KING ABDULAZIZ UNIVERSITY - FACULTY OF ENGINEERING - DEPARTMENT OF INDUSTRIAL ENGINEERING

Computer Applications in Industrial Engg-1
Employee Reward System Report
IE (322)

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Introduction

In modern workplaces, tracking employee's attendance and behavior and encouraging them is critical for productivity management. Common tracking often lacks motivational elements. This project addresses this problem by producing an employee reward system that records employees' behavior and encourages them through points that could be earned by good behavior.

Problem definition

The challenges in current systems.

- Lack of motivational elements
- Manual tracking
- No reward for good behavior
- No positive interactions

Project Objective

- Develop user-friendly application that:
- Motivate employees by rewarding
- Auto track attendance and productivity
- Hard work is rewarded
- Positive interaction by rewarding instead of penalty

Solution

This project is a GUI-based Employee Reward System that allows new users to register and existing users to log in using a username and password all within defined working hours (9:00 AM to 5:00 PM) and workdays (Sunday to Thursday).

The system tracks employee behavior by awarding or deducting points based on their login activity:

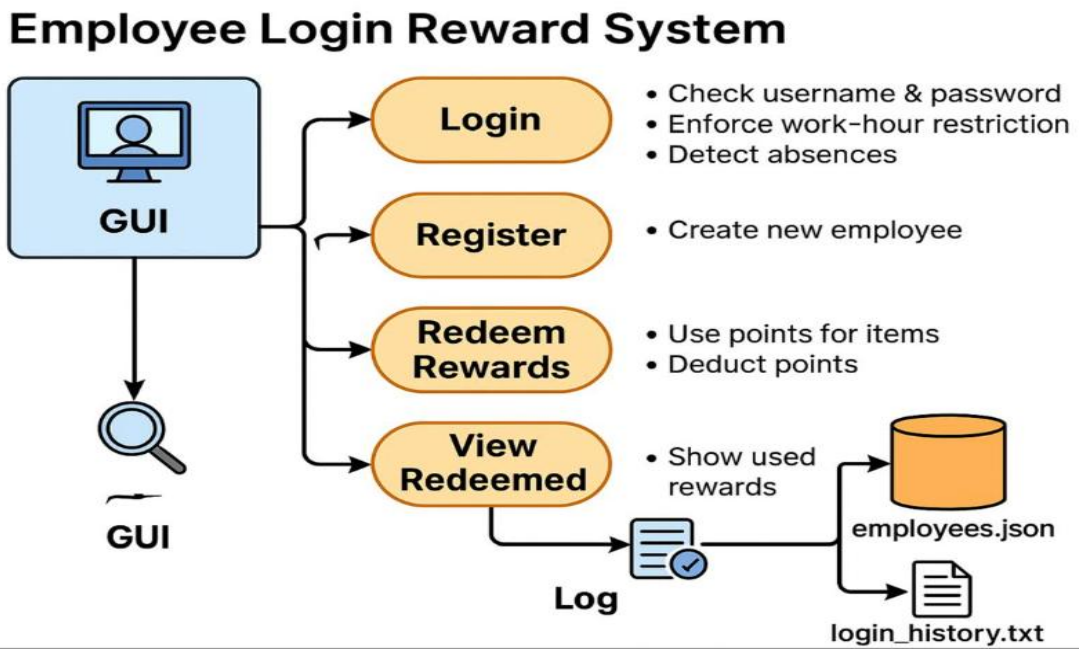
- On-time login (7:00–9:30 AM) grants +5 points
- Late login (after 9:30 AM) deducts 5 points
- Missing a workday without login results in a 10-point penalty
- Points are displayed and updated in real-time on the user interface after every action. Employees can accumulate points for good attendance or lose points due to lateness or absence.

The collected points can be redeemed for various workplace rewards:

- Coffee – 10 points
- Remove a late mark – 20 points
- Remote workday – 30 points
- Extra off day – 50 points

All data, including users' credentials, login history, point balance, and redeemed rewards, are securely saved in a local JSON file and can be retrieved on future sessions. The program is built using Python's tkinter for GUI, datetime for time tracking, and json for persistent storage. It provides a complete employee motivation tool that encourages punctuality and consistent attendance while offering flexibility and incentives

Figure: Project Flow Chart



System Architecture & Functionality Discussion

1. Imported Libraries

- **tkinter:** The core GUI (Graphical User Interface) library used to create buttons, labels, input fields, and windows. It's imported as tk, and additional components like messagebox (for alerts) and ttk (for the styled ComboBox) are used.
- **datetime, timedelta, date:** These functions handle current dates, times, and time calculations. They are essential for detecting punctuality, absences, and enforcing working hours.
- **json:** Used to store and load employee data in a structured, readable format (employees.json). It keeps login history and reward data persistent between sessions
- **os:** Helps check if the data file (employees.json) already exists before attempting to load or write it.

2. Class: Employee

This class models each employee and holds:

- **username:** the employee's login name
- **password:** used to authenticate login.
- **points:** a reward score based on punctuality and penalties.
- **redeemed:** a list of rewards the employee has redeemed.
- **last_login:** the date of the last successful login to prevent multiple point awards on the same day.

to_dict() Method:

This function converts an Employee object to a Python dictionary — enabling saving the object in a JSON format

3. Functions

load_employees()

- Checks if the data file exists.
- If yes, reads the file and converts the stored data into Employee objects.

save_employees()

- Converts all employee data back to dictionaries and saves them to employees.json.

log_login(username, status)

- Appends a line to login_history.txt whenever an employee attempts to log in, with timestamps and success/failure status

detect_absences(employee)

- Compares the employee's last login with today.
- Calculates how many weekdays were missed and deducts 10 points per day from the total score.

login()

Handles:

- Validating credentials.
- Blocking login during weekends (Friday and Saturday) unless TEST_MODE is enabled.
- Enforcing login time between 9:00 AM and 5:00 PM.
- Rewarding punctual login (+5 points between 7:00–9:30 AM).
- Penalizing late login (-5 points).
- Preventing multiple point gains in the same day.

register()

- Registers a new employee with username and password.
- Ensures the username is unique and not blank.
- Can be restricted by time and day depending on work policy.

redeem()

- Allows a logged-in employee to select a reward (coffee, remote day, etc.).
- Deducts the corresponding points from the account.
- Adds the reward to the employee's redeemed history.

view_redeemed()

- Displays a message box showing all the rewards an employee has redeemed.

update_points()

- Updates the points label on the GUI after login or redeem.

4. GUI Logic

The GUI is structured using tkinter:

- Inputs: Username and Password fields.
- Buttons: Login, Register, Redeem Reward, View Redeemed.
- Display Elements: Labels for status messages and current points.
- Combobox: For selecting reward types dynamically.

All user interactions (login, redeem, etc.) are routed through button actions to the corresponding functions.

5. Test Mode Switch (TEST_MODE)

- When set to True, this allows developers/instructors to bypass work-hour and weekend restrictions.
- When set to False (production), only valid logins between 9 AM–5 PM on Sunday– Thursday are allowed.

This switch is helpful for debugging, testing, and demonstrating functionality outside allowed times.

6. File System Used

- employees.json: Stores all employee data, including credentials, points, last login, and reward history.
- login_history.txt: Logs each login attempt for auditing and transparency.

Conclusion

The employee reward system provides effective solutions for tracking attendance and encouraging productivity in the workplace environment. By combining automated reward systems with work environment, it transforms the workplace from routine into fun and engaging and motivational environment.