



ENGM 4620 – Python for Engineers

Group Project #1: The Development of a
Practical Python Package

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Problem Identification

In today's competitive job market, individuals often find themselves juggling numerous job applications simultaneously, leading to potential confusion, missed deadlines, and disorganization. Without a centralized system to manage applications, candidates may struggle to keep track of important details such as application status, interview dates, contact information, and additional details. This lack of organization can hinder chances of securing employment opportunities efficiently. Therefore, there is a practical need for a user-friendly job application tracker tool that can streamline the application process, increase organization, and enhance the prospects of job seekers by providing them with a structured platform to manage their job applications effectively.

Existing Solutions

1. LinkedIn Job Tracker

Integrated within the LinkedIn platform, users can save jobs, track applications submitted through LinkedIn, and receive notifications and updates.

Features: Easy integration with LinkedIn's job search functionalities, notifications for application deadlines, and recommendations based on saved and applied jobs.

Benefits: Streamlines the job search process for LinkedIn users, leveraging the platform's extensive network and job listings.

Drawback: Users may want to apply to jobs using other job sites, not exclusively LinkedIn.

2. Excel

Users can manually input their applications in an Excel sheet. Personally, this is the method I have used in the past. However, it is tedious to organize, and it only has basic features which will not compare to the next development iteration of this project.

3. Notion

Overview: Notion is a general productivity and organization tool and many users leverage its customizable templates to create personalized job application trackers.

Features: Customizable templates, databases for tracking applications, task lists, calendar integration, and collaborative features.

Benefits: Flexibility to design a job application tracker that fits individual needs, combined with Notion's robust note-taking and organization functionalities.

Project Concept

This project aims to develop a comprehensive and user-friendly Python package for job application tracking. This package will provide job seekers with a tool to easily and efficiently manage their job application process. Users will be able to input and organize details such as:

- Company name
- Position
- Date Applied

- Contact Information (i.e., recruiter email)
- Application Status (applied, interview scheduled, offer extended, rejected, withdrawn)
- Interview date (if application status is interview scheduled)
- Job Posting URL
- Additional Details

The goal of this project is to provide job seekers with a centralized platform that enhances organization, reduces stress, and increases the likelihood of securing employment opportunities.

Project Features

Below is a list of the project features:

- Add a job application.
- Update a job application.
- Delete a job application.
- Search job applications by company.
- List all companies applied to.
- Analytics: provides users with insights into their job application activity such as:
 - Total amount of job applications
 - Status Count: Breakdown of job applications by status categories within a specified time period. It gives users an overview of their overall job search activity.
 - Applied: Number of applications that have been submitted but not yet progressed to the next stage.
 - Interview Scheduled: Number of applications where interviews have been scheduled.
 - Offer Extended: Number of applications where a job offer has been extended to the user.
 - Rejected: Number of applications that have been rejected by the employer.
 - Withdrawn: Number of applications that the user has withdrawn from consideration.
 - Application to Interview Rate: Percentage of applications that have progressed to the interview stage. This metric helps users evaluate the effectiveness of their job search strategies and identify areas for improvement.
 - Application to Offer Rate: Percentage of applications that have resulted in job offers.
- Exit the program.
- The data saves to a CSV file in which the user can open and edit on their own accord.

Error Handling

Throughout your Job Application Tracker program, several error handling and input validation mechanisms have been implemented to ensure robustness and user-friendliness. Here's a detailed overview of these mechanisms:

1. Validation for Empty Inputs for Company Name and Position

Before proceeding to collect further details for an application, the program checks if the user has entered a company name and a position. If either of these fields is left blank, the program prompts the user again for the input, ensuring that these essential details are collected before proceeding.

Implementation: This is achieved through while loops that repeatedly ask for input until a non-empty string is provided for both the company name and position.

2. Date Input Validation for Date Applied and Interview Date

The program validates that the dates entered for "Date Applied" and "Interview Date" follow the correct YYYY-MM-DD format and are logical dates (e.g., not in the past for "Interview Date").

Implementation: This is achieved using the `datetime.strptime` method to parse the date string. If parsing fails (due to incorrect format) or the date is found to be in the past (for "Interview Date"), the user is prompted to re-enter the date.

3. Future Date Validation for Interview Date

Beyond format validation, the program specifically checks that the "Interview Date" is not set in the past, ensuring that only future or current dates are accepted for interviews.

Implementation: After parsing the date, the program compares it to the current date. If the interview date is in the past, the user is prompted to enter a new date.

4. Handling Non-Existent Applications for Update and Delete Operations

When attempting to update or delete an application, the program first checks if the specified application exists. If not, it informs the user that no application was found for the given company and position.

Implementation: This is done by searching the applications data structure for the specified company and position. If no matching application is found, an error message is displayed.

5. Robust CSV File Reading and Writing

The program handles potential issues with reading from or writing to the CSV file including handling the case where the CSV file does not exist when attempting to load applications at startup.

Implementation: The program uses a try-except block to catch a `FileNotFoundError` when attempting to load applications from the CSV file. If the file is not found, it initializes the application data structure without crashing and notifies the user that no existing job applications file was found.

6. Case-insensitive Search

A common challenge users face when interacting with data entry and retrieval systems is the need for exact matches, which can be problematic with case sensitivity. The Company Name and Position fields are implemented as case-insensitive to allow users to search for applications without having to worry about typing the correct case for an exact match.

Implementation: Convert all user-entered company names and positions to a consistent case (in this implementation, we chose lowercase) before storing the data.

Future Development

Web App Implementation

Implementing a web application would be beneficial in terms of increased accessibility, improved user experience, real-time updates and notifications (i.e., interview reminders), a proper database, login and account capabilities.

Schedule Calendar Events and Tasks

The ability to schedule calendar events and tasks will increase user organization, time management, enhanced productivity, integration of the project with external calendars, and interview reminders.

Further Job Details

Improve utility of the Job Application Tracker with more input options such as job description, salary information, location, benefits package, interview feedback, etc. These were not implemented in this iteration as this current tracker was made to be simplified. Once a user interface is implemented, it will be easier for the user to maintain more information such as those listed.

Customizable Settings

The user may be able to customize their settings such as auto-deleting applications after X amount of time, notification preferences (i.e., notifications via email), and theme and display options (light vs dark).

Robust Search and Filter

Currently, the search functionality is limited as a simplified tracker. In a future iteration, the search can be applicable to all input fields, and a filter can be applied.

Conclusion

This Job Application Tracker was developed to be simple and intuitive, with the user's needs taken heavily into account. It is a practical application which will help job seekers organize and manage their job applications in one centralized system. There's a lot of potential in growth for this Job Application Tracker and with further development, this is an application will help job seekers thrive in their job search.