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UNIVERSITI TEKNOLOGI MALAYSIA

MALAYSIA-JAPAN INTERNATIONAL INSTITUTE OF TECHNOLOGY
(DEPARTMENT OF ELECTRONIC SYSTEMS ENGINEERING)

ADVANCE PROGRAMMING
(SMJE 4383)

Assignment 1

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DATE	:	**7/2/2022**
Github Link	:	**https://github.com/chuench/AdvancedProgramming-Assignment/tree/Assignment_1**

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Automating the CSV generation process using RPA (Robotic Process Automation) with Python refers to the process of using code (Python) and RPA tools to automate the creation of CSV (Comma Separated Values) files [1]. This can involve automating the steps required to extract data from the source, processing it, and then writing it to a CSV file [2]. This can be useful in situations where you need to generate a large number of CSV files in a consistent and reliable manner, such as when dealing with a large amount of data or when the process of generating CSV files is time-consuming and prone to errors [3]. The use of RPA tools and Python can help streamline this process and make it more efficient and accurate [3].

1.2 Project Framework and Interface

There are few software frameworks and interfaces included in this project. To build this automate the CSV Generation Process, the implementations include Ubuntu operating system, CSVpad or CSV Buddy.

Ubuntu operating system is a distribution of an open source based on Debian-based Linux and it is free to download, to use and to share for everyone. This operating system is currently available in three editions, which are desktop, core for Internet of Things (IoT) devices and robots or servers. It can be operated either on a personal computer (PC) or virtual machine, which is very user-friendly [4].

CSVpad is a handy free CSV (Comma-separated values) editor. It supports unicode and it is a portable application [5]. CSVpad can manipulate columns and rows. Export CSV files into html / xml / OpenDocument Spreadsheet (ods) and Microsoft Excel 8.0 (xls) files [5]. In this project, CSVpad is used for creating the new CSV file.

CSV Buddy can help to make the CSV files ready to be imported by a variety of software [6]. For this project, CSV Buddy is not used.

1.3 Working Principle

This project is started by preparing our Ubuntu operating system with CSVpad or CSV Buddy, downloading all the required materials such as datasets in .csv before started the procedures. Steps and codes that are available in the Chapter 2 were followed to copy the data from CSV file to new CSV file and send the email notification once the process is completed.

1.4 Existing System

In this Advanced Programming subject, students are required to run the code and the CSV files by using Robotic Process Automation (RPA) python and the local host Ubuntu operating server in this assignment.

1.5 Problem Statements

An easy and quick way is provided by Python to copy data from CSV file to new CSV file. Students are requested to study and learn the way to design an automate the CSV Generation Process by using the Python programming language, local host Ubuntu operating system and other framework or interface such as CSVpad or CSV Buddy.

1.6 Objectives

To develop an automate the CSV Generation Process using RPA Python, the objectives of this project are as below:

a) To copy the data from existing CSV file to new CSV file by using Python script code and Robotic Process Automation (RPA).

b) To send the notification to the email once the data are completely copied.

CHAPTER 2: METHODOLOGY

2.1 Software Required

1. VMWare Workstation Player16

Figure 2.1: Logo of VMWare Workstation Player 16 software

VMware Workstation Player is a free and easy-to-use virtualization software for Windows and Linux operating systems. It allows users to run multiple virtual machines on a single physical computer, each with its own operating system and applications. This enables users to test and develop applications on multiple operating systems and configurations without interfering with the host system. We used VMWare as a virtual machine to run in Ubuntu operating system.

2. Python 3.10

Figure 2.2: Logo of Python 3.10 software

Python 3.10 is a version of the Python programming language. Python is a high-level, interpreted, and general-purpose programming language. It is known for its readability, ease to use, and wide variety of libraries and modules for various tasks, such as web development, scientific computing, and data analysis. Python 3.10 was released in October 2021 and includes features such as string methods for removing prefixes and suffixes, and improvements in type annotations, among others. Python is an open-source language, which means that it is free to use and the source code is publicly available. We used python3 as the programming language in this project.

3. CSVPad

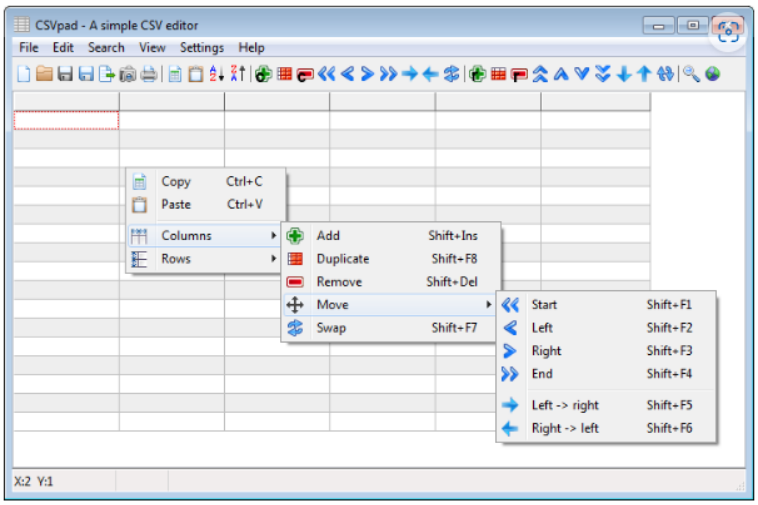


Figure 2.3 GUI of CSVPad

CSVpad is a handy free CSV (Comma-separated values) editor. It support's unicode and it is a portable application. CSVpad can manipulate columns and rows. Export CSV files into html / xml / OpenDocument Spreadsheet (ods) and Microsoft Excel 8.0 (xls) files. CSVpad is based on the DMcsvEditor. CSVpad works under Windows 8, Windows 7, Windows Vista, Windows XP & Linux. We use CSVPad to read and create the csv file in this project.

2.2 Modules Used

1. csv (import csv)

The csv module in Python is a built-in library for reading and writing CSV (Comma-Separated Values) files. CSV files are a popular format for storing tabular data as plain text, with each line representing a row of data and each field separated by a comma. The csv module provides functionality for reading from and writing to CSV files and can handle tasks such as automatically converting data between different data types, dealing with newline characters, and handling quotes within fields. We use csv module to read and write the Vaccination.csv and write the file into the NewCSVdataFile.csv file.

2. smtplib (import smtplib)

The smtplib module in Python is a built-in library that provides functionality for sending email messages using the Simple Mail Transfer Protocol (SMTP). It allows a Python program to send email messages to an SMTP server, which then forwards the messages to their final destination. The smtplib module provides a simple interface for connecting to an SMTP server, sending messages, and handling common errors. It can be used to automate email notifications, send bulk email messages, and more.

2.3 Procedures Explanation

Below shows the full coding in the project. The detail of the code will we upload in the GitHub and will be attached in the appendix below. The procedures are summarized as below:

```
import csv
import smtplib

# Read the selected CSV file
filename = 'Vaccination.csv'
with open(filename, 'r') as file:
    reader = csv.reader(file)
    data = [row for row in reader]

# Save the data in a new CSV file
new_filename = 'NewCSVdataFile.csv'
with open(new_filename, 'w', newline='') as file:
    writer = csv.writer(file)
    writer.writerows(data)

# Send an email notification
sender = "mingchuen07@gmail.com"
receiver = "xiaoming1xf@outlook.com"
message = f"Subject: Succesfull copying data from {filename} to {new_filename}\n\nData
copy task has been completed successfully."

with smtplib.SMTP("smtp.gmail.com", 587) as smtp:
    smtp.ehlo()
    smtp.starttls()
    smtp.login(sender, "xkucdofapzqtrlye")
    smtp.sendmail(sender, receiver, message)
```

Figure 2.4: Full code of the project.

Steps for implementation

1. Install CSVPad in the Ubuntu.
2. Download any csv file available on the internet. In this case we selected the file “Vaccination.csv”.
3. Manually create a new blank csv file using CSVPad with the name “NewCSVdataFile.csv”.
4. Put both file “Vaccination.csv” and “NewCSVdataFile.csv” in a same directory and create a python script file with name ass1.py and start implementation of the code.
5. Import csv and smtplib module.
6. Reads data from the CSV file named "Vaccination.csv" using the csv module.
7. Writes the data from the “Vaccination.csv” to a blank csv file by manual create with the named "NewCSVdataFile.csv" using the csv module.
8. Sends an email notification to "xiaoming1xf@outlook.com" from "mingchuen07@gmail.com" using the smtplib module, indicating that the task of copying the data from one file to another has been completed successfully. The email is sent via Gmail's SMTP server.

CHAPTER 3: RESULTS AND DISCUSSION

3.1 Results

Below shows the file of "Vaccination.csv" opened using CSVPad. The file was about the vaccination status in every state of Malaysia.

Vaccination.csv

CSVpad - A simple CSV editor

File Edit Search View Settings Help

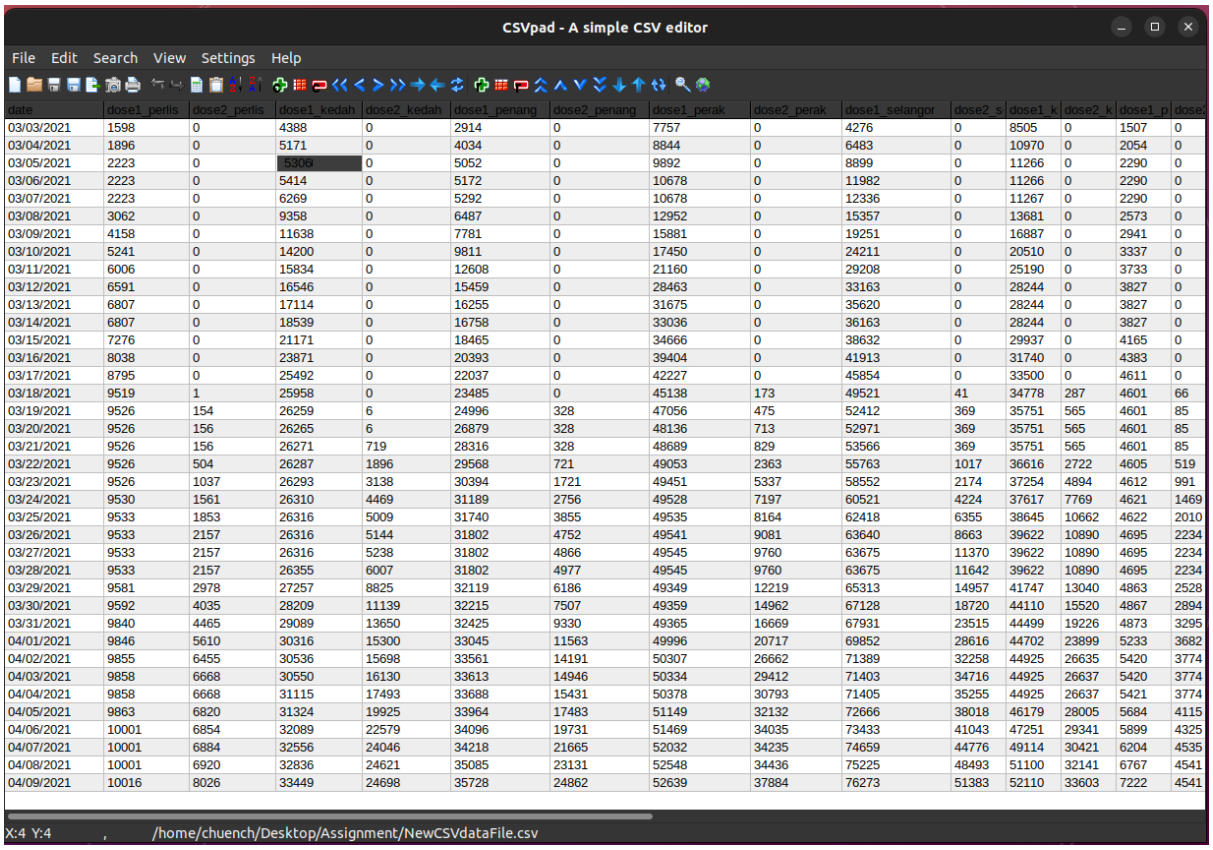
date	dose1_perlis	dose2_perlis	dose1_kedah	dose2_kedah	dose1_penang	dose2_penang	dose1_perak	dose2_perak	dose1_selangor	dose2_s	dose1_k
03/03/2021	1598	0	4388	0	2914	0	7757	0	4276	0	8505
03/04/2021	1896	0	5171	0	4034	0	8844	0	6483	0	10970
03/05/2021	2223	0	SSI	0	5052	0	9892	0	8899	0	11266
03/06/2021	2223	0	5414	0	5172	0	10678	0	11982	0	11266
03/07/2021	2223	0	6269	0	5292	0	10678	0	12336	0	11267
03/08/2021	3062	0	9358	0	6487	0	12952	0	15357	0	13681
03/09/2021	4158	0	11638	0	7781	0	15881	0	19251	0	16887
03/10/2021	5241	0	14200	0	9811	0	17450	0	24211	0	20510
03/11/2021	6006	0	15834	0	12608	0	21160	0	29208	0	25190
03/12/2021	6591	0	16546	0	15459	0	28463	0	33163	0	28244
03/13/2021	6807	0	17114	0	16255	0	31675	0	35620	0	28244
03/14/2021	6807	0	18539	0	16758	0	33036	0	36163	0	28244
03/15/2021	7276	0	21171	0	18465	0	34666	0	38632	0	29937
03/16/2021	8038	0	23871	0	20393	0	39404	0	41913	0	31740
03/17/2021	8795	0	25492	0	22037	0	42227	0	45854	0	33500
03/18/2021	9519	1	25958	0	23485	0	45138	173	49521	41	34778
03/19/2021	9526	154	26259	6	24996	328	47056	475	52412	369	35751
03/20/2021	9526	156	26265	6	26879	328	48136	713	52971	369	35751
03/21/2021	9526	156	26271	719	28316	328	48689	829	53566	369	35751
03/22/2021	9526	504	26287	1896	29568	721	49053	2363	55763	1017	36616
03/23/2021	9526	1037	26293	3138	30394	1721	49451	5337	58552	2174	37254
03/24/2021	9530	1561	26310	4469	31189	2756	49528	7197	60521	4224	37617
03/25/2021	9533	1853	26316	5009	31740	3855	49535	8164	62418	6355	38645
03/26/2021	9533	2157	26316	5144	31802	4752	49541	9081	63640	8663	39622
03/27/2021	9533	2157	26316	5238	31802	4866	49545	9760	63675	11370	39622
03/28/2021	9533	2157	26355	6007	31802	4977	49545	9760	63675	11642	39622
03/29/2021	9581	2978	27257	8825	32119	6186	49349	12219	65313	14957	41747
03/30/2021	9592	4035	28209	11139	32215	7507	49359	14962	67128	18720	44110
03/31/2021	9840	4465	29089	13650	32425	9330	49365	16669	67931	23515	44499
04/01/2021	9846	5610	30316	15300	33045	11563	49996	20717	69852	28616	44702
04/02/2021	9855	6455	30536	15698	33561	14191	50307	26662	71389	32258	44925
04/03/2021	9858	6668	30550	16130	33613	14946	50334	29412	71403	34716	44925
04/04/2021	9858	6668	31115	17493	33688	15431	50378	30793	71405	35255	44925
04/05/2021	9863	6820	31324	19925	33964	17483	51149	32132	72666	38018	46179
04/06/2021	10001	6854	32089	22579	34096	19731	51469	34035	73433	41043	47251
04/07/2021	10001	6884	32556	24046	34218	21665	52032	34235	74659	44776	49114

X:4 Y:4 , /home/chuench/Desktop/Assignment/Vaccination.csv

Figure 3.1: File content of "Vaccination.csv".

Below shows the file of “NewCSVdataFile.csv” opened using CSVPad. The file from the “Vaccination.csv” are successfully copied into the new files.

NewCSVdataFile.csv



date	dose1_perlis	dose2_perlis	dose1_kedah	dose2_kedah	dose1_penang	dose2_penang	dose1_perak	dose2_perak	dose1_selangor	dose2_s	dose1_k	dose2_k	dose1_p	dose2
03/03/2021	1598	0	4388	0	2914	0	7757	0	4276	0	8505	0	1507	0
03/04/2021	1896	0	5171	0	4034	0	8844	0	6483	0	10970	0	2054	0
03/05/2021	2223	0	5306	0	5052	0	9892	0	8899	0	11266	0	2290	0
03/06/2021	2223	0	5414	0	5172	0	10678	0	11982	0	11266	0	2290	0
03/07/2021	2223	0	6269	0	5292	0	10678	0	12336	0	11267	0	2290	0
03/08/2021	3062	0	9358	0	6487	0	12952	0	15357	0	13681	0	2573	0
03/09/2021	4158	0	11638	0	7781	0	15881	0	19251	0	16887	0	2941	0
03/10/2021	5241	0	14200	0	9811	0	17450	0	24211	0	20510	0	3337	0
03/11/2021	6006	0	15834	0	12608	0	21160	0	29208	0	25190	0	3733	0
03/12/2021	6591	0	16546	0	15459	0	28463	0	33163	0	28244	0	3827	0
03/13/2021	6807	0	17114	0	16255	0	31675	0	35620	0	28244	0	3827	0
03/14/2021	6807	0	18539	0	16758	0	33036	0	36163	0	28244	0	3827	0
03/15/2021	7276	0	21171	0	18465	0	34666	0	38632	0	29937	0	4165	0
03/16/2021	8038	0	23871	0	20393	0	39404	0	41913	0	31740	0	4383	0
03/17/2021	8795	0	25492	0	22037	0	42227	0	45854	0	33500	0	4611	0
03/18/2021	9519	1	25958	0	23485	0	45138	173	49521	41	34778	287	4601	66
03/19/2021	9526	154	26259	6	24996	328	47056	475	52412	369	35751	565	4601	85
03/20/2021	9526	156	26265	6	26879	328	48136	713	52971	369	35751	565	4601	85
03/21/2021	9526	156	26271	719	28316	328	48689	829	53566	369	35751	565	4601	85
03/22/2021	9526	504	26287	1896	29568	721	49053	2363	55763	1017	36616	2722	4605	519
03/23/2021	9526	1037	26293	3138	30394	1721	49451	5337	58552	2174	37254	4894	4612	991
03/24/2021	9530	1561	26310	4469	31189	2756	49528	7197	60521	4224	37617	7769	4621	1469
03/25/2021	9533	1853	26316	5009	31740	3855	49535	8164	62418	6355	38645	10662	4622	2010
03/26/2021	9533	2157	26316	5144	31802	4752	49541	9081	63640	8663	39622	10890	4695	2234
03/27/2021	9533	2157	26316	5238	31802	4866	49545	9760	63675	11370	39622	10890	4695	2234
03/28/2021	9533	2157	26355	6007	31802	4977	49545	9760	63675	11642	39622	10890	4695	2234
03/29/2021	9581	2978	27257	8825	32119	6186	49349	12219	65313	14957	41747	13040	4863	2528
03/30/2021	9592	4035	28209	11139	32215	7507	49359	14962	67128	18720	44110	15520	4867	2894
03/31/2021	9840	4465	29089	13650	32425	9330	49365	16669	67931	23515	44499	19226	4873	3295
04/01/2021	9846	5610	30316	15300	33045	11563	49996	20717	69852	28616	44702	23899	5233	3682
04/02/2021	9855	6455	30536	15698	33561	14191	50307	26662	71389	32258	44925	26635	5420	3774
04/03/2021	9858	6668	30550	16130	33613	14946	50334	29412	71403	34716	44925	26637	5420	3774
04/04/2021	9858	6668	31115	17493	33688	15431	50378	30793	71405	35255	44925	26637	5421	3774
04/05/2021	9863	6820	31324	19925	33964	17483	51149	32132	72666	38018	46179	28005	5684	4115
04/06/2021	10001	6854	32089	22579	34096	19731	51469	34035	73433	41043	47251	29341	5899	4325
04/07/2021	10001	6884	32556	24046	34218	21665	52032	34235	74659	44776	49114	30421	6204	4535
04/08/2021	10001	6920	32836	24621	35085	23131	52548	34436	75225	48493	51100	32141	6767	4541
04/09/2021	10016	8026	33449	24698	35728	24862	52639	37884	76273	51383	52110	33603	7222	4541

Figure 3.2: File content of “NewCSVdataFile.csv”.

Once completed copied, notification will be sent to the email. Below shows the email received notification from the mingchuen07@gmail.com in the receiver xiaoming1xf@outlook.com.

Sender: mingchuen07@gmail.com

Receiver: xiaoming1xf@outlook.com

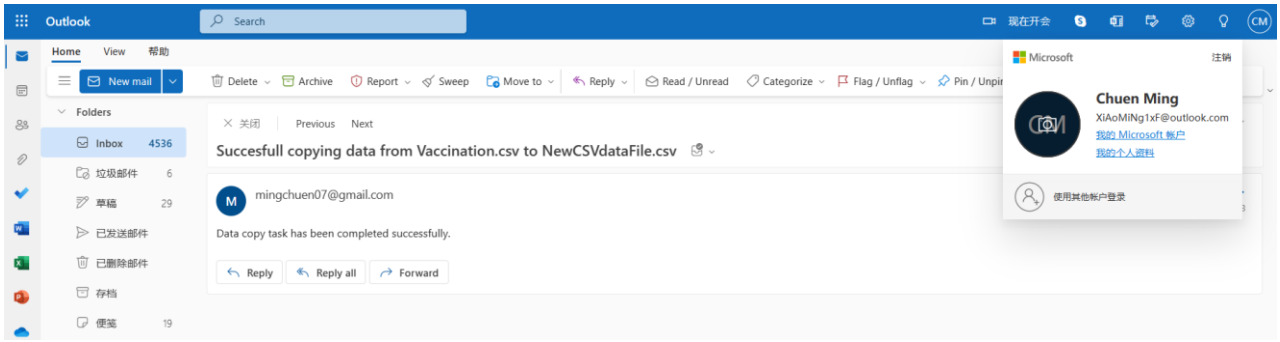


Figure 3.3: Email notification received

3.2 Discussion

In this project, the python script reads data from a CSV file, writes the data to a new CSV file and sends an email notification to inform the recipient when the data has been successfully copied. The csv module is used to read the data from the original file and write the data to a new file. The smtplib module is used to send the email notification, which is sent via Gmail's SMTP server.

The script starts by reading the data from the file “Vaccination.csv” and storing it in a variable called “data”. The “with” statement is used to open the file and automatically close it when the block of code inside the statement has completed. The “csv. reader” object is used to read the data from the file, and the resulting data is stored in a list of rows.

Next, we write the data to a new file named “NewCSVdataFile.csv”. The “with” statement is used again to open the new file, this time in write mode, and automatically close it when the block of code inside the statement has completed. The “csv.writer” object

is used to write the data to the new file, and the “writerows” method is used to write each row of data to the file.

Once successfully copied the csv data, it sends an email notification to xiaoming1xf@outlook.com using the “smtplib” module. The “with” statement is used to create an SMTP object and automatically close the connection when the block of code inside the statement has completed. The “ehlo” and “starttls” methods are used to initialize the connection to the Gmail SMTP server. The “login” method is used to log in to the Gmail account, and the “sendmail” method is used to send the email notification. The subject of the email and the message body are specified as variables.

CHAPTER 4: CONCLUSION

4.1 Conclusion

In this assignment, all the objectives are achieved. The data from existing CSV file has successfully copied to the new CSV file by using Python script code and Robotic Process Automation (RPA). The notification also successfully sends when the data is completely copied.

References

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