```
import datetime
import re
 import streamlit as st
import pandas as pd
import csv
 import os
 import time
 import matplotlib.pyplot as plt
 import seaborn as sns
import random
from classes import * # import classes
st.set page config(
       page_title="Employee Performance Tracker",
layout="wide"
 # Initialize session state
if 'authenticated' not in st.session_state:
    st.session_state.authenticated = False
if 'current_user' not in st.session_state:
       st.session state.current user = None
if 'current_call' not in st.session_state:
    st.session_state.current_call = None
if 'workday_started' not in st.session_state:
    st.session_state.workday_started = False
DATA DIR = "data"
os.makedirs(DATA_DIR, exist_ok=True)
 # File paths
" File Pauls
STAFF_FILE = os.path.join(DATA_DIR, "staff_details.csv")
CALLS_FILE = os.path.join(DATA_DIR, "call_details.csv")
TEAMS_FILE = os.path.join(DATA_DIR, "team_details.csv")
MANAGERS_FILE = os.path.join(DATA_DIR, "manager_details.csv")
# Initialize CSV files if they don't exist
def initialize_files():
            Initialize CSV files with default data if they don't exist.
       Creates four CSV files (staff_details.csv, call_details.csv, team_details.csv, manager_details.csv) in the data directory with sample data if they don't already exist.
       if not os.path.exists(STAFF_FILE):
    with open(STAFF_FILE, 'w', new
                    'working_time_elapsed', 'avg_sat_score', 'status', 'team_id'])
                    # Sample staff data writer.writerow(['101', 'John', 'Doe', '1', '2', '0', '0', '10', '0', '0.825', 'Free', '1']) writer.writerow(['102', 'Jane', 'Smith', '1', '1', '0', '0', '10', '0', '0.8', 'Free', '1']) writer.writerow(['201', 'Mike', 'Johnson', '2', '1', '0', '0', '10', '0', '0.6', 'Free', '2'])
       if not os.path.exists(CALLS_FILE):
              with open(CALLS_FILE, 'w', newline='') as f:
    writer = csv.writer(f)
                      writer.writerow(['cal1_id', 'status', 'time_elapsed', 'sat_score', 'handler_id', 'date', 'team_id'])
                      # Sample call data
                     now = int(time time())
                    now = int(time())
writer.writerow([f'{now}001', 'Completed', '120', '0.95', '101', '26/06/2025 15:36', '1'])
writer.writerow([f'{now}002', 'Completed', '180', '0.7', '101', '19/07/2025 18:16', '1'])
writer.writerow([f'{now}003', 'Completed', '90', '0.8', '102', '07/07/2025 08:07', '1'])
writer.writerow([f'{now}004', 'Completed', '150', '0.6', '201', '10/07/2025 16:49', '2'])
       if not os.path.exists(TEAMS_FILE):
              with open(TEAMS_FILE, 'w', newline='') as f:
    writer = csv.writer(f)
                    writer.writerow(['team_id', 'team_name', 'manager_id'])
writer.writerow(['1', 'Customer Support East', '1'])
writer.writerow(['2', 'Customer Support West', '2'])
        if not os.path.exists(MANAGERS_FILE):
              with open(MANAGERS_FILE, 'w', newline='') as f:
    writer = csv.writer(f)
                    writer = csv.writer(r)
writer.writerow(['manager_id', 'manager_first_name', 'manager_last_name', 'staff_list'])
writer.writerow([1, 'David', 'Cooper', [101, 102]])
writer.writerow([2, 'Shirley', 'McDonald', [201]])
 # Load data functions with class instantiation
 @st.cache data
def load_staff_data() -> tuple[pd.DataFrame, list[Staff]]:
           "Load staff data from CSV file and create Staff objects
             tuple: A tuple containing:
                    - pd.DataFrame: DataFrame with raw staff data
- list[Staff]: List of Staff objects initialized with the data
       df = pd.read_csv(STAFF_FILE)
       staff_objects = []
for _, row in df.iterrows():
    staff = Staff(
                    ff = Staff(
  id=row['staff_id'],
  first_name=row['first_name'],
  last_name=row['last_name'],
  manager_id=row['manager_id'],
  manager_id=row['manager_id']
                    manager_id=row('manager_id'),
calls_taken=row('calls_taken'),
successful_calls=row['successful_calls'],
failed_calls=row['failed_calls'],
target_successful_calls=row['target_successful_calls'],
working_time_elapsed=row['working_time_elapsed'],
                    avg_sat_score=row['avg_sat_score'],
status=row['status']
       staff_objects.append(staff)
return df, staff_objects
 @st cache data
def load_calls_data() -> tuple[pd.DataFrame, list[Call]]:
          ""Load call data from CSV file and create Call objects.
              tuple: A tuple containing:
                       pd.DataFrame: DataFrame with raw call data (includes datetime conversion) list[Call]: List of Call objects initialized with the data
       df = pd.read_csv(CALLS_FILE)
       df['datetime'] = pd.to_datetime(df['date'], format='%d/%m/%Y %H:%M')
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call_objects = []
      for _, row in df.iterrows():
    call = Call(
        id=row['call_id'],
                   status=row['status'],
time_elapsed=row['time_elapsed'],
                  sat_score=row['sat_score'],
handler_id=row['handler_id']
             call.datetime = row['datetime'] # Add datetime to call object
      call_objects.append(call)
return df, call_objects
@st.cache data
def load teams data() -> pd.DataFrame:
       pd.DataFrame: DataFrame containing team information
      return pd.read_csv(TEAMS_FILE)
@st.cache data
def load_managers_data() -> tuple[pd.DataFrame, list[Manager]]:
       """Load manager data from CSV file and create Manager objects
            tuple: A tuple containing:
- pd.DataFrame: DataFrame with raw manager data
- list[Manager]: List of Manager objects initialized with the data
      df = pd.read_csv(MANAGERS_FILE)
      manager_objects = []
      for _, row in df.iterrows():
             ## Convert staff_list string to actual list
staff_list = eval(row['staff_list']) if isinstance(row['staff_list'], str) else row['staff_list']
             manager = Manager(
                  ager = Manager(
id=row['manager_id'],
first_name=row['manager_first_name'],
last_name=row['manager_last_name'],
staff_list=staff_list
             manager_objects.append(manager)
      return df, manager_objects
def authenticate(username, password):
    """Authenticate users based on username and password.
            username: The username to authenticate (format: "staffX" or "managerX") password: The password to check (currently accepts "password" for all users)
            dict or None: A dictionary containing user information if authenticated,
None if authentication fails
      staff_df, staff_objects = load_staff_data()
teams_df = load_teams_data()
manager_df, manager_objects = load_managers_data()
      for _, team in teams_df.iterrows():
    if username == f"manager{team['manager_id']}" and password == "password":
        # Find the correct manager object
                    manager = next((m for m in manager_objects if m.id == team['manager_id']), None)
                   if manager:
                        manager:
    return {
        "id": manager.id,
        "object": manager,
        "role": "manager",
        "team_id": team['team_id']
                        }
            staff_id = int(username.replace("staff", ""))
staff = next((s for s in staff_objects if s.id == staff_id), None)
if staff and password == "password":
                  return {
    "id": staff_id,
    "object": staff,
    "role": "staff",
                         "team_id": staff_df[staff_df['staff_id'] == staff_id]['team_id'].iloc[0]
       except:
            pass
      return None
def login page():
      """Render the login page and handle authentication."""
st.title("Employee Performance Tracker")
      st.subheader("Login")
      with st.form("login form"):
            username = st.text_input("Username")
password = st.text_input("Password", type="password")
submitted = st.form_submit_button("Login")
                   user = authenticate(username, password)
if user:
                         st.session_state.authenticated = True
                         st.session_state.current_user = user
                         st.rerun()
                   else:
                        st.error("Invalid username or password")
# Staff Dashboard using Staff class methods
def staff_dashboard():
    """Render the staff dashboard with performance metrics and call handling functionality."""
      user = st.session_state.current_user
      staff = user["object"]
st.title(f"Staff Dashboard - {staff.first_name} {staff.last_name}")
         Quick links section (RS4)
      with st.expander("Quick Links"):
    col1, col2, col3 = st.columns(3)
            with col1:
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st.page_link("https://www.google.com/", label="Customer Service Guide")
      with col2:
             st.page_link("https://www.google.com/", label="Technical Support Manual")
      with col3:
            st.page_link("https://www.google.com/", label="FAQ Database")
# Workday controls (RS5
# workday controls (185)
coll, col2 = st.columns(2)
with coll:
    if not st.session_state.workday_started:
            if st.button("Start Workday"):
    staff.start_workday()
                  st.session_state.workday_started = True
st.session_state.workday_start_time = time.time()
st.success("Workday started!")
      else:
            work_time = time.time() - st.session_state.workday_start_time
st.metric("Time Elapsed", f*[int(work_time // 3600)}h {int((work_time % 3600) // 60)}m")
if st.button("End Workday"):
    total_time = staff.end_workday()
                   st.session_state.workday_started = False
                  staff_df, _ = load_staff_data()
staff_df.loc[staff_df['staff_id'] == staff.id, 'working_time_elapsed'] = total_time
staff_df.to_csv(STAFF_FILE, index=False)
                   st.success(f"Workday ended! Total time: {int(total_time // 3600)}h {int((total_time % 3600) // 60)}m")
# Call simulation (RS6 RS7)
with col2:
      if st.session state.workday started:
            id=call_id,
                               status="Incoming",
                                time_elapsed=0,
                                sat score=0
                               handler_id=0
                         new call.start time = time.time()
                         st.session_state.current_call = new_call
                         st.rerun()
             else:
                   call = st.session_state.current_call
call_duration = time.time() - call.time_elapsed
st.warning(f"Call in progress: {int(call_duration)} seconds")
                   if st.button("End Call"):
                         # Random satisfaction score between 0.5 and 1.0
sat_score = round(random.uniform(0.5, 1.0), 1)
staff.end_call(st.session_state.current_call, sat_score)
                         current_call = st.session_state.current_call
                          # Get current date/time in the correct format
                         now = datetime.datetime.now().strftime('%d/%m/%Y %H:%M')
                            Update calls CST
                         calls_df, _ = load_calls_data()
new_call_data = {
                                'call_id': current_call.id,
'status': current_call.status,
'time_elapsed': int(current_call.time_elapsed),
                                'sat_score': float(current_call.sat_score)
'handler_id': staff.id,
                                'date': now,
                                'team_id': user['team_id']
                         calls df.loc[len(calls df)] = new call data
                         calls_df.to_csv(CALLS_FILE, index=False)
                         st.session_state.current_call = None
# Performance metrics (RS1, RS3)
st.subheader("Performance Metrics")
calls_df, _ = load_calls_data()
staff_calls = calls_df[calls_df['handler_id'] == staff.id]
team_calls = calls_df[calls_df['team_id'] == user['team_id']]
if not staff_calls.empty:
      # Success rate pie chart (RS1)
successful = len(staff_calls[staff_calls['sat_score'] >= 0.8])
unsuccessful = len(staff_calls) - successful
      fig, ax = plt.subplots(1, 2, figsize=(12, 4))
      ax[0].pie([successful, unsuccessful],
                      labels=['Successful', 'Unsuccessful'],
autopct='%1.1f%%',
colors=['#4CAF50', '#F44336'])
      ax[0].set title('Your Call Success Rate')
         Satisfaction trend line chart (RS3
      # Satisfaction tiels The Charle (RS3) daily_avg = staff_calls.groupby(staff_calls['datetime'].dt.date)['sat_score'].mean().reset_index() team_daily_avg = team_calls.groupby(team_calls['datetime'].dt.date)['sat_score'].mean().reset_index()
      ax[1].plot(daily_avg['datetime'], daily_avg['sat_score'], label='Your Score')
ax[1].plot(team_daily_avg['datetime'], team_daily_avg['sat_score'], label='Team Average')
ax[1].set_title('Satisfaction Score Trend')
ax[1].set_xlabel('Date')
ax[1].set_xlabel('Date')
      ax[1].legend()
ax[1].grid(True)
      st.pyplot(fig)
  Update call history table:
# Update call history table:
if not staff_calls.empty:
   recent_calls = staff_calls.sort_values('datetime', ascending=False).head(5)
   recent_calls['duration'] = recent_calls['time_elapsed'].apply(lambda x: f"{x // 60}m {x % 60}s")
   recent_calls['status'] = recent_calls['sat_score'].apply(
   lambda x: " ... Successful" if x >= 0.8 else " Unsuccessful")
       st.dataframe(recent_calls[['datetime', 'duration', 'sat_score', 'status']].rename(columns={
             'datetime': 'Time',
'duration': 'Duration',
'sat_score': 'Satisfaction Score',
'status': 'Status'
```

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Manager Dashboard using Manager class methods
def manager dashboard():
                                      er dashboard with team overview and staff management functionality."""
       user = st.session state.current user
      manager = user["object"]
st.title(f"Manager Dashboard - {manager.first_name} {manager.last_name}")
      staff_df, staff_objects = load_staff_data()
calls_df, _ = load_calls_data()
teams_df = load_teams_data()
       manager_df, manager_objects = load_managers_data()
      team_staff = staff_df[staff_df['team_id'] == user['team_id']]
team_calls = calls_df[calls_df['team_id'] == user['team_id']]
      st.subheader("Team Overview")
           Team success rate (RM2)
      if not team_calls.empty:
            col1, col2= st.columns([2, 2]) # Adjusted relative widths
             with col1:
                      Time period selector - now properly contained within coll
                    time_period = st.selectbox(
                          "Time Period",
["All Time", "Today", "Last 7 Days", "Last 30 Days", "Last 90 Days"],
key="time_period_selector" # Added key to avoid duplicate widget issues
                   # Calculate filtered calls based on selected time period
if time_period == "Today":
                    cutoff_date = pd.to_datetime('today')
filtered_calls = team_calls[team_calls['datetime'] >= cutoff_date]
elif time_period == "Last 7 Days":
                   elif time_period == "Last 7 Days":
    cutoff_date = pd.to_datetime('today') - pd.Timedelta(days=7)
    filtered_calls = team_calls[team_calls['datetime'] >= cutoff_date]
elif time_period == "Last 30 Days":
    cutoff_date = pd.to_datetime('today') - pd.Timedelta(days=30)
    filtered_calls = team_calls[team_calls['datetime'] >= cutoff_date]
elif time_period == "Last 90 Days":
    cutoff_date = pd.to_datetime('today') - pd.Timedelta(days=90)
    filtered_calls = team_calls[team_calls['datetime'] >= cutoff_date]
else: # "All Time"
                   else: # "All Time"
filtered_calls = team_calls.copy()
                    # Now create the pie chart with filtered data
if not filtered_calls.empty:
                          filtered_successful = len(filtered_calls[filtered_calls['sat_score'] >= 0.8])
filtered_unsuccessful = len(filtered_calls) - filtered_successful
                          fig, ax = plt.subplots()
ax.pie([filtered_successful, filtered_unsuccessful],
                                     labels=['Successful', 'Unsuccessful'],
autopct=lambda p: f'{p:.1f}%' if p > 0 else '',
colors=['#4CAF50', '#F44336'],
                                     wedgeprops={'linewidth': 1, 'edgecolor': 'white'})
                          ax.set_title(f'Team Success Rate\n({time_period}: {len(filtered_calls)} calls)')
                           # centre_circle = plt.Circle((0, 0), 0.7, color='white', fc='white', linewidth=0)
                          # ax.add artist(centre circle)
                          st.pyplot(fig)
                          st.metric("Success Rate",
    f"{success_rate:.1f}%",
    f"{filtered_successful} of {len(filtered_calls)} calls")
                         st.warning(f"No call data available for {time_period.lower()}")
            with col2:
                   # Team comparison chart
st.write("**Team Comparison**")
if len(teams_df) > 1:
                          team_success = []
for _, team in teams_df.iterrows():
                                if len(team_calls = calls_df[calls_df['team_id'] == team['team_id']]
if len(team_calls) > 0:
    success_rate = len(team_calls[team_calls['sat_score'] >= 0.8]) / len(team_calls)
                                       team_success.append({
    'Team': '.'.join(re.findall(r'\b(\w)\w*\b', team['team_name'])) + '.',
    'Success Rate': success_rate
                                       })
                                 if not team_staff.empty and not team_calls.empty:
                                       performance_data = []
for _, staff in team_staff.iterrows():
                                              _, staff in team_staff.rteflows()'
staff_calls = calls_df[calls_df['handler_id'] == staff['staff_id']]
if len(staff_calls) > 0:
    success_rate = len(staff_calls[staff_calls['sat_score'] >= 0.8]) / len(staff_calls)
                                                   success_rate = len(staff_caffs(affs(saf_score)) >=
performance_data_append({
    'Staff ID': staff['staff_id'],
    'Name': f*{staff['first_name']} {staff['last_name']}*,
    'Calls Taken': staff('calls_taken'),
    'Success Rate': success_rate,
}
                                                           'Avg Satisfaction': staff['avg sat score']
                                                    })
                          if team success:
                                 comparison_df = pd.DataFrame(team_success)
fig, ax = plt.subplots()
                                sns.barplot(data-comparison_df, x='Team', y='Success Rate', ax=ax) ax.set_title('Team Comparison') ax.set_ylim(0, 1)
                                st.pyplot(fig)
       # Top/worst performers (RM4)
      st.subheader("Performance Highlights")
       if performance_data:
            perf_df = pd.DataFrame(performance_data)
perf_df = perf_df.sort_values(['Success Rate', 'Calls Taken', 'Avg Satisfaction'], ascending=False)
            col1, col2 = st.columns(2)
                   st.write("Top Performers")
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}), hide\_index=True)

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# Apply green background to top performers
           st.dataframe(
                perf_df.head(3).style.map(
    lambda x: 'background-color: #95b36b', # Mint green pastel
                      subset=pd.IndexSlice[:, :] # Apply to all cells
                hide index=True
     with col2:
           st.write("Need Improvement")
           # Apply red background to bottom performers and sort by Success Rate st.dataframe(
                perf_df.tail(3)[::-1].style.map(
   lambda x: 'background-color: #fab6b6', # Pastel red
   subset=pd.IndexSlice[:, :] # Apply to all cells
                hide_index=True
     st.info("No performance data available yet")
# Staff management section
st.subheader("Staff Management")
tab1, tab2, tab3, tab4 = st.tabs(["View Staff", "Add Staff", "Edit Staff", "Remove Staff"])
        View staff details (RM1, RM9)
     selected_staff = st.selectbox(
    "Select Staff Member",
           \texttt{team\_staff.apply(lambda x: } \texttt{f"}\{\texttt{x['staff\_id']}\} - \{\texttt{x['first\_name']}\} \ \{\texttt{x['last\_name']}\}", \ \texttt{axis=1}\}
     if selected_staff:
           staff_id = int(selected_staff.split(" - ")[0])
staff_details = team_staff[team_staff['staff_id'] == staff_id].iloc[0]
           # Staff call history
           st.dataframe(recent_calls[['datetime', 'duration', 'sat_score', 'status']].rename(columns={
                      'datetime': 'Time',
'duration': 'Duration'
                       'sat_score': 'Satisfaction Score',
'status': 'Status'
                }), hide_index=True)
with tab2:
         Add staff (RM6)
      with st.form("add_staff_form"):
    st.write("Add New Staff Member")
           st.write("Add New Staff Member")
staff_id = st.number_input("Staff ID", min_value=1, step=1)
first_name = st.text_input("First Name")
last_name = st.text_input("Last Name")
target_calls = st.number_input("Target Successful Calls", min_value=1, value=10)
           submitted = st.form submit button("Add Staff")
                if staff_id in staff_df['staff_id'].values:
                      st.error("Staff ID already exists")
                      # Create new Staff object
                      new_staff = Staff(
                           id=staff_id,
first_name=first_name,
                           last_name=last_name,
manager_id=manager.id,
                           manager_iu=manager.iu,
calls_taken=0,
successful_calls=0,
failed_calls=0,
target_successful_calls=target_calls,
working_time_elapsed=0,
                           avg sat score=0,
                           status='Free
                      # Add to CSV
                      # Add to Csv
new_row = {
    'staff_id': staff_id,
    'first_name': first_name,
    'last_name': last_name,
    'manager_id': manager.id,
    'calls_taken': 0,
    'successful_calls': 0,
    'field_calls': 0,
                            'failed_calls': 0,
'target_successful_calls': target_calls,
                           'working_time_elapsed': 0,
'avg_sat_score': 0,
'status': 'Free',
'team_id': user['team_id']
                      staff_df.loc[len(staff_df)] = new_row
                      staff_df.to_csv(STAFF_FILE, index=False)
                      manager.staff_list.append(staff_id)
                      # Update manager CSV
                      manager_df.loc(manager_df['manager_id'] == manager.id, 'staff_list'] = str(manager.staff_list)
manager_df.to_csv(MANAGERS_FILE, index=False)
                      st.success("Staff member added successfully!")
                      st.rerun()
with tab3:
     # Edit staff (RM8)
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staff_to_edit = st.selectbox(
                                                to Edit
                  team_staff.apply(lambda x: f''\{x['staff_id']\} - \{x['first_name']\} \{x['last_name']\}'', axis=1),
                  key="edit_select
            if staff to edit:
                  staff_id = int(staff_to_edit.split(" - ")[0])
staff_details = team_staff[team_staff['staff_id'] == staff_id].iloc[0]
                 min value=1.
                             value=int(staff_details['target_successful_calls']))
                       new_status = st.selectbox(
                             status = st.sercccon,
"Status",
['Free', 'On Call', 'Lunch', 'Out of Office'],
index=['Free', 'On Call', 'Lunch', 'Out of Office'].index(staff_details['status']))
                        submitted = st.form_submit_button("Update Staff")
                       if submitted:
                             submitted:
staff_df.loc[staff_df['staff_id'] == staff_id, 'first_name'] = new_first
staff_df.loc[staff_df['staff_id'] == staff_id, 'last_name'] = new_last
staff_df.loc[staff_df['staff_id'] == staff_id, 'target_successful_calls'] = new_target
staff_df.loc[staff_df['staff_id'] == staff_id, 'status'] = new_status
staff_df.to_csv(STAFF_FILE, index=False)
                             st.success("Staff details updated successfully!")
                             st.rerun()
      with tab4:
           # Remove staff (RM7)
staff_to_remove = st.selectbox(
   "Select Staff Member to Remove",
   team_staff.apply(lambda x: f"{x['staff_id']} - {x['first_name']} {x['last_name']}", axis=1),
                 key="remove_select
           if staff to remove:
                 staff_id = int(staff_to_remove.split(" - ")[0])
                 if st.button("Remove Staff"):
    if staff_id == manager.id:
        st.error("You cannot remove yourself")
                       else:
# Remove from CSV
                             staff df = staff df[staff df['staff id'] != staff id]
                             staff_df.to_csv(STAFF_FILE, index=False)
                             # Update manager's staff list
if staff_id in manager.staff_list:
    manager.staff_list.remove(staff_id)
                             st.success("Staff member removed successfully!")
                             st.rerun()
   Main app
def main():
      initialize_files()
      if not st.session_state.authenticated:
            login_page()
            if st.session_state.current_user['role'] == "manager":
                 manager_dashboard()
            else:
                 staff_dashboard()
            # Logout button
st.sidebar.title("Account")
            if st.sidebar.button("Logout"):
                 st.session_state.authenticated = False
                 st.session_state.current_user = None
st.session_state.current_call = None
st.session_state.workday_started = False
st_rerur()
                 st.rerun()
if __name__ == "__main__":
    main()
```