DAYANANDA SAGAR COLLEGE OF ENGINEERING

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Minor Project Report

on
"Online Class Automation"

Submitted By

Ratan Prakash Shikhari

1DS18CS118

**Fifth Semester B.E
(CSE) in**

**Emerging
Technologies
18CS5DMETG**

Under the guidance
of **Prof. Poornima
K S Assistant
Professor Dept. of
CSE
DSCE, Bangalore**

**Department of Computer Science and
Engineering Dayananda Sagar College of
Engineering Bangelore-78**

PROJECT SYNOPSIS

DEPARTMENT	Computer Science and Engineering				
TITLE OF THE PROJECT	Online Class Automation				
STUDENT NAME/EMAIL/USN/PHONE NO	Ratan Shikhari	Shefali Agarwal	Vrishank Mishra	Rohan Dinesh	Rushang S
	1DS18CS118	1DS18CS117	1DS18CS141	1DS18CS105	1DS18CS108
	ratanshikhari@gmail.com	shefali.agarwal10220@gmail.com	vrishm13@gmail.com	rohandinesh.blr@gmail.com	rushangsc@gmail.com
	7349495624	6360732894	9610345224	9380326117	8073506122
MINI - PROJECT TIMELINE (Tentative Start date- End Date)	September 2020- January 2021				
PROJECT GUIDE DETAILS	Prof. Poornima KS				
FIELD OF PROJECT	The project is in the field of Robotic Process Automation .Robotic process automation (RPA) is the use of software with artificial intelligence (AI) and learning capabilities to handle high-volume, repeatable tasks that previously required humans to perform. These tasks can include queries, calculations and maintenance of records and transactions.				
BACKGROUND OF PROJECT WITH REGARD TO THE DRAWBACK ASSOCIATED WITH EXISTING PRODUCT/PROJECT	With the rise in online classes, an unforeseen task has risen in the lives of students and teachers. It is a monotonous task to send the same link everyday for every class as per the schedule. The general process involves the teacher fetching the link, sending it to a student, and then the student forwarding it to the entire class. It is noticeable that for most online conferencing platforms, the link to a meeting/class is assigned to the account, rather than creating a new one for every instance. This means that a majority of work can be cut out by simply storing the links to every meeting in a key-value pair with the respective time in any suitable data structure (such as a dictionary). This bot takes a similar approach to solving this problem.				
OBJECTIVE OF THE PROJECT	The objective of the project is to reduce the workload on teachers and students who have to regularly forward online class links to different groups repeatedly depending on the timetable				
PROJECT STATEMENT	Automatically scheduling the classes at the students end				
SUMMERY OF THE PROJECT	Covid 19 has resulted in lockdowns and shutting down of education institutions. As a result education is changed and it's no longer held in physical classes. But learning needs a teacher and students, hence our homes are new classes. Online classes are taken on many platforms like Zoom, Cisco WebEx. The meeting id, password and link is shared by the Class Representative of the class. This is a very repetitive task, as the Class Representative has to send the same links again and again. And let's not forget the student is a human and can forget to share the meeting info. Our project focuses on reducing the task of the Class Representative, as our bot would send the links to the student and make them join the class automatically, hence reducing the effort.				
MODE OF CARRYING OUT THE PROJECT (Give details such as Lab/ /Innovation Lab details.)	The project will be carried out in the Computer Science and Engineering Department of DSCE.				

INTENDED BENEFICIARIES OF THE PROJECT (industrial/commercial/R&D/social)	It would be most useful for the teachers and the Class Representative of the class as they have to send the same meeting info to the same set of people. And it also helps the students as it automatically joins the meeting.
ABSTRACT	Online classes generically refers to the interactive classes held online using platforms like zoom and Cisco. Our bots reduces a lot of repetitive tasks like sending links to the students , and student joining the meet. It also reduces the delays of joining the meeting and sending the links.

ABSTRACT

Education is an integral part of our lives. We have been going to school every day since we were kids. Schools and education are a part of our routine. It is unimaginable to not go to schools and colleges. But due to the Covid-19 pandemic, we have all been locked in our homes for almost a year. Everything else can stop, but education shouldn't, so we all adapted to new teaching methods which are vastly different from traditional classroom methods: online classes. This is a new approach to education, any student with a mobile and stable internet can take classes and educate themselves from the comfort of their homes. Educational institutes use online platforms like Zoom and Google meet which are very user friendly. Zoom links are shared to the students by the teacher so that students can join the classes. But sharing those links again and again is an arduous and repetitive task, with it, joining the classes everyday is the same. Sometimes it may happen that the teacher forgets to send the links or the students might forget to join the class due to household distractions, which often happens in our experience. These tasks consist of steps that can be automated with an RPA agent. Our bot eases work for teachers and students by joining the class automatically. It also reduces the human errors, by automatically joining the class and thereby reminding the students that they have a class.

This project is based on Robotic Process Automation (RPA). RPA is a software program that imitates human actions while interacting with a computer application and accomplishing automation of repetitive, rule-based processes. RPA is the use of software with artificial intelligence (AI) and learning capabilities to handle high-volume, repeatable tasks that previously required humans to perform. RPA can be used to automate the labor-intensive tasks such as back office processes, data entry, data validation, report generation etc.

Contents

Chapter 1

Introduction

1.1 Introduction To RPA

Robotic process automation (or RPA) is a form of business process automation technology based on metaphorical software robots (bots) or on artificial intelligence. In traditional workflow automation tools, a software developer produces a list of actions to automate a task and interface to the back-end system using internal application programming interfaces (APIs) or dedicated scripting language. In contrast, RPA systems develop the action list by watching the user perform that task in the application's graphical user interface (GUI), and then perform the automation by repeating those tasks directly in the GUL This can lower the bane to use of automation in products that might not otherwise feature APIs for this purpose.

RPA tools have strong technical similarities to graphical user interface testing tools These tools also automate interactions with the Gul and often do so by repeating a set of demonstration actions performed by a user. RPA tools differ from such systems in that they allow data to be handed in and between multiple applications for instance, receiving email containing an invoice, extracting the data, and then typing that into a bookkeeping system.

1.1.1 INTRODUCTION TO AUTOMATION ANYWHERE

Automation Anywhere is a developer of robotic process automation (RPA) software, which employs software bots to complete business processes. Automation Anywhere is one of the popular RPA vendors offering powerful & user-friendly RPA capabilities to automate any complex tasks. It is one of the "Revolutionary Technology" that changes the way the enterprise operates. This tool combines conventional RPA with intellectual elements like natural language understanding and reading any unstructured data.

Automation Anywhere allows organizations to automate the processes which are performed by the humans. It is a Web-Based Management System which uses a Control Room to run the Automated Tasks. Automation Anywhere tool can automate ends to end business operations for companies.

Automation Anywhere was originally founded as Tethys Solutions, LLC in San Jose, California by Ankur Kothari, Mihir Shukla, Neeti Mehta, and Rushabh Parmani. The company rebranded itself as Automation Anywhere, Inc., in 2010.

1.1.2 About The RPA On Automation Anywhere Platform

Robotic Process Automation (RPA) is software technology that's easy for anyone to use to automate digital tasks. With RPA, software users create software robots, or "bots", that can learn, mimic, and then execute rules-based business processes. RPA automation enables users to create bots by observing human digital actions. Show your bots what to do, then let them do the work. Robotic Process Automation software bots can interact with any application or system the same way people do—except that RPA bots can operate around the clock, nonstop, much faster and with 100% reliability and precision.

1.2 Objectives

The objective of the project is to reduce the workload on teachers and students who have to regularly forward the links of meetings of Zoom or Webex, at the correct time every single day by automating the task of sending the links to student groups, and making the change of schedule much quicker using email.

1.3 Problem Statement

Automatically scheduling (or changing), and launching the classes, meetings, or seminars at the listeners' end.

1.4 Scope Of The Work And Its Importance

The project is of great importance as such: Due to the sudden rise in online interaction, we have managed to sufficiently replace the offline classes, but in turn there have been some small

but pesky annoyances that we didn't foresee. It is extremely important that for utmost productivity, the experience of online interaction be as smooth and automatic as possible, thus this project aims to eliminate these problems.

The scope of the project is, but not limited to:

- Saving the buffer *time* it takes between the point teacher sends the link and the point students join the meeting. The project eliminates the need for the teacher to send the link until he/she decides to use a different link or there is an abrupt change in the schedule. Individually the time saved isn't much, but over the period of the semester multiplied by the number of classes worldwide, it amounts to a considerable human time saved.

- Saving the *collective effort* of the teachers and the students they send the link through. A Teacher may have a lot of classes in a day, and he/she must send the link out for each class, and then the receiving student must do the same for each class. This project thus saves the teacher and the students a lot of monotonous work that offline classes did not have.

- Increasing the regular attendance of students: a lot of times it so happens that even though the student may be on time, they might face trouble inputting the link on time for the class, or due to household distractions entirely miss it. With this project, the bot opens the link on the students' computer on time without fail so, (a) even if the students miss the classes, they will be reminded of it when they see Zoom or Webex running and they can attend the class. (b) since the bot enters the link on time, if there are connection issues, or mic/camera issues, the student will have more time to sort them out and hence have a better chance at attending the class without being very late.

- This project can be very easily applied to other similar instances such as scheduled staff meetings, office meetings, seminars, events, etc.

1.5 System Requirements Specification

Automation Anywhere Platform:

Automation Anywhere Community Edition (version: 11.x.x or above)

System Configuration:

Processor: Intel Core i5 (8th Generation)

Memory: 8 GB DDR4

Storage: 256 GB

Video/Graphics Card: N/A

Network speed: 5 Mbps

Required Configurations:

Processor: Intel Core i3 2.6 GHz (64-Bit) or above

Memory: 4 GB or above

Storage: 32 GB or above (100 to 150 Kb per script, and 40 to 50 Gb for long term usage)

Video/Graphics Card: Not required for community edition

Network speed: 5 Mbps or above (20 Mbps recommended)

Supported Automation Anywhere Platform Versions:

AA 11.x to EOM (End of Maintenance) of 11.3.x

Speed:

Processor Speed   3.4 GHz

Installation:

Requirements:

- Automation Anywhere Community/Enterprise Edition
- Windows PC (for Community Edition)

Procedure:

The following is a workflow for creating and using bots in Enterprise A2019 or Community Edition:

Prerequisites for Cloud deployed and Community Edition prerequisites

Use the checklist to determine whether your device fulfills the requirements for registering with Automation Anywhere Enterprise Cloud and Community Edition.

•   Receive your Enterprise Control Room URL and login credentials. The URL points to your Automation Anywhere Enterprise instance

• If you are an Automation Anywhere Enterprise Community Edition user, the login credentials are those you set when you registered. See Register as a Community Edition user and complete the steps.

• If you are your company's principal administrator and ordered cloud-deployed Enterprise A2019, you receive an email from Automation Anywhere with your URL and credentials.

• Log in to Automation Anywhere Enterprise Control Room.

• To log in to Enterprise A2019, open the Enterprise Control Room URL in your browser, enter your credentials in the login screen, and click Log in.

- Install Bot agent and register device and Set user device credentials.

- The Bot agent is a lightweight application that enables you to run bots on your device by connecting the device to the Enterprise Control Room.
- To run bots on a local machine, install the Bot agent and add the local device to the list of enabled host devices.

- To enable a device for running bots, set the local device credentials.

- Watch the given videos on how to install the Bot agent in Enterprise A2019.

- Install the Bot agent

- If you are using an operating system other than Windows, you will not be able to install the Bot agent at this time. See system requirements. However, you can still build bots using the Bot editor.

CHAPTER 2

Design And Implementation

2.1 Flow Diagram

Online Class Automation Bot
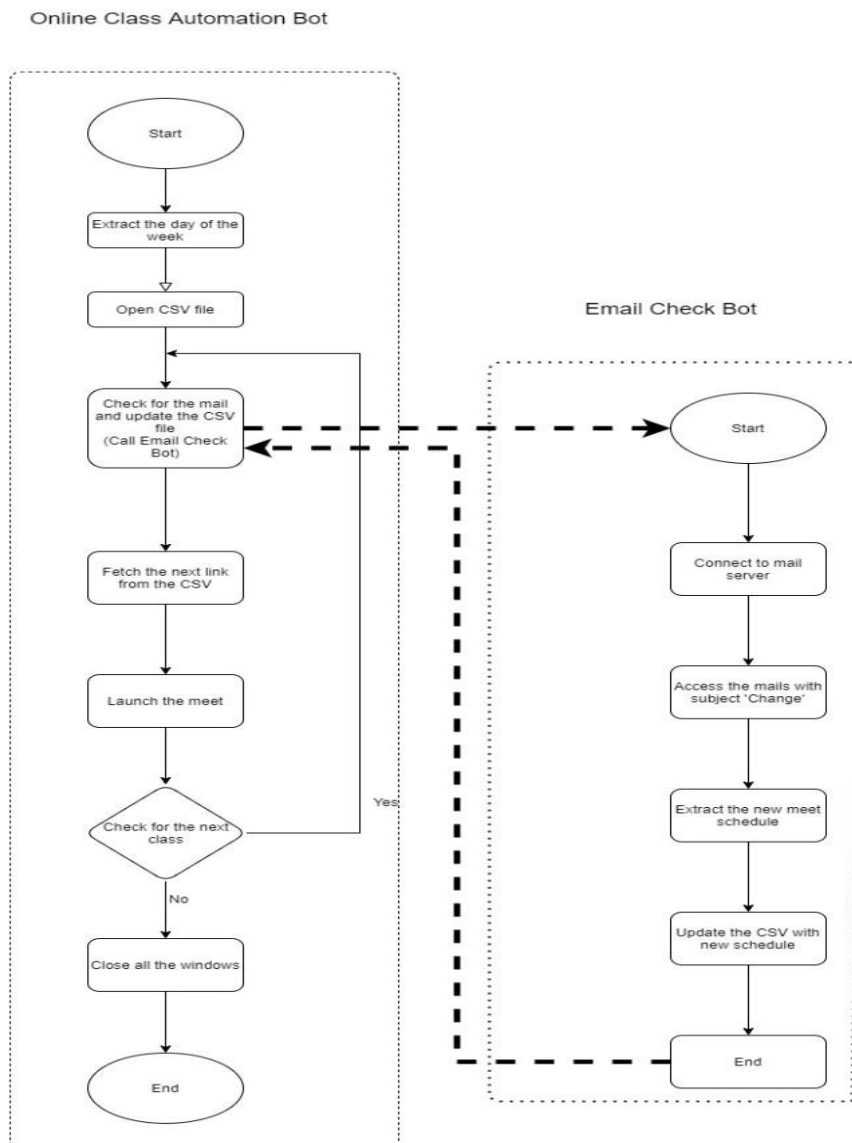
Email Check Bot

- Initially, the bot fetches the day of the week from google.
- The bot then opens the csv file which has the timetable.
- It then checks the mail for any changes in timetable by calling the Email Check Bot.
- The bot connects to the mail server and checks if there are any unread mails with the subject "Change".
- If there are changes it then updates the CSV with the new schedule.
- If there are no changes, it continues with the original CSV.
- The bot fetches the next meeting link from the CSV and launches the meet.
- After a delay (the duration of the class) it checks if there are more classes.
- If yes, it repeats the above steps.
- Else, it closes all the windows and the bot ends.

2.1.1   Process To Be Automated

Everyday, we have to collect zoom meeting links from the respective teachers of every class and join it. A regular occurrence is one student forgetting to collect or send links to all students or other human errors due to which the link might not work. Not only is the students' jobs harder, but also the teachers' job is also tedious. Teachers have to find and send a meeting link for every single class on time.

2.1.2   Why It Should Be Automated

Educational institutes use online platforms like Zoom and Google meet which are very user friendly. Zoom links are shared to the students by the teacher so that students can join the classes. But sharing those links again and again is a repetitive task. And joining the classes is also a repetitive task. This type of repetitive task can easily be done with the help of RPA. Sometimes it may happen the teacher might forget to send the link or the student might forget to join the class due to household distractions, which usually happens. Our bot eases work for teachers and students by joining the class automatically. It also reduces the human errors, by automatically joining the class and reminding the students that they have class .

2.2 Implementation

Bot 1 (Online Class Automation) :

- Steps 1 through 6: we fetch the day of the week, we open google and search for the week and from the resulted search we extract the day.
- Step 7 through 16: we open the CSV file and search for the day (which we extracted from in aforementioned steps)

- Step 8: we open the CSV file
- Step 9: we maximize the CSV file
- Step 10: we assign the day to cell (I2)
- Step 11: we set the cursor to cell B2 (this is done with Bot 2)
- Step 12: we use an action to search the day in the CSV file, the action returns the cell address and it's stored in $CellAddress$ variable
- From step 13 through 16, We use error handlers (this is done for Sundays, as there are no classes on that day)
- Step 17: we move the cursor to the cell address we found at step 12
- Step 18 through 38, we access the meeting links, check for any change in timetable through mail and launch the meeting
- Step 19: we call the second bot (Email Check), which checks for any changes in the schedule and updates the CSV file
- Step 20 through 23: we traverse one cell below to know which class we have first
- Step 24: we use a while loop, the loop will execute until it encounters "END"
- Steps 25 through 38 are executed in a loop
- Steps 25 through 29: we search the subject (which we stored in a variable in step 23) in the list of subject and access the meeting link adjacent to it
- Steps 31 and 32: we launch the link through Chrome and it automatically opens the Zoom app and the meeting begins
- Step 33: we use the delay feature to delay the bot for duration of the class (60 minutes)
- Step 34: we call the second bot again which checks for any change in timetable through the mail. We call this bot in the loop
- Steps 39 and 40: we close Chrome and Excel sheet

BOT 2 (Email Check) :

- Step 1: we connect to the Gmail servers using IMAP, host for the Gmail server is "imap.gmail.com" and port is "993"
- Step 2: we provide the email id and password of the mail for connection.
- Step 3: we give condition to the agent to read only the unread emails, with subject "Change"
- Step 4: we use an if-condition (it does the same work as the step 3)
- Step 5 and 6: We print the content of the email
- Step 7: we separate the time from the pattern and store in a variable
- Step 8: we separate the subject from the pattern and store in another variable

- Step 9: we display both of the messages
- Step 11: we open the same CSV file again to make the changes
- Step 12: We access the value we stored in cell (I2), and pass the day variable which we searched from Chrome in the first bot
- Step 13: the day which we got from the cell (I2) is searched in this step and the cell address of the searched cell is stored
- Step 14: we search the time (which is separated in step 7) to get the row number
- Step 15 and 16: we get the substring from the column and row values we got from step 13 and 14
- Step 18: we assign the new subject to the intersecting cell through the cell address we generated from step 15 and 16
- Step 19: consists of simple messages and a way to understand that the bot has executed its task

CHAPTER 3

Testing/Result And Analysis

3.1 Bot Execution Procedure:

The bot is executed in the following manner :

- Every time the bot is executed it opens the Google search engine and searches for the day

- Then it opens the CSV file which has the timetable

- The bot then triggers the second bot which checks the email and checks for changes

- If changes are present then it modifies the csv file and the changes are reflected

- It copies the link on a default browser tab

- The link triggers the zoom app to open with the specific meeting

- After classes are done, all windows are closed

Information About The Dataset Used

- The Timetable of the classes and the meeting links will be the data set

Screenshots Of Instructions On Control Room
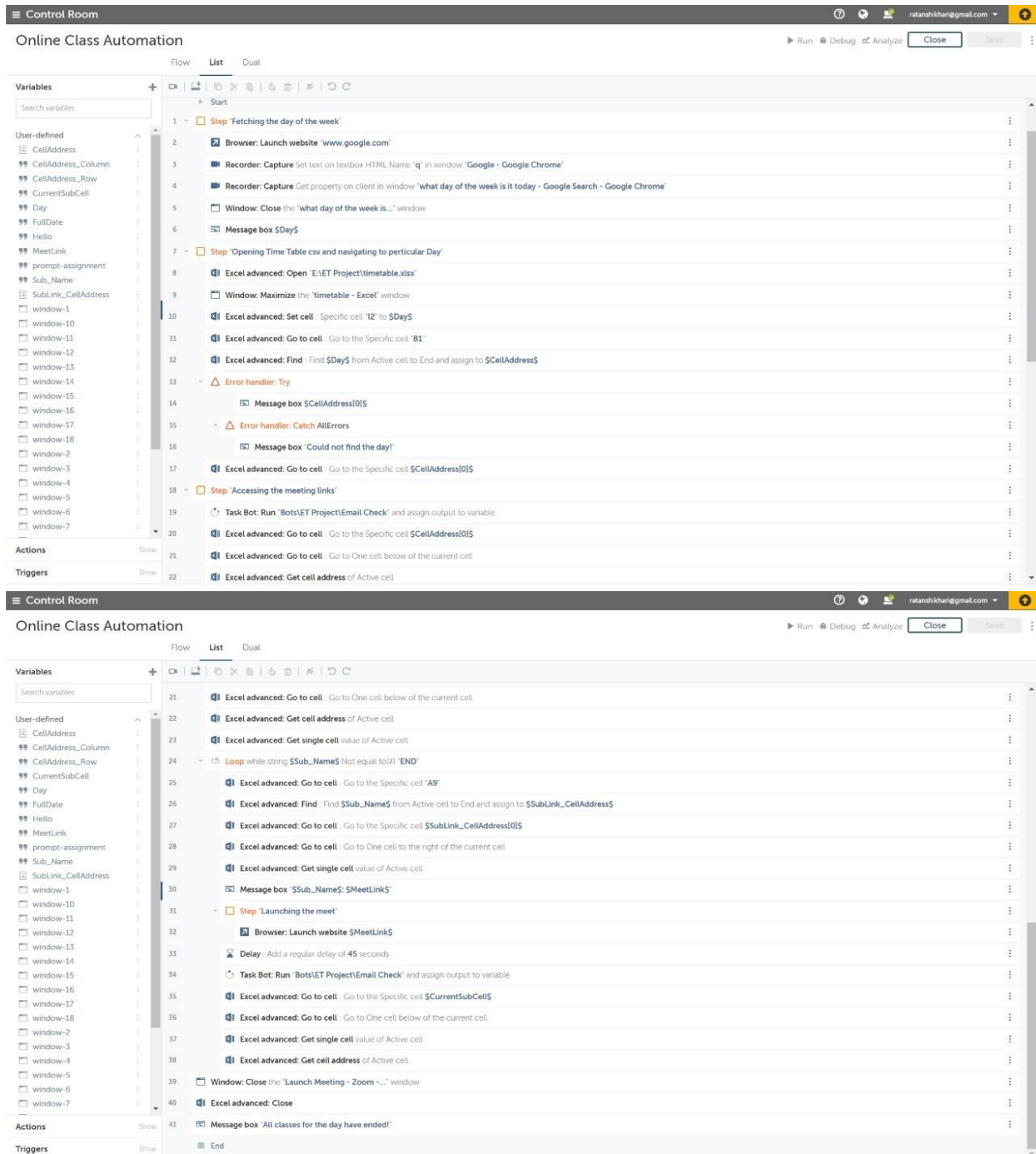
BOT 1 (Online Class Automation) :

fig 3.1 Screenshots of bot 1 instructions on Control Room

BOT 2 (Email check) :

fig 3.2 Screenshots of bot 2 instructions on Control Room

Screenshots Of Data Set:

fig 3.2 Screenshots of Timetable Along with Zoom meeting links
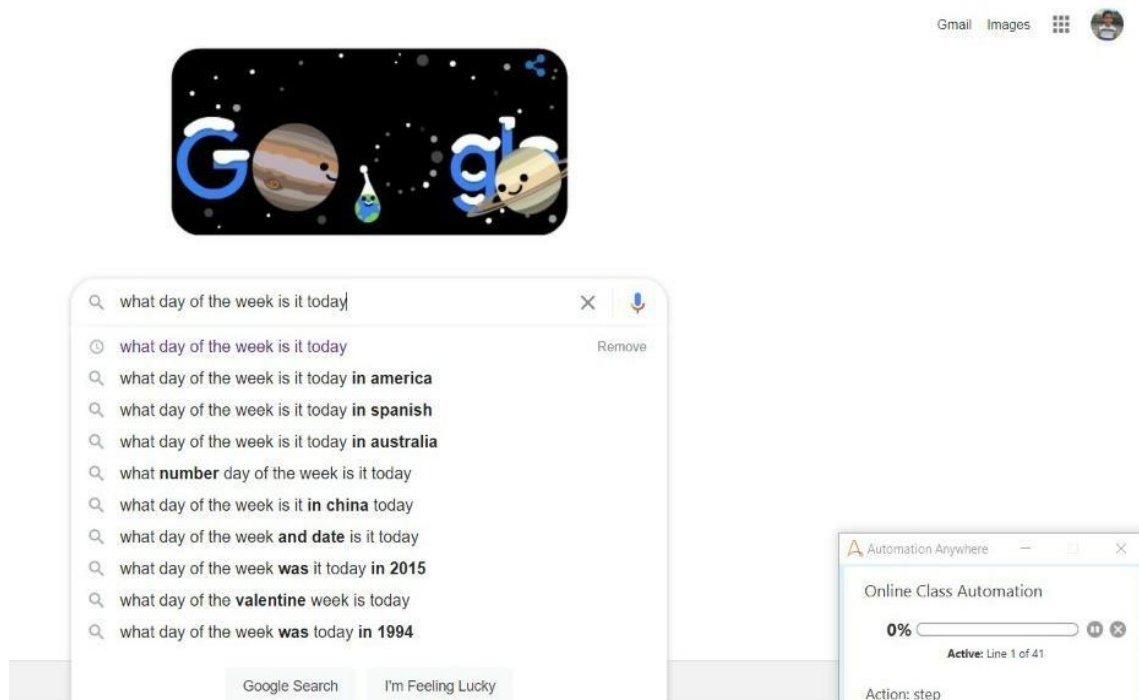
Screenshots Of Outputs And Results:
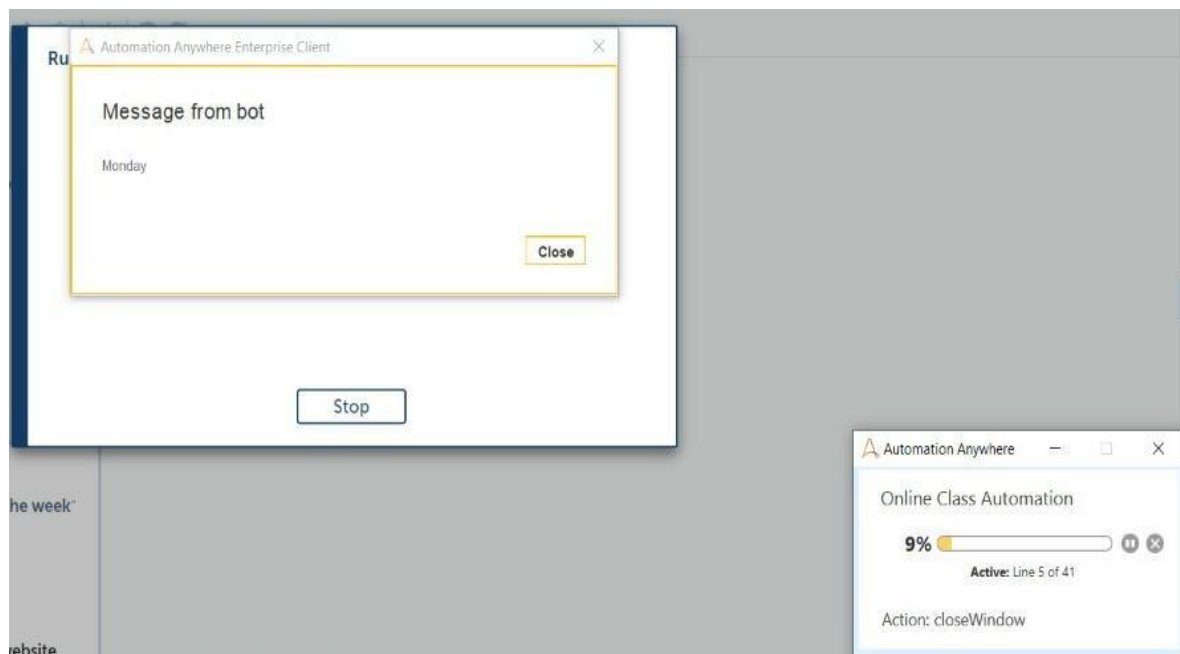

fig3.3.Screenshots of Bot 1 searching for day

fig 3.4 Screenshots of Bot Displaying the day

fig 3.5 Screenshot of Bot 2 running and checking for changes (No Changes)
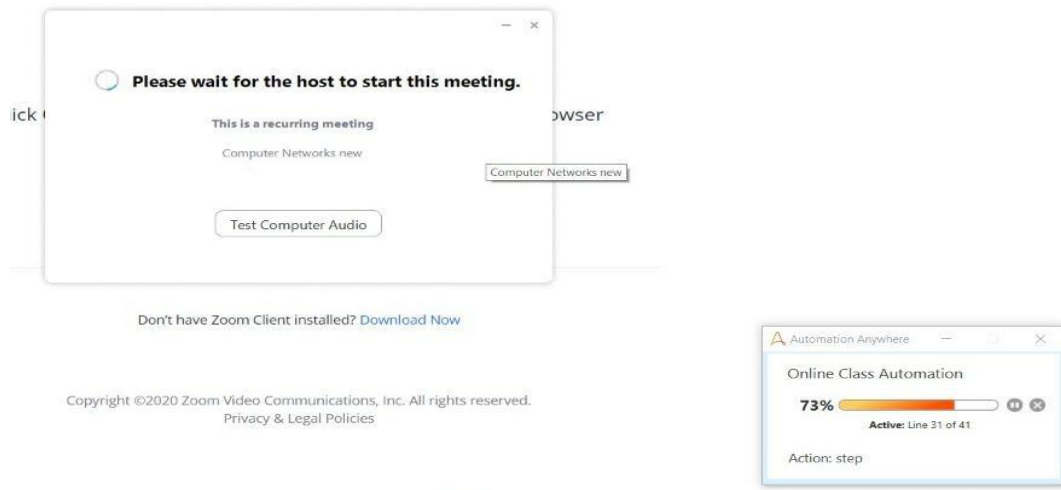

fig 3.6 Screenshot of Bot 2 running and checking for changes (Changes Present)
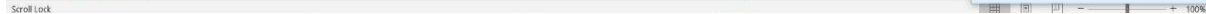
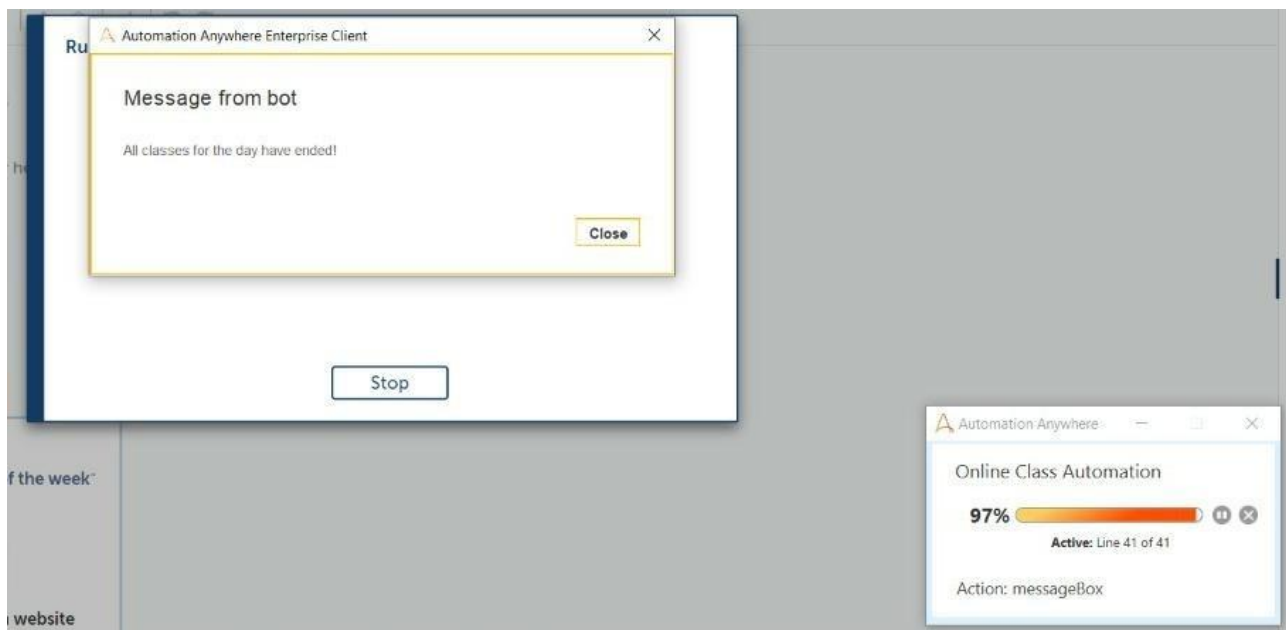fig3.7 Screenshot of Bot 1 launching Zoom meeting

fig 3.8 Screenshot of bot terminating

CHAPTER 4

Conclusions & Future enhancements

Benefits Of Automating:

- Saving the buffer time it takes between the point teacher sends the link and the point students join the meeting

- Saving the collective effort of the teachers and the students they send the link through

- Increasing the regular attendance of students

Applications:

- This project can be very easily applied to other similar instances such as scheduled staff meetings, office meetings, seminars, events, etc.

Future Enhancements:

- In the current state, the CSV file used in the bot is situated in the local device. In the future, the CSV file can be made accessible from Google Drive.

- Currently the bot only supports Zoom Meetings. In the future, more platforms can be added such as Cisco WebEx, Google Meet, Microsoft Teams etc.

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