A REPORT
ON
Robotic Process Automation
Grade Confirmation Email Bot

BY

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AT
SilverTouch Technologies Ltd, Ahmedabad
A Practice School-I Station of
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ABSTRACT

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Project Areas: Development of Software Bots using Automation Anywhere

This is a report for the project done at SilverTouch, for Practice School-I of BITS Pilani. Automation Anywhere is a non-coding tool to create software bots that can do the work faster and more efficiently than humans.
Bot processing is a very emerging and new-age industry. It is a hack to improve exponentially all the everyday tasks that require labour. Time, Money & Labour is reduced significantly. Errors are minimised or nullified, and folds improve efficiency and correctness.

Automation Anywhere is the tool for our bot demonstration in the report. It is the most popular software for Robotic Process Automation. We will be using email and excel packages to showcase our bot. Credentials & Lockers will also be used while working with email operations.
We will highlight the advantage of using RPA in Automation Anywhere and compare it with standard scenarios when the same task is done by employees manually.

Our bot will display a grade report of a particular student as an attachment in the mail. The body will constitute his name, grade remark and pass/fail status as variables and the rest as static content.

Signature of Students

Jatin Pratham

Date: 28th June, 2022

Preface

Silver Touch is a world-leading and internationally recognised IT Solutions provider and is currently the leading Digital Transformation & Emerging Technologies to assist customers worldwide. Silver Touch, since its inception in 1995, has provided customers and businesses with its new IT Solutions. Teams of experts from all walks of life applied science and worked together to bring the organisation's most brilliant expertise. An expert in processing business functions while transforming everything into a digital and cyber matrix. It runs in line with technological trends. Silver Touch offers solutions especially built to aid the unique characteristics of that specific industry.

They have the highest quality standard certification in the industry:-

- CMMi Level 5 Quality Standards
- ISO 27001 Information Security Standards
- ISO 20000 Service Delivery
- ISO 9001 Quality Standards

Verticals Served:-

1. Internet & Software
2. Pharmaceuticals & Healthcare
3. Manufacturing
4. Textile
5. Omni Channel Experience
6. Government / Public Sector

Acknowledgements

We find ourselves in great pleasure while penning down these lines to express our sincere thanks to those who have helped us immensely throughout our projects until now.

We are much obliged to the **Birla Institute of Technology and Science, Pilani** staff for conducting the Practice School program for the industry exposure and experience, which gives us a chance to work on this project.

Our special thanks to **Dr Pratik N Seth**, PS instructor at BITS Pilani, for his constant guidance and supervision and for providing beneficial suggestions on the project.

My immense gratitude to **Mrs Syamala Sharma & Mr Devendra Singh**, Mentors at SilverTouch, for guiding us towards the structure and design of the project as well as providing us with the necessary data and details. I am much obliged to the staff of SilverTouch for conducting various programs for industry exposure and giving a platform for the project.
This report was written as a part of PS-1 project on Automated Emails by Software bots using Automation Anywhere under **Mr Devendra Singh.**

The report consists of a review of the current understanding of Automation Anywhere, Emails & Excel.

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Introduction

Manual workforce is hard to maintain in today's digital world. We adapt to automation and machine work as we move on to further years and a strong upcoming digital transformation. It has numerous advantages over traditional labour; Time, money, efficiency, error handling, durability, and work years.

One of the most tedious and essential processes is emailing. In any organisation, internal communication is a must to uphold progress. Emails are the primary way to transact information from one employee to another, even on multiple hierarchical levels. In such scenarios, one may find himself/herself emailing hundreds of similar content with slight changes in personal information. This drains the person physically and mentally, which is a significant problem for the company.

The project will demonstrate emailing students of any particular organisation their grade reports. Variables are shown in {} in the following script. The email will include their grade report as an attachment.

Email Body:-

Greetings {Name},

You have successfully attempted 'xyz examination 2022'
Grade: {Grade}
Status: {pass or fail}
Please find your grade report attached in the mail.
Thank you and Good luck for your future

Regards,
Jatin
Pratham

Assumptions made in the report include that we have a list of all the emails of the student and everyone uses google mail. Mail will be sent through outlook. We are using sample grade reports, and it is not actual data for an actual examination in any real organisation.

Limitations include strict security for Gmail to Gmail bot processing. Gmail has additional security features that need to be altered for using source mail with @gmail.com.

Digital Transformation

Digital transformation is the adoption of an organisation. Common goals for its implementation are to improve efficiency, value or innovation.

Silver Touch Technologies Ltd. being an IT services provider excels in digital transformation for the future of the company and better management of its assets.

Types:-

1. **Process Transformation -** Companies can revise internal processes to lower costs, improve quality and reduce cycle times.
2. **Business Model Transformation -** Business model transformation fundamentally aims to change how companies deliver value for customers.
3. **Domain Transformation -** Organisations typically adopt new technologies to redefine their products and services.
4. **Cultural/Organisational Transformation -** Embracing a digital-first culture enables organisations to adopt agile workflows, develop a bias toward testing and learning, and support decentralised decision-making.

Benefits of Digital Transformation:-

1. Enhanced data collection
2. Stronger resource management
3. Data-driven customer insights
4. A better customer experience
5. Encourages digital culture (with improved collaboration)
6. Increased profits
7. Increased agility
8. Improved productivity

Example - Attendance in any organisation was done using pen and paper decades ago. Soon we entered buttons and switches for attendance. Then came software such as an ID scanner using QR Code. Now we have biometrics, facial recognition & speech recognition.

Our Bot also inculcates the Digital Transformation and, similarly, automates the whole process and showcases all the eight benefits mentioned above.

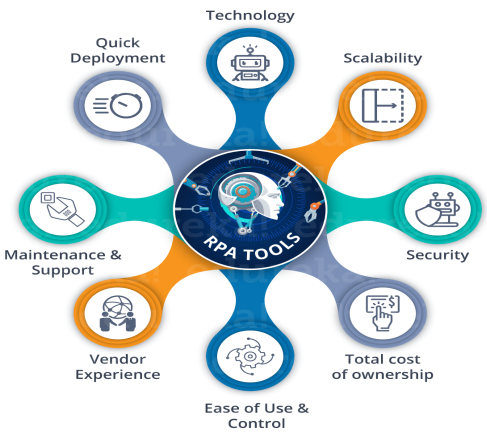
Robotic Process Automation

Robotic process automation (RPA) is a type of automated business process technology based on analog software robots, artificial intelligence (AI), or digital staff. They are sometimes called software robots (not to be confused with robotic software).

For automated workflow automation tools, a software developer generates a task list to automatically perform a task with the interface in the back-end system using an internal application interface (APIs) or a dedicated writing language. In contrast, RPA systems develop a list of actions by viewing the user performing that function in the application interface (GUI), then performing the default by repeating those tasks directly in the GUI. This may reduce the use of automated applications for products that may not include APIs for this purpose.

RPA tools have strong technical similarities and tools for testing user interfaces. These tools also automatically integrate with the GUI and often do so by repeating a set of user actions performed by the user. RPA tools differ from such systems because they allow data to be processed between and within multiple applications, for example, to receive an invoice email (similar to our bot, too), extract data, and type it into a bookstore.

The Future of RPA is smarter Automations. The next step, which some organisations are already taking, is to blend attended automation and RPA with artificial intelligence (AI) and machine learning tools. Variously known as intelligent automation, intelligent process automation and cognitive RPA, this class of solutions enables enterprises to automate more complex, less rule-based tasks. Softwares such as Automation Anywhere, Blue Prism, Ui Path etc.. support RPA and are used worldwide for bot processing.



Automation Anywhere

Automation Anywhere is a Robotic Process Automation tool that allows organisations to automate business processes from start to finish. The prime factor of Automation Anywhere, which makes it different from others and easy to use, is that it requires little to no knowledge of programming languages to create bots. The user interface (UI) of Automation Anywhere is straightforward and easy to understand, even for non-programming people. Automation Anywhere allows us to create three types of bots which are:

1. Task Bot
2. Meta Bot
3. IQ Bot

All the bots made in Automation Anywhere are accessible from the Control Room.

Automation Anywhere also provides extra features like:

1. Optical Character Recognition (OCR)
2. Bot Insight
3. Trigger Manager
4. BOT Store
5. Automation People Community
6. Automation University
7. Automation Documentation

Automation Anywhere is a high-performance tool that allows organisations to implement RPA technology into their existing processes.

Task Bot

Use the *Run, Pause, and Stop* actions in the Task Bot package to manage running one or more child bots from a parent bot or with third-party software using an API.

1. Run - Runs the selected task multiple times for a specified number of times or several hours. The task can be repeated until the user chooses to stop it.
2. Pause - Temporarily pauses the running bot. A Resume button appears when the bot reaches the Pause action during run time. We can click Resume for the bot to continue to the next action.
3. Stop - Stops the running bot. For example, use the Stop action to terminate the bot if a condition is met, such as if the bot encounters a file larger than 100 MB.

Meta Bot

MetaBots are highly reusable, created once, and used everywhere bots. MetaBots can be shared across an enterprise or uploaded to the Bot Store to make them available to the entire Automation Anywhere community.

Users with the correct roles, permissions, and licensing can create, save, and share MetaBots. As both creators and consumers, bot developers create MetaBots for reuse by other bot developers within an enterprise or share MetaBots across the entire Automation Anywhere community by uploading MetaBots to the Bot Store.

Bot developers capture and save assets, then develop navigational logic to produce reusable MetaBots.

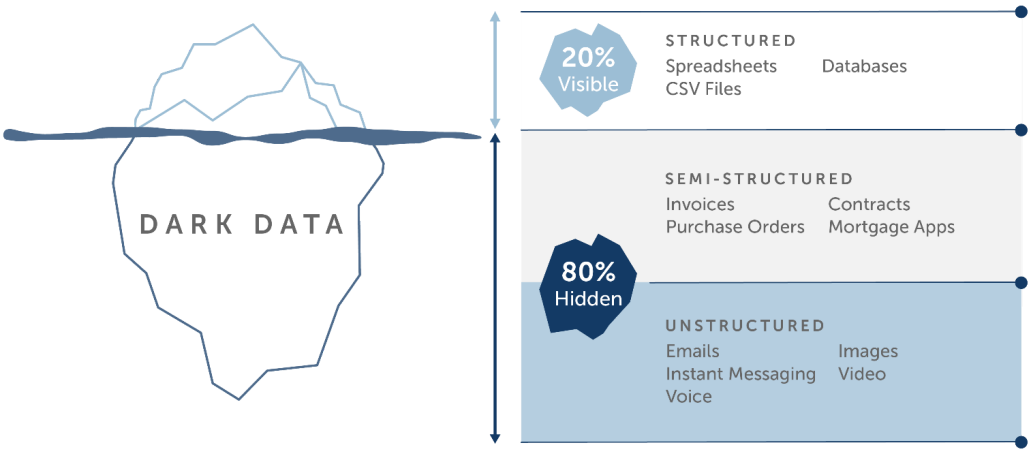
Assets - Application screens and DLLs make up the Assets bot developers use to define and pre-configure for the use case of a target application.

Logic - Logic is the navigational workflow wrapped around components, commands, functions, and DLLs within a TaskBot or MetaBot. Logic is created, edited, and saved from the Workbench.

IQ Bot

IQ Bot provides cognitive (intelligent) automation to uncover and transform essential but less structured data to automate business processes quickly and efficiently, simultaneously reducing human error.

Cognitive automation processes semi-structured and unstructured data and converts it into structured data used by Robotic Process Automation (RPA) bots for end-to-end automation.



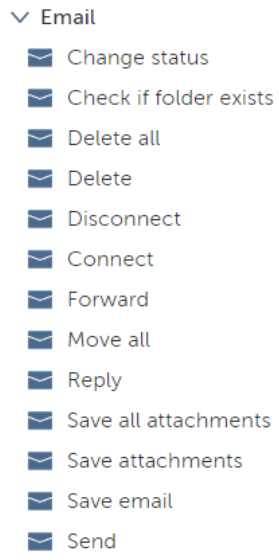
Email Package

The **Email** package contains actions to automate email-related tasks through Exchange Web Services (EWS), Microsoft Outlook, and other email servers. We can use these actions for sending, receiving, and modifying messages, folders, and the status of messages. It supports EWS, POP3, SMTP, and IMAP protocols.

It helps in performing the following tasks:-

- Manage and organise email messages and folders.
- Download attachments from emails to specific folders on devices.
- Extract data from emails to variables to use as extracted data in other applications.

These are the various actions provided in the email package:-



Emails are retrieved based on the sequence of the folders listed in the inbox field. Within each folder, emails are retrieved based on the received date and time in the last-in, first-out (LIFO) order.

One must perform the following steps while using the email package.

1. Establish a connection with an email server using the Connect action.

   While establishing the connection, specify the details and session name of the email server. Use this same session name for the other actions.
2. Use the actions to automate a task.
3. After we have automated all the email-related tasks, terminate the connection to the mail server using the Disconnect action.

A detailed explanation of each step is provided in Automation Anywhere documentation.

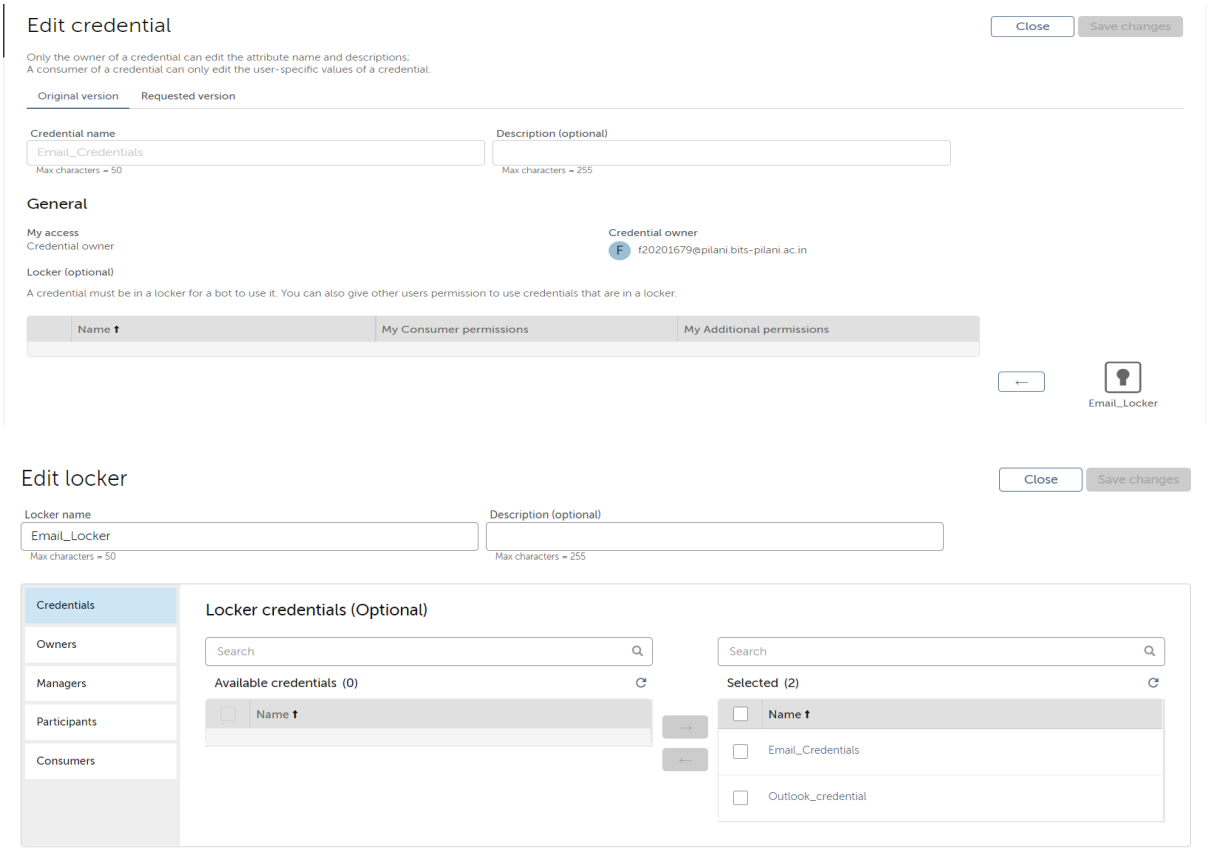
Credentials & Lockers

The Credential Vault securely stores sensitive information such as passwords, account numbers, and social security numbers in credentials and lockers for use in automation tasks. It facilitates role-based access for users of a Control Room and ensures that sensitive values are not stored in bots or on devices.

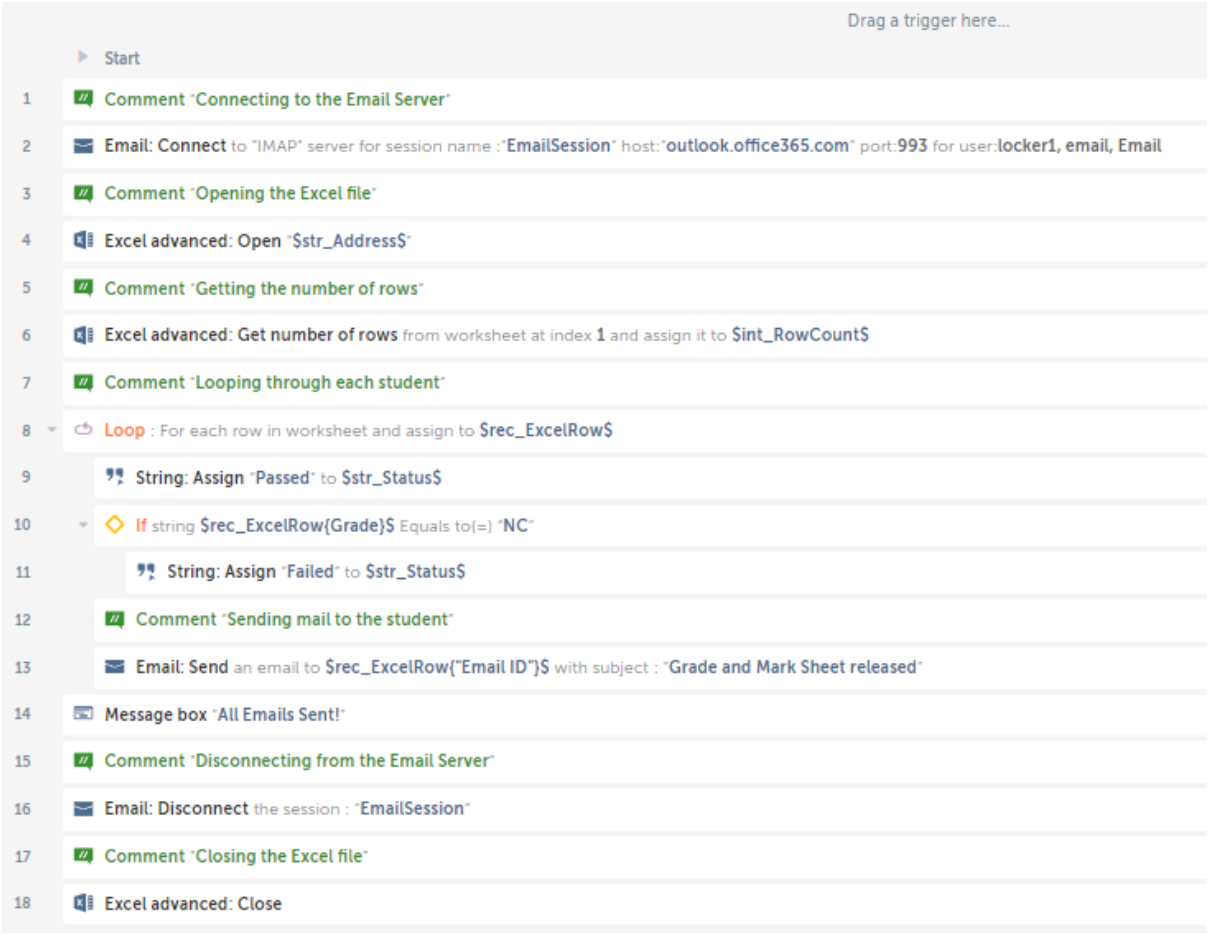
A locker specifies which users can view, modify, or access. For example, a human resources (HR) locker can hold Email, Database, and Training website credentials and allow only specific employees of the HR department to use the credentials in their bots.

Apart from providing a secure and centralised location for storing credentials, using the Credential Vault also:

- Minimises credential fraud.
- Provides an environment to enable improved security.
- Enables businesses to adhere to the processes and credential management compliance standards.
- Offers increased automation opportunities with secure data applications.

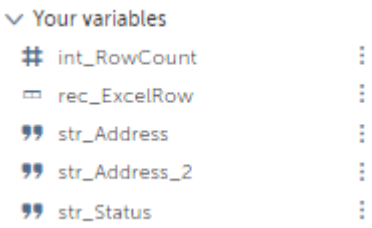


About the Project - Layout



Comments are used for each line to showcase a clear understanding of the code for the foreign reader.

Variables Used.



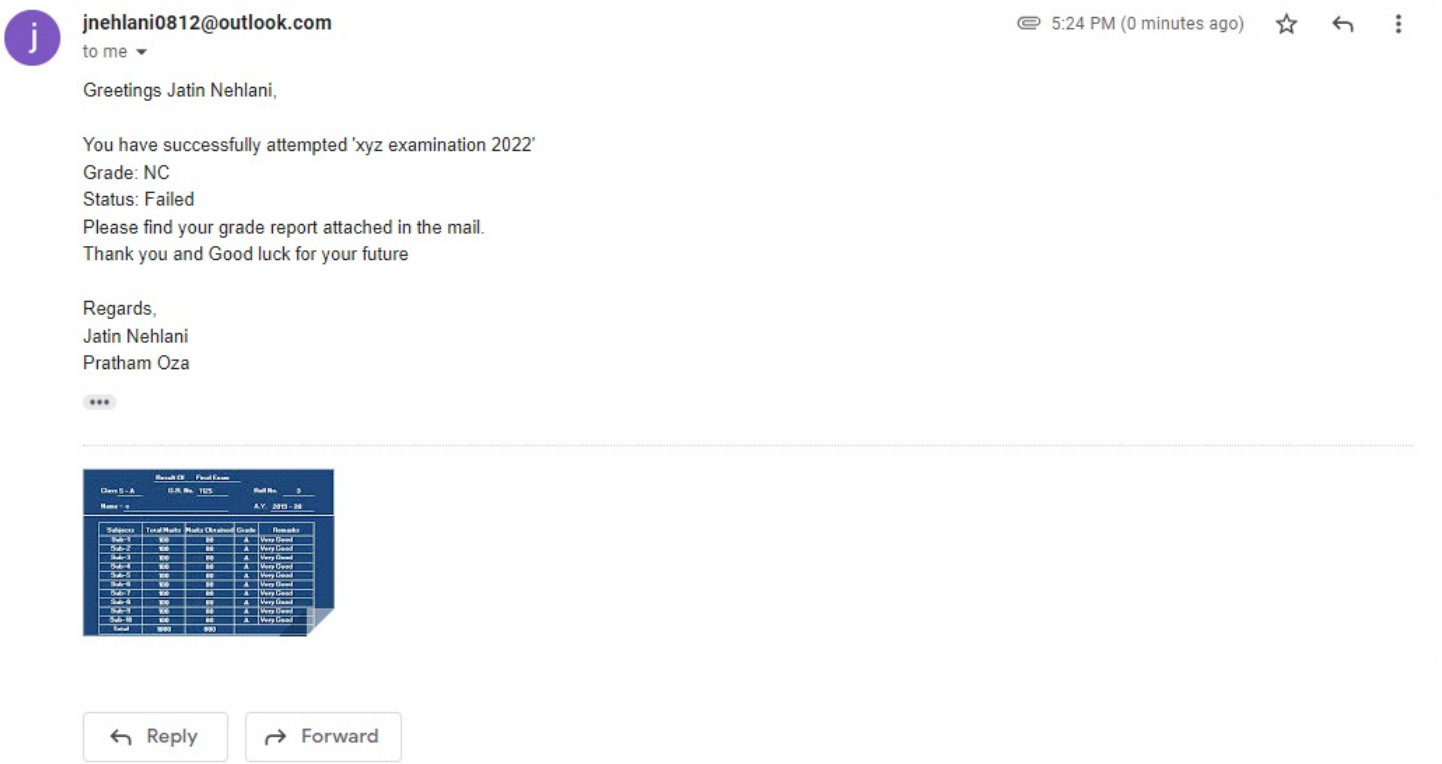
‘#’ shows the number variable

‘ ” ’ shows string variable

rec_ExcelRow shows the record variable

Testing

This is a sample mail after running the bot sent to a particular student with:-



Name: Jatin Nehlani

Grade: NC

Status: Failed

You can see the grade report present as an attachment in the same.

Other content is static and the same for everyone else.

Working

1. From *line 2*, the bot starts by connecting to the Email server using the host, port and the credentials stored in the credential locker. For this project, we used the outlook server as the host; the port we have used is 993, and we used the IMAP protocol.
2. In *line 4*, the bot accesses the Student data like Student ID, Student Name, Email ID and the grade they got stored in the excel file on the desktop using the Excel Advanced command. Variable used str_Address.
3. In line 6, the bot got the number of rows from the excel file with the index 1, and we saved it to the variable int_RowCount.
4. In *line 8*, the bot iterates through all the rows of the excel file and for each row, it stores the whole row in a record to perform actions on it.
5. In *line 9*, the bot assigned value ‘passed’ into a string variable str_status.
6. In *line 10*, the bot checks the student's status (Passed/Failed) as per their grade. If the student has a grade equal to NC, his status is changed to ‘Failed’ and stored into the same variable str_Address.
7. In *line 13*, the bot sends the Email to the Email ID of the particular student, writing down the student's grade and status and attaching the student's grade sheet from the folder of all the grade sheets.
8. In *line 14*, the bot sends a confirmation message in the message box that all emails have been sent.
9. In *line 16*, We are disconnecting the email session.
10. In *line 18*, We closed the excel file.

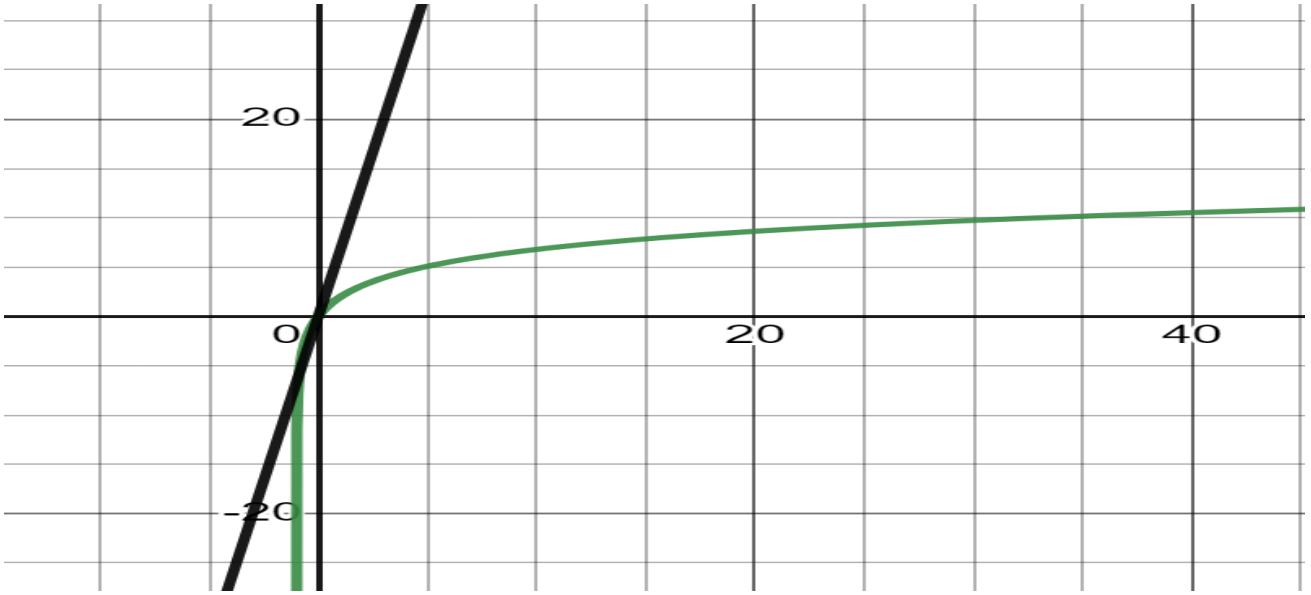
We use Credentials & Lockers to safeguard the list of students with their emails and passwords. Only the person with access to the locker (Owner) can update it.

Analysis

This bot has made life so much easier; now, a person doesn't have to sit for hours writing emails to every student and to attach the grade sheet manually; it's a very time-consuming task for a human. For example, approximately 1000 students enrol in our college every year, so if a single person has to type emails and attach the grade sheet (Let's assume it takes 2 min per mail), then it will take a very long time to execute the whole work (Approximately 33.4 hours). The chances of error are pretty high.

Although now, the person just has to run the bot, this bot will automatically send the mail to the respective students and attach the grade sheet. The efficiency of the bot is way more than a human. Email bot may take approximately 1.5 hours.

The grade sheets can be password protected or with encrypted file names for enhanced privacy and security reasons.



The green line represents manual labour work & Black line represents Email Bot.

Y-axis depicts no. of emails (in hundreds)

X-axis depicts no. of hours

Assumption, Green line —> Y = klog(x+1), where k = 10/33.3

Assumption, Black line—> Y = px, where p =10/1.5

Conclusion

RPA is an upcoming field, and all the software which supports it is very newly developed. This shows a high chance of automation being a significant part of the future and RPA being one of its pillars.

We found a detailed analysis of efficiency and time management for an email from our project. We used a grade confirmation email bot to demonstrate mailing to students with their names, grade remarks and pass/fail status along with their grade report as an attachment.

We discussed various important parts of the domain, including Digital Transformation, Robotic Process Automation, Automation Anywhere, Email Packages and Credentials & lockers. We learnt different new pieces of information along the same path and used them in our bot.

We pasted our code and explained the working of our bot. We have also highlighted the importance of commenting for cleaner code and better understanding for the reader.

Finally, we learnt the importance of RPA using a practical example and by relating it to traditional practices.

References

- Preface - https://www.linkedin.com/company/silver-touch-technologies-ltd/
- Pg 7 - Digital Transformation - - - - https://www.virtru.com/blog/8-benefits-digital-transformation https://www.servicesbytechdata.com/resources/the-4-types-of-digital-transformation-explaind https://www.virtru.com/blog/8-benefits-digital-transformation
- Pg 8 - RPA - https://www.nice.com/guide/rpa/what-is-the-future-of-rpa
- Pg 9 - Automation Anywhere - https://docs.automationanywhere.com/ https://smartbridge.com/how-does-automation-anywhere-work/
- Pg 11 - Email Package - https://docs.automationanywhere.com/bundle/enterprise-v2019/page/enterprise-cloud/topics/aae-client/bot-creator/commands/cloud-email-automation-command.html
- Pg 12 - Credentials & Lockers - https://docs.automationanywhere.com/bundle/enterprise-v2019/page/enterprise-cloud/topics/control-room/bots/credentials/cloud-credentials-overview.html
- Automation Anywhere for Screenshots
- Desmos for Graph

Glossary

- ★ RPA - Robotic Process Automation
- ★ AA - Automation Anywhere
- ★ STTL - Silver Touch Technologies Ltd.
- ★ API - Application programming interface
- ★ GUI - Graphical User Interface
- ★ Bot - A software application that is programmed to do certain tasks automatically
- ★ Omni Channel - Multichannel approach to sales that seeks to provide customers with a seamless shopping experience.
- ★ Packages - Detailed instructions for users to independently develop custom actions