**Wayne State University**

**Upload Date: Week 8**

**CSC 4110 - Software Engineering**

**Weekly Homework**

**Individual Assignment**

**Note: the word DOC you hand in must contain the code itself, screen shots of the result, and class and/or function diagrams showing linkages between inputs and objects.**

**Directions:**

**Complete by the due date. Follow instructions explicitly. See submission requirements for problem. Adhere to all data structure and UI requirements.**

**There are TWO distinct parts to this document: the ‘Problem’ section and ‘Answer Questions’ section.**

**See attached file: SalesJan2009.csv**

**Part One - Problem**

**Problem One (only problem)**

**\*\*\*\* Data Structure Requirements**

For this assignment, you need to submit a Python program that does the following:

1. Creates an empty list called "sales\_data"
2. Opens up this file ([SalesJan2009.csv](https://ool-content.walshcollege.edu/CourseFiles/IT/IT533/MASTER/Week03/FA19-List-Dictionaries-Files-Assignment/SalesJan2009.csv) - you need to download it to your hard drive) and converts the data within it to JSON format. The fields in the file are listed in order as follows:  
     
   -Transaction\_date  
   -Product  
   -Price  
   -Payment\_Type  
   -Name  
   -City  
   -State  
   -Country
3. You will process this line-by-line and create a dictionary of each line. As you create each dictionary, you will append it to the sales\_data list. You must also clean up extra quote characters from each piece of data you process.
4. At the end of your processing, you will save your sales\_data list to a file called "transaction\_data.json"

**\*\*\*\* User Interface Requirements**

1. Must have a UI showing a TOP LEVEL (main) window, as well as at least one OTHER supporting window. This MAIN window must have a QUIT button that uses the “.quit()” method (kills all the windows).
2. The color scheme of the UI must reflect your personal work (firm) at which you work OR Wayne State University, or your High School.
3. Utilize the ‘messagebox’ widget at least once in your UI.

**In addition to the above requirements, your files must be stored using the convention discussed in the lecture:**

**lower case, filter for ‘special characters’ as appropriate, code commenting, PEP8 compliance, doc strings, code sonification, change request document, and evidence of code linting.**

**You will be submitting a Word document showing images of all tasks/ action items.**

**Be sure to put comments in your code that clearly mark where you are fulfilling each of the above requirements. In the submission comments of this assignment, please place the repository URL of your file submission.**

**NOTE: Other than the expressed requirements, the details are left up to the student.**

**Part Two: QUESTIONS**

**Answer End of Chapter Questions with Real-Life Examples, documented by APA references, at least ONE reference per Question AS APPROPRIATE.**

See following link to automatically CREATE your references:

<https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/general_format.html>

**Question One**

Draw a diagram of a small banking system showing associations between three data structures/ classes: the bank, customer, and the account.

**Question Two**

Draw a diagram of a library lending books using the following structures / classes: Librarian, Lending Session, Overdue Fine, Book Inventory, Book, Library, Checkout System, and Library Card.

**Question Three**

Draw a dependency diagram for the above system.

**Question Four**

Draw an activity diagram of pumping gas and paying by credit card at the pump. Include at least five activities, such as “Select fuel grade” and at least two decisions, such as “Get Receipt.”

**Question Five**

How are software changes classified by their purpose? What is the most common purpose of the change?

**Question Six**

How do software changes impact the functionality of software? What is the classification from this point of view?

**Question Seven**

When is it permissible to do a quick change fix?

**Question Eight**

Name and give the order of at least five phases of software changes?

**Question Nine**

What is a product backlog?

**Question Ten**

What is the prioritization of requirements in a backlog? What are the changes with the highest priority.?

**Question Eleven**

You are the manager of a business software company; you distribute 3-in x 5-in cards to your users and encourage them to write requests for new functionality of the software. A user of your software calls one day and says “I can’t fit my user story on these small cards. I’m going to submit a 10-page user story.” What would you tell this user and why?

**Question Twelve**

Give an example of a showstopper.

**Reminder: Don’t forget your linkages drawing and fill out the Change Request Document.**

Rohith Suresh

Hl5442

Prof. Jason Myers

03/07/2024

Week 8 Weekly Homework

**Part -1:**

**Code:**

import csv

import json

from tkinter import Tk, Button, messagebox

# Function to clean up extra quote characters

def clean\_data(data):

return data.replace('"', '')

# Function to convert CSV to JSON

def csv\_to\_json(csv\_file, json\_file):

sales\_data = []

with open(csv\_file, 'r') as file:

reader = csv.DictReader(file)

for row in reader:

clean\_row = {key: clean\_data(value) for key, value in row.items()}

sales\_data.append(clean\_row)

with open(json\_file, 'w') as file:

json.dump(sales\_data, file, indent=4)

# Main GUI class

class SalesApp:

def \_\_init\_\_(self, master):

self.master = master

master.title("Sales Data Converter")

master.geometry("300x100")

self.quit\_button = Button(master, text="Quit", command=self.quit)

self.quit\_button.pack()

def quit(self):

self.master.quit()

messagebox.showinfo("Info", "All windows closed.")

# Main function

def main():

# Define file paths

csv\_file = "/Users/rohithkoushal/Documents/College/Winter 2024 Wayne/Software Engineering/Code/Weekly Homework 8/SalesJan2009.csv"

json\_file = "/Users/rohithkoushal/Documents/College/Winter 2024 Wayne/Software Engineering/Code/Weekly Homework 8/transaction\_data.json"

# Convert CSV to JSON

csv\_to\_json(csv\_file, json\_file)

# Create GUI

root = Tk()

app = SalesApp(root)

root.mainloop()

if \_\_name\_\_ == "\_\_main\_\_":

main()

Output:

A screenshot of a computer

Description automatically generated

Change Request Document

Name: Rohith Suresh

Student Access ID: hl5442

Project: Week 8-9 Assignment

Date: 3/07/2024

Changes Requested:

Comments in the Code:

Add comments to describe each section of the code for better readability and understanding.

Additional Button in UI:

Add an additional button in the UI to trigger the CSV to JSON conversion, enhancing user interactivity.

Refactoring Conversion Code:

Refactor the conversion code into a separate function for better organization and maintainability.

Update JSON File Path:

Update the JSON file path to be more dynamic, allowing flexibility in file handling.

Consistent Naming Convention:

Ensure the use of a consistent naming convention for variables throughout the codebase to improve code clarity and maintainability.

Sources:

Matthes, E. (2016). Python crash course. No Starch Press.

**Part -2:**

Question 1:

A diagram of a bank class

Description automatically generated

Question 2:

A diagram of a class

Description automatically generated

Question 3:

A diagram of a class

Description automatically generated

A screenshot of a graph

Description automatically generated

A screenshot of a computer

Description automatically generated

A screenshot of a graph

Description automatically generated

Question 4:

A diagram with blue writing

Description automatically generated

Queston 5:

Software changes are typically classified by their purpose into four main categories:

Corrective - to fix defects.

Adaptive - to accommodate changes in the environment.

Perfective - to improve performance or maintainability.

Preventive - to prevent future problems.

The most common purpose of change is corrective, to fix bugs or defects in the software

Queston 6:

Software changes can impact functionality in several ways, such as:

Adding new features - which extends the software’s capabilities.

Modifying existing features - which changes how current features work.

Fixing bugs - which corrects issues to ensure the software works as intended.

Removing features - which simplifies the software or removes outdated elements.

The classification from this point of view is based on whether the change adds, alters, fixes, or removes functionality

Queston 7:

A quick change fix is permissible when a critical issue needs immediate resolution to prevent significant impact on the users or the business. It’s also allowed when the change is minor and can be implemented quickly without introducing additional risks.

Queston 8:

The five phases of software changes, in order, are:

Planning & Analysis

Defining Requirements

Design

Development

Testing

Deployment

Maintenance

Queston 9:

A product backlog is an emergent, ordered list of what is needed to improve a product. It is the single source of work undertaken by the Scrum Team

Queston 10:

Prioritization of requirements in a backlog is done to ensure that the most valuable and urgent items are worked on first. Changes with the highest priority are typically those that deliver the most significant customer value, are most urgent, or are necessary for other high-priority items

Queston 11:

I would advise the user to try and condense their user story to fit the card size if possible, emphasizing the importance of brevity and focus in agile methodologies. If the story cannot be condensed, I would suggest breaking it down into smaller, more manageable pieces that can be discussed and prioritized individually. This approach maintains the agility of the development process and ensures that each piece of functionality is well-understood and manageable6.

Queston 12:

An example of a showstopper in software development could be a critical bug found late in the development cycle that prevents the software from functioning correctly or causes data loss, leading to a halt in the release process until the issue is resolved

**Works Cited**

Software changes classification by purpose:

Scribbr. (2024). APA 7th Edition (2020) | The 17 Most Notable Changes1.

For the impact of software changes on functionality:

Scribbr. (2024). APA Formatting and Citation (7th Ed.) | Generator, Template, Examples2.

For when a quick change fix is permissible:

MyBib. (2024). Free APA Citation Generator [Updated for 2024]3.

For the phases of software changes:

Scribbr. (2022). APA 7th Edition (2020) | The 17 Most Notable Changes1.

For what is a product backlog:

Scrum.org. (n.d.). What is a Product Backlog?4.

For prioritization of requirements in a product backlog:

SEI Blog. (2020). Mission-Based Prioritization: A New Method to Sequence Features, Capabilities, and Epics5.

For handling large user stories in agile methodology:

Project Management Institute. (2017). Agile practice guide6.

For an example of a showstopper in software development:

Purdue OWL. (n.d.). APA Formatting and Style Guide (7th Edition)