technology behind numerous data compression standards. Whether you're streaming media, transferring files, or storing data, chances are Lempel-Ziv or its derivatives play a role in the process.</p>
        </div>

        <div class="feature-card" style="animation: fadeIn 0.5s forwards; animation-delay: 1s;">
            <h2>Memory and Performance Optimization</h2>
            <p>The encoding process requires only a modest amount of memory and processing power, making it suitable for real-time applications and devices with limited resources.</p>
        </div>
    </section>
</body>
</html>
{% endblock %}
```

Contact.py

```
{% block content %}
```

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">


    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Contact Us</title>
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.4/css/all.min.css"> <!-- Font
Awesome for icons -->
    <style>
        body {
            font-family: 'Arial', sans-serif;
            background-color: #f0f4ff;
            margin: 0;
            padding: 0;
            color: #333;
        }
        header {
            background-color: #0047ab;
            padding: 20px;
            text-align: center;
            color: white;
            font-size: 2.5em;
            box-shadow: 0 2px 10px rgba(0, 0, 0, 0.1);
        }
        nav {
            display: flex;
            justify-content: center;
            background-color: #87cefa;
            padding: 10px 0;
            box-shadow: 0 2px 5px rgba(0, 0, 0, 0.2);
        }
        nav button {
            background-color: #4682b4;
            border: none;
            color: white;
            padding: 10px 20px;
            margin: 0 10px;
            cursor: pointer;
            font-size: 1em;
            border-radius: 5px;
            transition: background-color 0.3s ease, transform 0.3s ease;
        }
        nav button:hover {
            background-color: #0056b3;
            transform: scale(1.05);
        }
        section {
            max-width: 600px;
            margin: 50px auto;
            padding: 20px;
            background-color: white;
            border-radius: 10px;
            box-shadow: 0 4px 20px rgba(0, 0, 0, 0.1);
            animation: fadeIn 0.5s;
            text-align: center;
        }
        @keyframes fadeIn {
            from { opacity: 0; }
            to { opacity: 1; }
        }
        h2 {
            color: #0047ab;
            margin-bottom: 20px;
```

```
        }
        .contact-info {
            margin-bottom: 20px;
            text-align: left; /* Align text to the left for better readability */


    }
        .contact-info h3 {
            margin-bottom: 10px;
            color: #007bff;
        }
        .contact-info p {
            margin: 5px 0;
            line-height: 1.5; /* Improve readability with line height */
        }
        .footer {
            text-align: center;
            margin-top: 20px;
            color: #777;
        }
        .social-media {
            margin-top: 15px;
        }
        .social-media a {
            color: #0047ab;
            margin: 0 10px;
            text-decoration: none;
            font-size: 1.5em;
        }
        .social-media a:hover {
            color: #0056b3;
        }
        .icon {
            margin-right: 10px; /* Spacing between icon and text */
            color: #007bff; /* Color for icons */
        }
        .contact-method {
            display: flex;
            align-items: center; /* Center the items vertically */
            margin: 10px 0; /* Spacing between methods */
        }
    </style>
</head>
<body>
    <header>
        Contact Us
    </header>

    <nav>
        <button onclick="window.location.href='{% url 'base:home' %}';">Home</button>
        <button onclick="window.location.href='{% url 'base:aboutus' %}'">About Us</button>
        <button onclick="window.location.href='{% url 'base:contactus' %}'">Contact Us</button>
        <button onclick="window.location.href='{% url 'base:f' %}'">Features</button>
    </nav>

    <section>
        <h2>Get in Touch with Us</h2>
        <div class="contact-info">
            <h3>Company Name</h3>
            <p>Data Encoding Solutions</p>

            <h3>Contact Methods</h3>
            <div class="contact-method">
                <i class="fas fa-envelope icon"></i>
                <p>Email: <a href="mailto:support@dataencoding.com">support@dataencoding.com</a></p>
```

```
            </div>
            <div class="contact-method">
                <i class="fas fa-phone-alt icon"></i>
                <p>Phone: <a href="tel:+1234567890">(123) 456-7890</a></p>


    </div>
            <div class="contact-method">
                <i class="fas fa-map-marker-alt icon"></i>
                <p>Address: 123 Data St, Tech City, TX, 12345</p>
            </div>
            <div class="contact-method">
                <i class="fas fa-clock icon"></i>
                <p>Business Hours: Monday to Friday: 9 AM - 5 PM</p>
                <p>Saturday: 10 AM - 4 PM</p>
                <p>Sunday: Closed</p>
            </div>

            <h3>Follow Us</h3>
            <div class="social-media">
                <a href="https://www.facebook.com/YourCompany" target="_blank"><i class="fab fa-facebook-
f"></i></a>
                <a href="https://twitter.com/YourCompany" target="_blank"><i class="fab fa-twitter"></i></a>
                <a href="https://www.linkedin.com/company/YourCompany" target="_blank"><i class="fab fa-linkedin-
in"></i></a>
            </div>
        </div>
        <div class="footer">
            <p>We appreciate your interest in Data Encoding Solutions and look forward to assisting you!</p>
        </div>
    </section>
</body>
</html>

{% endblock %}
```

About.py

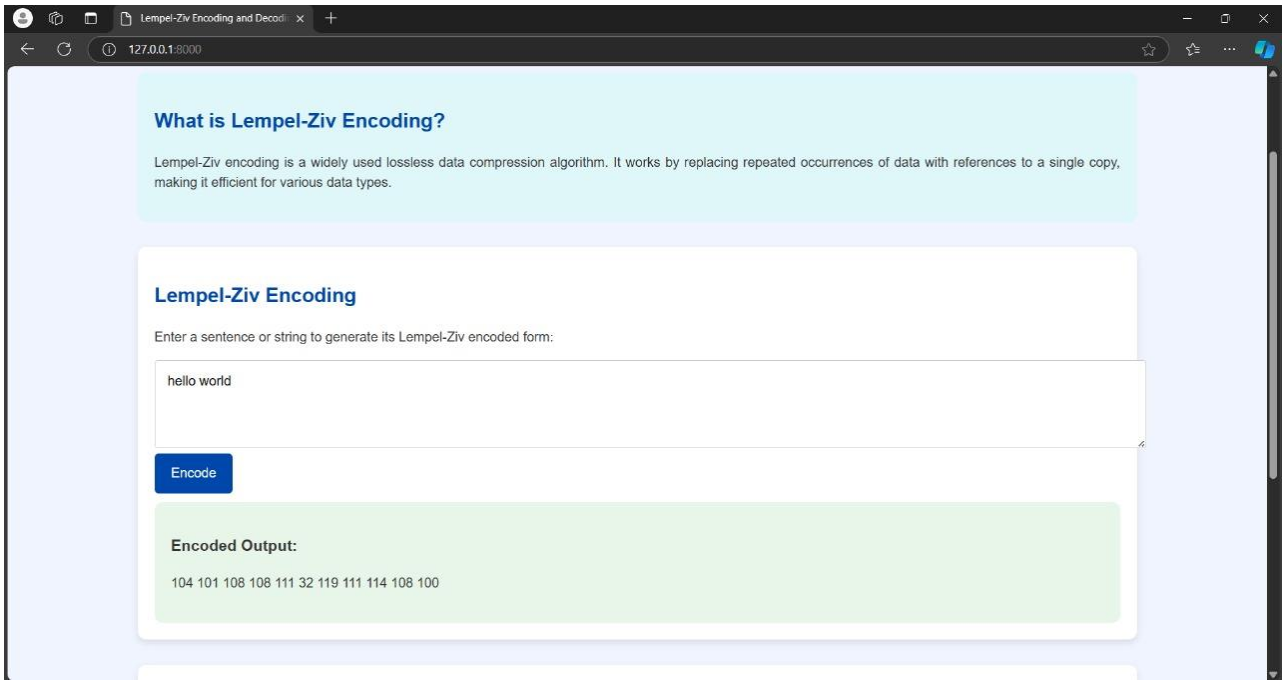
```
{% block content %}
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>About Us</title>
    <style>
        body {
            font-family: 'Arial', sans-serif;
            background-color: #f0f4ff;
            margin: 0;
            padding: 0;
            color: #333;
        }
        header {
            background-color: #0047ab;
            padding: 20px;
            text-align: center;
            color: white;
            font-size: 2em;
        }
        nav {
            display: flex;
            justify-content: center;
```

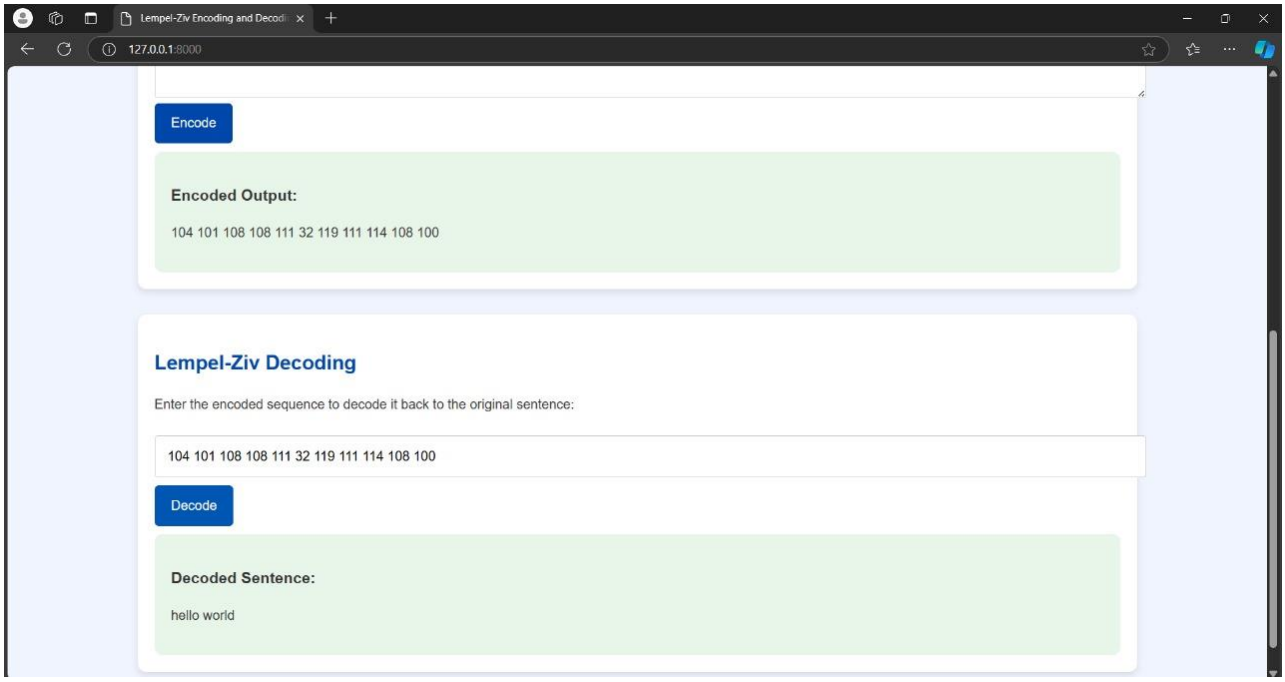
```
            background-color: #87cefa;
            padding: 10px 0;
        }
        nav button {


            background-color: #4682b4;
            border: none;
            color: white;
            padding: 10px 20px;
            margin: 0 10px;
            cursor: pointer;
            font-size: 1em;
            border-radius: 5px;
            transition: background-color 0.3s ease;
        }
        nav button:hover {
            background-color: #0056b3;
        }
        section {
            max-width: 1200px;
            margin: 0 auto;
            padding: 20px;
        }
        .intro {
            background-color: #e0f7fa;
            padding: 20px;
            border-radius: 10px;
            margin-bottom: 30px;
            text-align: justify;
        }
        .card {
            background-color: white;
            padding: 20px;
            border-radius: 10px;
            box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);
            margin-bottom: 30px;
            opacity: 0;
            transform: scale(0.95);
            transition: transform 0.3s ease, opacity 0.3s ease;
        }
        h2 {
            color: #0047ab;
        }
        p {
            line-height: 1.6;
            margin-bottom: 15px;
        }
        .card:hover {
            transform: scale(1.05);
        }
    </style>
</head>
<body>
    <header>
        About Us
    </header>

    <nav>
        <button onclick="window.location.href='{% url 'base:home' %}';">Home</button>
        <button onclick="window.location.href='{% url 'base:aboutus' %}'">About Us</button>
        <button onclick="window.location.href='{% url 'base:contactus' %}'">Contact Us</button>
        <button onclick="window.location.href='{% url 'base:f' %}'">Features</button>

    </nav>
```

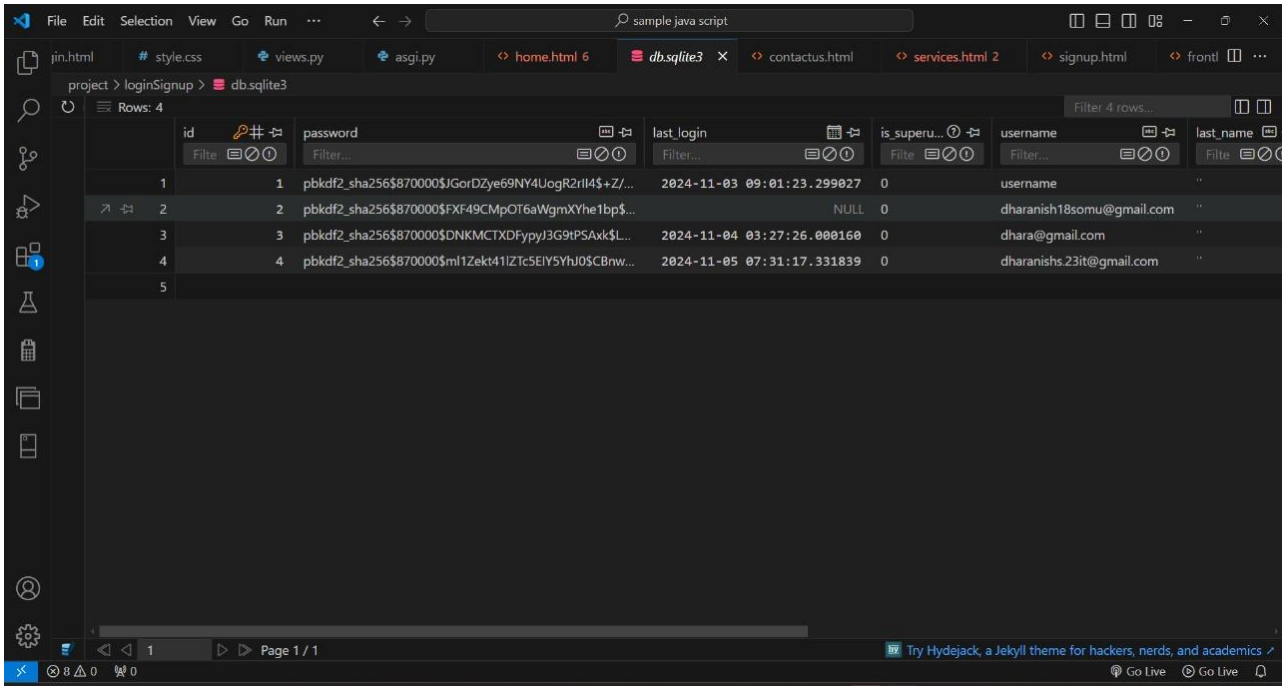
```
<section>
    <div class="intro">
        <h2>Welcome to Our Website</h2>


        <p>We are dedicated to providing comprehensive resources on data compression techniques, specifically focusing on algorithms like Lempel-Ziv and Huffman Encoding. Our goal is to make complex concepts accessible to everyone, from students to professionals in the field.</p>
        <p>Data compression plays a crucial role in modern computing, enabling efficient data storage and transmission. As the volume of digital information continues to grow exponentially, the need for effective compression methods has never been more critical. By exploring various encoding techniques, we aim to help our users understand the fundamental principles that underpin these technologies.</p>
    </div>

    <div class="card" style="animation: fadeIn 0.5s forwards; animation-delay: 0.2s;">
        <h2>Our Mission</h2>
        <p>Our mission is to educate and empower individuals interested in data compression and information theory. We aim to provide clear, concise, and accurate information on various encoding techniques, enabling users to understand and apply these methods in practical scenarios.</p>
        <p>We believe that a solid understanding of data compression can enhance skills in programming, data analysis, and digital communication, opening new avenues for innovation and creativity.</p>
    </div>

    <div class="card" style="animation: fadeIn 0.5s forwards; animation-delay: 0.4s;">
        <h2>Meet the Team</h2>
        <p>Our team consists of experienced professionals and enthusiasts in computer science and data processing. We are passionate about technology and committed to sharing our knowledge with others.</p>
        <ul>
            <li><strong>John Doe</strong> - Lead Developer</li>
            <li><strong>Jane Smith</strong> - Data Scientist</li>
            <li><strong>Emily Johnson</strong> - Content Writer</li>
        </ul>
        <p>Together, we strive to create an engaging and informative platform that caters to learners at all levels.</p>
    </div>

    <div class="card" style="animation: fadeIn 0.5s forwards; animation-delay: 0.6s;">
        <h2>The Importance of Data Compression</h2>
        <p>In today's digital age, data compression is a key technology that facilitates the efficient storage and transmission of information. Whether it's sending a file via email, streaming a video, or storing images, effective compression algorithms like Lempel-Ziv are integral to optimizing performance and user experience.</p>
        <p>Understanding these algorithms not only helps in selecting the right tools for data management but also enhances problem-solving skills in software development and data science.</p>
    </div>

    <div class="card" style="animation: fadeIn 0.5s forwards; animation-delay: 0.8s;">
        <h2>Contact Us</h2>
        <p>If you have any questions, feedback, or inquiries, feel free to reach out to us:</p>
        <ul>
            <li>Email: support@dataencoding.com</li>
            <li>Phone: (123) 456-7890</li>
            <li>Address: 123 Data St, Tech City, TX, 12345</li>
        </ul>
        <p>We value your input and are always here to help!</p>
    </div>
</section>

<style>
    @keyframes fadeIn {
        from {
            opacity: 0;
            transform: translateY(20px);
        }
        to {
            opacity: 1;
```

```
            transform: translateY(0);
        }
    }
</style>


</body>
</html>

{% endblock %}
```

OUTPUT :






File Edit Selection View Go Run
sample java script
style.css
views.py
asgi.py
home.html 6
db.sqlite3
contactus.html
services.html 2
signup.html
project > loginSignup > db.sqlite3
Rows: 4
Filter 4 rows...
id
password
last_login
is_superu...
username
last_name
1 1 pbkdf2_sha256$870000$JGorDZye69NY4UogR2rII4$+Z/... 2024-11-03 09:01:23.299027 0 username
2 2 pbkdf2_sha256$870000$FXF49CMpOT6aWgmXYhe1bp$... NULL 0 dharanish18somu@gmail.com
3 3 pbkdf2_sha256$870000$DNKMCTXDFypyJ3G9tPSAxk$L... 2024-11-04 03:27:26.000160 0 dhara@gmail.com
4 4 pbkdf2_sha256$870000$ml1Zekt41lZTc5EIY5YhJ0$CBnw... 2024-11-05 07:31:17.331839 0 dharanishs.23it@gmail.com
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