EXP NO: 9	MINI PROJECT – POTHOLE PREDICTION MODEL

AIM:

To predict future stock prices using historical time series data by implementing a **Linear Regression** model, and to evaluate its performance in forecasting trends.

ALGORITHM:

1. Data Collection: Obtain historical stock price data (e.g., from Yahoo Finance).
2. Data Preprocessing:
3. Handle missing values.
4. Convert date columns to datetime format.
5. Sort data chronologically.
6. Feature Selection:
7. Use relevant features such as Open, High, Low, Close prices, and Volume.
8. Create lag features if needed for prediction.
9. Train-Test Split: Divide the data into training and testing sets (e.g., 80%-20%).
10. Model Training: Fit a Linear Regression model using the training data.
11. Prediction: Use the trained model to predict stock prices on the test set.
12. Evaluation: Assess the model performance using metrics like Mean Squared Error (MSE), Root Mean Squared Error (RMSE), and R^2 score.
13. Visualization: Plot actual vs predicted stock prices to observe forecasting accuracy.

CODE:

Index.html

```
<!DOCTYPE html>
<html>
<head>
 <meta charset="UTF-8">
 <title>Stock Price Predictor Web App</title>
 <link href='https://fonts.googleapis.com/css?family=Pacifico' rel='stylesheet'>
 <link href='https://fonts.googleapis.com/css?family=Arimo' rel='stylesheet'>
 <link href='https://fonts.googleapis.com/css?family=Hind:300' rel='stylesheet'>
      <link       href='https://fonts.googleapis.com/css?family=Open+Sans+Condensed:300'
rel='stylesheet'>
                                 <link                              rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.min.css">
 <style>
  body {
```

```
    font-family: 'Arimo', sans-serif;
    background-color: #f0f8ff;
    padding: 50px;
   }
   .login {
    max-width: 500px;
    margin: auto;
    background: white;
    padding: 30px;
    border-radius: 10px;
    box-shadow: 0px 0px 10px 0px gray;
   }
   h1, h2 {
    color: #1e81b0;
   }
   .footer-dark {
    text-align:  center;
    margin-top: 40px;
    padding: 20px;
    background-color: #1e81b0;
    color: white;
   }
  </style>
</head>
<body style="background-color: greenyellow; font-family: cursive ;">

<div class="login" style="background-color: aqua">
 <h1 style="color: black;">Pothole  Predictor</h1>
  <h2 style="color: black;">Welcome, {{ username }}!</h2>

  <form action="{{ url_for('dashboard') }}" method="post">
    <input type="number" name="Open" placeholder="Opening Price" class="form-control
mb-3" required>
    <input type="number" name="High" placeholder="Highest Price" class="form-control
mb-3" required>
   <input type="number" name="Low" placeholder="Lowest Price" class="form-control mb-
3" required>
    <input type="number" name="Volume" placeholder="Volume" class="form-control mb-
3" required>
    <button type="submit" class="btn btn-primary w-100" style= "background-color: green;
```

```
color: black;">Predict</button>
 </form>


 <br>
 <h4 class="text-success" style="background-color: white; color: black;">{{ prediction_text
}}</h4>
</div>


<div class="footer-dark">
 <footer>
  <div class="container">
   <p class="copyright">Pothole Predictor © 2025</p>
  </div>
 </footer>
</div>


<script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"></script>
</body>
</html>
```

Home.html

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <title>Stock Price Prediction</title>
                                          <link                    rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/animate.css/4.1.1/animate.min.css"/>
          <link      rel="stylesheet"      href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/6.4.2/css/all.min.css">
   <style>
     .head {
        color: #1e81b0;
     }
     .bt {
        background-color: #1e81b0;
     }
     html {
        scroll-behavior: smooth;
```

```html
    }
  </style>
    <link    href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.min.css"
rel="stylesheet">
</head>
<body style="background-color: greenyellow; font-family: cursive;">

  <!-- Header Section -->
  <div class="container">
    <header class="d-flex flex-wrap justify-content-center py-3 mb-4 border-bottom">
        <a href="/" class="d-flex align-items-center mb-3 mb-md-0 me-md-auto link-body-
emphasis text-decoration-none">
                <img  src="/static/image/stock_icon.png"  width="50px"  height="50px"
class="rounded shadow-lg" alt="">
            <span class="fs-3 m-3 fw-bold head" style="color: red"><i class="fas fa-chart-
line"></i> Stock Price Prediction</span>
        </a>

        <ul class="nav nav-pills">
            <li class="nav-item"><a href="{{ url_for('home') }}" class="nav-link link-light"
style="background-color: red">Home</a></li>
                            <li    class="nav-item"><a    href="#features"    class="nav-link"
style="color:red">Features</a></li>
                                <li    class="nav-item"><a    href="#about"    class="nav-link"
style="color:red">About</a></li>
                <li class="nav-item"><a href="{{ url_for('register') }}" class="nav-link"
style="color:red">Register</a></li>
                    <li  class="nav-item"><a  href="{{  url_for('login')  }}"  class="nav-link"
style="color:red">Login</a></li>
            <li class="nav-item"><a href="{{ url_for('login') }}" class="btn btn-lg text-light
fw-bold" style="background-color: green">Get Started</a></li>
        </ul>
    </header>
  </div>

  <!-- Hero Section -->
  <div class="container col-xxl-8">
    <div class="row flex-lg-row-reverse align-items-center g-5 py-5">
      <div class="col-10 col-sm-8 col-lg-6 animate__animated animate__zoomIn">
                <img  src="/static/image/stock.png"  class="d-block  mx-lg-auto  img-fluid"
```

```
alt="Stock Market" width="700" height="500" loading="lazy">
        </div>
        <div class="col-lg-6 animate__animated animate__slideInLeft" style="color: black;">
                <h1 class="display-5 fw-bold lh-1 mb-3" style="color: red">Stock Price
Prediction</h1>
            <p class="lead">Stock Price Prediction estimates stock values using machine
learning models based on features like opening price, highest price, lowest price, volume, and
market trends.</p>
        <div class="d-grid gap-2 d-md-flex justify-content-md-start">
            <a href="/login"><button type="button" class="btn btn-lg px-4 me-md-2 text-
light fw-bold" style="background-color:green">Get Started</button></a>
        </div>
    </div>
    </div>
    </div>


    <!-- Features Section -->
    <div class="container py-5" id="features">
        <h2 class="text-center head animate__animated animate__fadeInDown" style="color:
red;">Features</h2>
        <div class="row text-center">
        <div class="col-md-4 animate__animated animate__zoomIn">
                <h4 style="color: blueviolet"><i class="fas fa-chart-line"></i> Accurate
Predictions</h4>
            <p>Our model uses advanced machine learning algorithms to estimate stock prices
with high accuracy.</p>
        </div>
        <div class="col-md-4 animate__animated animate__zoomIn">
            <h4 style="color: blueviolet;"><i class="fas fa-clock"></i> Real-Time Data</h4>
            <p>Stay updated with real-time stock market trends and price changes.</p>
        </div>
        <div class="col-md-4 animate__animated animate__zoomIn">
            <h4 style="color: blueviolet;"><i class="fas fa-user"></i> User-Friendly</h4>
            <p>Easy-to-use interface for investors, traders, and analysts.</p>
        </div>
    </div>
    </div>


    <!-- About Section -->
    <div class="container py-5" id="about">
```

```
        <h2 class="text-center head animate__animated animate__fadeInLeft" style="color:
red;">About Us</h2>
    <div class="row align-items-center">
        <div class="col-md-6">
            <p>Stock Price Prediction is a tool that utilizes machine learning to estimate stock
values based on key features like historical data, market trends, and economic indicators. Our
goal is to provide reliable and insightful predictions to help investors make informed
decisions.</p>
        </div>
        <div class="col-md-6 animate__animated animate__fadeInRight">
            <img src="/static/image/stock_llllll.avif" class="img-fluid rounded " alt="About
Us">
        </div>
    </div>
  </div>


  <!-- Footer Section -->
  <div class="container">
    <footer class="py-3 my-4">
      <p class="text-center text-body-secondary">&copy; 2025 Company, Inc</p>
    </footer>
  </div>


                                                                              <script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"></script>
</body>
</html>
```

Login.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Login</title>
    <link    href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.min.css"
rel="stylesheet">
  <style>
    body {
      height: 100vh;
      display: flex;
```

```
        align-items: center;
        justify-content: center;
      }
      .login-container {
        border-radius: 10px;
        overflow: hidden;
      }
  </style>
</head>
<body style="background-color: greenyellow;">
  <div class="container">
    <div class="row login-container" >
      <!-- Left Side Image -->
      <div class="col-md-6" style="margin-top: 50px;" >
        <img src="/static/image/reg.jpg" class="w-100">
      </div>

      <!-- Right Side Form -->
      <div class="col-md-6 p-5" >
            <div class="shadow-lg p-5 m-5 bordered rounded" style="background-color:
aqua;">
            <h2 class="text-center mb-4" style="font-family: cursive;">Login</h2>
            <form action="/login" method="post">
              <div class="mb-3">
                 <label for="username" class="form-label" style="color: blue; font-family:
cursive;">Username</label>
                    <input type="text" class="form-control" name="username" id="username"
placeholder="Enter your username" required>
              </div>
              <div class="mb-3">
                 <label for="password" class="form-label" style="color: blue; font-family:
cursive;">Password</label>
                            <input type="password" class="form-control" name="password"
id="password" placeholder="Enter your password" required>
              </div>
              <div class="d-grid">
                  <button type="submit" class="btn" style="background-color: green; font-
family: cursive;">Login</button>
              </div>
              <div class="text-center mt-3" style="font-family: cursive;">
```

```html
            <p>Don't have an account? <a href="Register.html" class="text-primary"
>Register</a></p>
                </div>
            </form>
        </div>
      </div>
    </div>


                                                                    <script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"></script>
</body>
</html>
```

Register.html

```html
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <title>Register</title>
       <link    href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.min.css"
rel="stylesheet">
   <style>
     body {
        height: 100vh;
        display: flex;
        align-items: center;
        justify-content: center;

     }
     .register-container {

        border-radius: 10px;
        overflow: hidden;

     }

   </style>
</head>
```

```html
<body style="background-color: greenyellow; font-family: cursive;">
  <div class="container">
    <div class="row register-container">
      <!-- Left Side Image -->
      <div class="col-md-6" style="margin-top: 150px;">
        <img src="/static/image/reg.jpg" class="w-100" >
      </div>


      <!-- Right Side Form -->
      <div class="col-md-6 p-5 " >
           <div class="shadow-lg p-5 m-5 bordered rounded" style="background-color:
aqua;">
          <h2 class="text-center mb-4" style="color: black">Register</h2>
          <form action="/Register" method="post">
            <div class="mb-3" >
              <label for="name" class="form-label" style="color: blue;">Name</label>
                  <input type="text" class="form-control" name="username" id="name"
placeholder="Enter your name" required>
            </div>
            <div class="mb-3">
              <label for="gender" class="form-label" style="color: blue;">Gender</label>
              <select class="form-control" name="gender" id="gender" required>
                <option value="">Select Gender</option>
                <option value="Male">Male</option>
                <option value="Female">Female</option>
                <option value="Other">Other</option>
              </select>
            </div>
            <div class="mb-3">
              <label for="age" class="form-label" style="color: blue;">Age</label>
                     <input type="number" class="form-control" name="age" id="age"
placeholder="Enter your age" required>
            </div>
            <div class="mb-3">
                              <label  for="password"  class="form-label"  style="color:
blue;">Password</label>
                       <input type="password" class="form-control" name="password"
id="password" placeholder="Enter password" required>
            </div>
            <div class="d-grid">
```

```html
                                          <button type="submit" class="btn" style="background-color:
green;">Register</button>
            </div>
            <div class="text-center mt-3">
                <p>Already have an account? <a href="/login" class="text-primary">Sign
In</a></p>
            </div>
        </form>
        </div>
      </div>
    </div>
  </div>


                                                                             <script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"></script>
</body>
</html>
```

Style.css

```css
@import url(https://fonts.googleapis.com/css?family=Open+Sans);
.btn { display: inline-block; *display: inline; *zoom: 1; padding: 4px 10px 4px; margin-
bottom: 0; font-size: 13px; line-height: 18px; color: #333333; text-align: center;text-shadow:
0 1px 1px rgba(255, 255, 255, 0.75); vertical-align: middle; background-color: #f5f5f5;
background-image: -moz-linear-gradient(top, #ffffff, #e6e6e6); background-image: -ms-
linear-gradient(top, #ffffff, #e6e6e6); background-image: -webkit-gradient(linear, 0 0, 0 100%,
from(#ffffff), to(#e6e6e6)); background-image: -webkit-linear-gradient(top, #ffffff, #e6e6e6);
background-image: -o-linear-gradient(top, #ffffff, #e6e6e6); background-image: linear-
gradient(top,        #ffffff,        #e6e6e6);        background-repeat:        repeat-x;        filter:
progid:dximagetransform.microsoft.gradient(startColorstr=#ffffff,        endColorstr=#e6e6e6,
GradientType=0); border-color: #e6e6e6 #e6e6e6 #e6e6e6; border-color: rgba(0, 0, 0, 0.1)
rgba(0, 0, 0, 0.1) rgba(0, 0, 0, 0.25); border: 1px solid #e6e6e6; -webkit-border-radius: 4px; -
moz-border-radius: 4px; border-radius: 4px; -webkit-box-shadow: inset 0 1px 0 rgba(255, 255,
255, 0.2), 0 1px 2px rgba(0, 0, 0, 0.05); -moz-box-shadow: inset 0 1px 0 rgba(255, 255,
255, 0.2), 0 1px 2px rgba(0, 0, 0, 0.05); box-shadow: inset 0 1px 0 rgba(255, 255, 255, 0.2), 0
1px 2px rgba(0, 0, 0, 0.05); cursor: pointer; *margin-left: .3em; }
.btn:hover, .btn:active, .btn.active, .btn.disabled, .btn[disabled] { background-color: #e6e6e6;
}
.btn-large { padding: 9px 14px; font-size: 15px; line-height: normal; -webkit-border-radius:
5px; -moz-border-radius: 5px; border-radius: 5px; }
.btn:hover { color: #333333; text-decoration: none; background-color: #e6e6e6; background-
position: 0 -15px; -webkit-transition: background-position 0.1s linear; -moz-transition:
```

```css
background-position 0.1s linear; -ms-transition: background-position 0.1s linear; -o- transition:
background-position 0.1s linear; transition: background-position 0.1s linear; }
.btn-primary, .btn-primary:hover { text-shadow: 0 -1px 0 rgba(0, 0, 0, 0.25); color: #ffffff; }
.btn-primary.active { color: rgba(255, 255, 255, 0.75); }
.btn-primary { background-color: #4a77d4; background-image: -moz-linear-gradient(top,
#6eb6de, #4a77d4); background-image: -ms-linear-gradient(top, #6eb6de, #4a77d4);
background-image: -webkit-gradient(linear, 0 0, 0 100%, from(#6eb6de), to(#4a77d4));
background-image: -webkit-linear-gradient(top, #6eb6de, #4a77d4); background-image: -o-
linear-gradient(top, #6eb6de, #4a77d4); background-image: linear-gradient(top, #6eb6de,
#4a77d4);                    background-repeat:                    repeat-x;                    filter:
progid:dximagetransform.microsoft.gradient(startColorstr=#6eb6de,    endColorstr=#4a77d4,
GradientType=0); border: 1px solid #3762bc; text-shadow: 1px 1px 1px rgba(0,0,0,0.4); box-
shadow: inset 0 1px 0 rgba(255, 255, 255, 0.2), 0 1px 2px rgba(0, 0, 0, 0.5); }
.btn-primary:hover, .btn-primary:active, .btn-primary.active, .btn-primary.disabled, .btn-
primary[disabled] { filter: none; background-color: #4a77d4; }
.btn-block { width: 100%; display:block; }


* { -webkit-box-sizing:border-box; -moz-box-sizing:border-box; -ms-box-sizing:border-box;
-o-box-sizing:border-box; box-sizing:border-box; }


html { width: 100%; height:100%; overflow:hidden; }


body {
   width: 100%;
   height:100%;
   font-family: 'Open Sans', sans-serif;
   background: #1e81b0;
   color: #fff;
   font-size: 18px;
   text-align:center;
   letter-spacing:1.2px;
        filter:    progid:DXImageTransform.Microsoft.gradient(    startColorstr='#3E1D6D',
endColorstr='#092756',GradientType=1 );


}
.login {
   position: absolute;
   top: 40%;
   left: 50%;
   margin: -150px 0 0 -150px;
```

```css
    width:400px;
    height:400px;
}

.login h1 { color: #fff; text-shadow: 0 0 10px rgba(0,0,0,0.3); letter-spacing:1px; text-
align:center; }

input {
    width: 100%;
    margin-bottom: 10px;
    background: rgba(0,0,0,0.3);
    border: none;
    outline: none;
    padding: 10px;
    font-size: 13px;
    color: #fff;
    text-shadow: 1px 1px 1px rgba(0,0,0,0.3);
    border: 1px solid rgba(0,0,0,0.3);
    border-radius: 4px;
    box-shadow: inset 0 -5px 45px rgba(100,100,100,0.2), 0 1px 1px rgba(255,255,255,0.2);
    -webkit-transition: box-shadow .5s ease;
    -moz-transition: box-shadow .5s ease;
    -o-transition: box-shadow .5s ease;
    -ms-transition: box-shadow .5s ease;
    transition: box-shadow .5s ease;
}
input:focus { box-shadow: inset 0 -5px 45px rgba(100,100,100,0.4), 0 1px 1px
rgba(255,255,255,0.2); }

.footer-dark .copyright {
    text-align:center;
    padding-top:24px;
    opacity:0.3;
    font-size:13px;
    margin-bottom:0;
  }
```
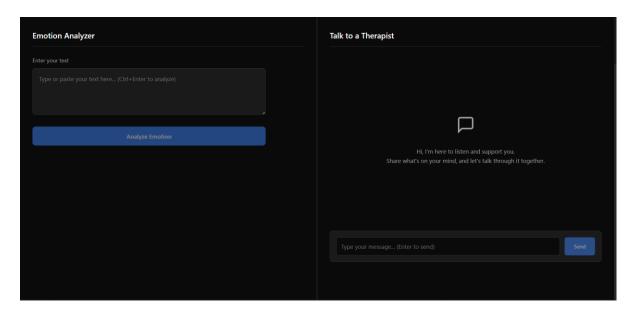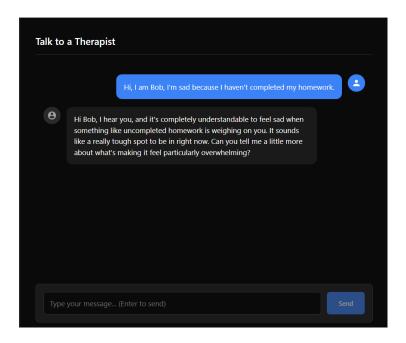
App.py

```python
from flask import Flask, render_template, request, redirect, url_for, flash
from flask_sqlalchemy import SQLAlchemy
from flask_login import LoginManager, UserMixin, login_user, login_required, logout_user,
```
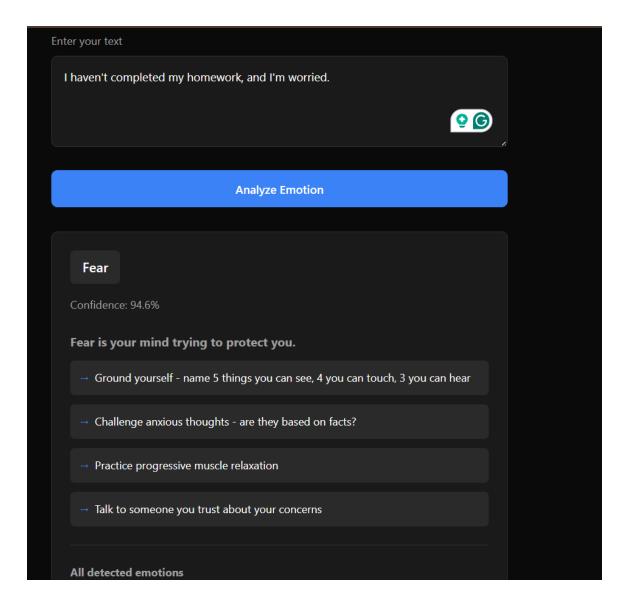
```python
current_user

app = Flask(__name__)
app.config['SECRET_KEY'] = '1233444545555'
app.config['SQLALCHEMY_DATABASE_URI'] = 'sqlite:///site.db'
db = SQLAlchemy(app)

login_manager = LoginManager(app)
login_manager.login_view = 'login'

# --- Models ---
class User(UserMixin, db.Model):
    id = db.Column(db.Integer, primary_key=True)
    username = db.Column(db.String(150), unique=True, nullable=False)
    password = db.Column(db.String(150), nullable=False)

@login_manager.user_loader
def load_user(user_id):
    return User.query.get(int(user_id))

# --- Routes ---
@app.route('/')
def home():
    return render_template('home.html')

@app.route('/Register', methods=['GET', 'POST'])
def register():
    if request.method == 'POST':
        username = request.form['username']
        password = request.form['password']
        existing = User.query.filter_by(username=username).first()
        if existing:
            flash('User already exists', 'error')
            return redirect(url_for('register'))
        user = User(username=username, password=password)
        db.session.add(user)
        db.session.commit()
        flash('Registered successfully', 'success')
        return redirect(url_for('login'))
    return render_template('Register.html')
```

```python
@app.route('/login', methods=['GET', 'POST'])
def login():
    if request.method == 'POST':
        username = request.form['username']
        password = request.form['password']
        user = User.query.filter_by(username=username, password=password).first()
        if user:
            login_user(user)
            return redirect(url_for('dashboard'))
        flash('Invalid credentials', 'error')
    return render_template('Login.html')


@app.route('/dashboard', methods=['GET', 'POST'])
@login_required
def dashboard():
    prediction_text = ""
    if request.method == 'POST':
        open_price = request.form['Open']
        high = request.form['High']
        low = request.form['Low']
        volume = request.form['Volume']
        # Dummy logic (replace with your ML model)
        predicted_price = (float(open_price) + float(high) + float(low)) / 3
        prediction_text = f"Predicted Stock Price: ₹{predicted_price:.2f}"
            return    render_template('index.html',    username=current_user.username,
prediction_text=prediction_text)


@app.route('/logout')
@login_required
def logout():
    logout_user()
    return redirect(url_for('login'))


with app.app_context():
    db.create_all()


if __name__ == '__main__':
    app.run(debug=True)
```

RESULT:

      The Linear Regression model was successfully trained and used to predict stock prices. The predicted values closely followed the actual prices, showing that the model effectively captured the overall trend of the stock data.