



Assessment 3 Information and Rubric

Subject Code	ICT505
Subject Name	Software Development
Assessment Number and Title	Assessment 3: Visualizing and Data Distribution by Python Based GUI Applications
Assessment Type	Individual Assessment
Length / Duration	1500 words
Weighting %	Total: 30%, Report: 20%, Viva 10%
Total Marks	100
Submission	Online Submission
Due Date	Technical Report: Week-11 (Sunday 23:59) Presentations/Viva: Week-12 (During Class)
Mode	Individual
Format	Report In-Class Presentations/VIVA (Technical Work) Python Source Code and Outcomes

Assessment Description and Instructions

This assessment is designed to test student's understanding and skills in advanced Python plotting using libraries such as Matplotlib, Seaborn, and Geopandas. Take your time to read and comprehend each question and task and provide well-documented and effective solutions. The students are well familiar now up till week 10 about the Python plotting libraries. Keep the contents in mind and perform the following tasks by using Python IDE's such as Spyder or PyCharm.

Task-1 (10 Marks)

Analysing Stock Data: a) You will be given a CSV file containing stock price data, write a Python program that reads the file and creates a line plot showing the closing prices over time. b) Enhance the plot by adding labels for the x-axis, y-axis, and a title. Customize the plot to improve its readability.

Task-2 (10 Marks)

Visualizing Data Distributions: a) Utilize the Seaborn library to create a box plot showing the distribution of data across multiple categories. You will be given a dataset for this task. b) Customize the box plot by changing the colors, adding labels, and improving the overall appearance of the plot.

Task-3 (15 Marks)

a) In this task you have to create a shapefile and using the Geopandas library, load that shapefile containing geographic boundaries of a country or region.

- b) Create a choropleth map that visualizes a specific attribute of the dataset, such as population density or GDP per capita.
- c) Customize the map by adding a legend, adjusting the colour scheme, and providing a title.

Tasks-4 (7x5=35 Marks)

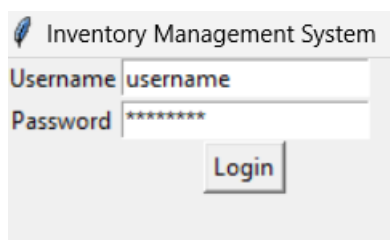
Tkinter is a library for the Python programming language that is used to develop GUIs for several platforms. Tkinter offers a straightforward method of creating both basic desktop applications and more complicated software with an intuitive interface. Python's default graphical user interface (GUI) module is called Tkinter. It offers a widget library that may be used to rapidly develop graphical user interfaces. Tkinter is an easy-to-use GUI toolkit for Python that is based on the Tk toolkit, originally designed for the Tcl programming language.

In this task, students are asked with developing a Python GUI-based inventory system. The main goal of this task is to provide an efficient and user-friendly inventory management system that streamlines operations, improves accuracy, and enhances overall inventory control. The task will demonstrate proficiency in Tkinter GUI development, database management, data manipulation, and user interface design.

Description and Instructions

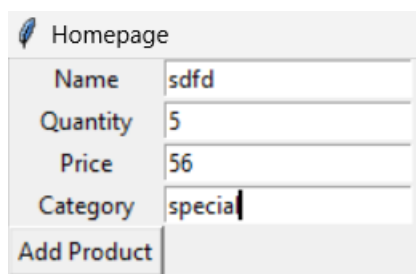
Students are required to write a python code which use Tkinter GUI platform to perform the following tasks

1. **User Authentication:** Implement a secure login system to authenticate users and restrict access to authorized personnel only. For example

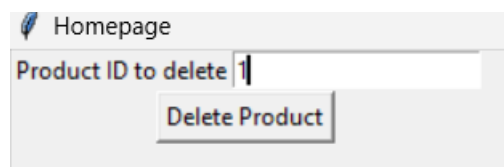


Inventory Management System	
Username	username
Password	*****
<input type="button" value="Login"/>	

2. **Product Management:** Provide functionalities to add, update, and delete products in the inventory database. Users can enter details such as product name, quantity, price, and category. For example



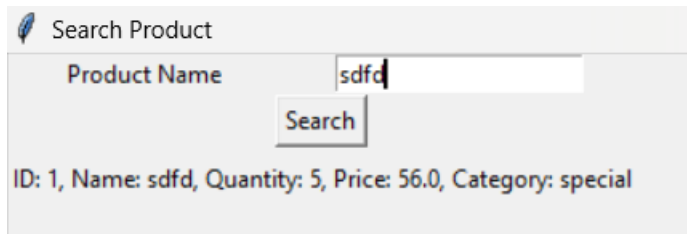
Homepage	
Name	sdfd
Quantity	5
Price	56
Category	special
<input type="button" value="Add Product"/>	



Homepage	
Product ID to delete	1
<input type="button" value="Delete Product"/>	

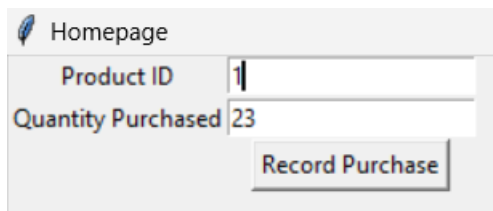
3. **Stock Tracking:** Enable real-time tracking of inventory levels by recording purchases, sales, and returns. The system should automatically update stock quantities and generate alerts for low stock items.

4. **Search and Filter:** Implement search and filter options to allow users to quickly find specific products based on various criteria such as name, category, or price range. For example

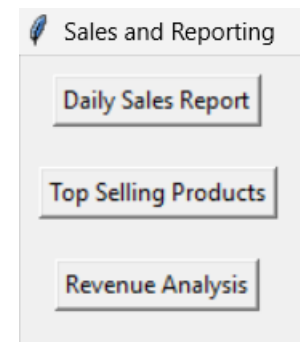


A screenshot of a 'Search Product' form. It features a text input field labeled 'Product Name' containing the text 'sdfd'. Below the input field is a 'Search' button. At the bottom of the form, the search results are displayed: 'ID: 1, Name: sdfd, Quantity: 5, Price: 56.0, Category: special'.

5. **Sales and Reporting:** Develop features to record sales transactions and generate comprehensive reports. Reports can include sales summaries, top-selling products, and revenue analysis for informed decision-making. For example



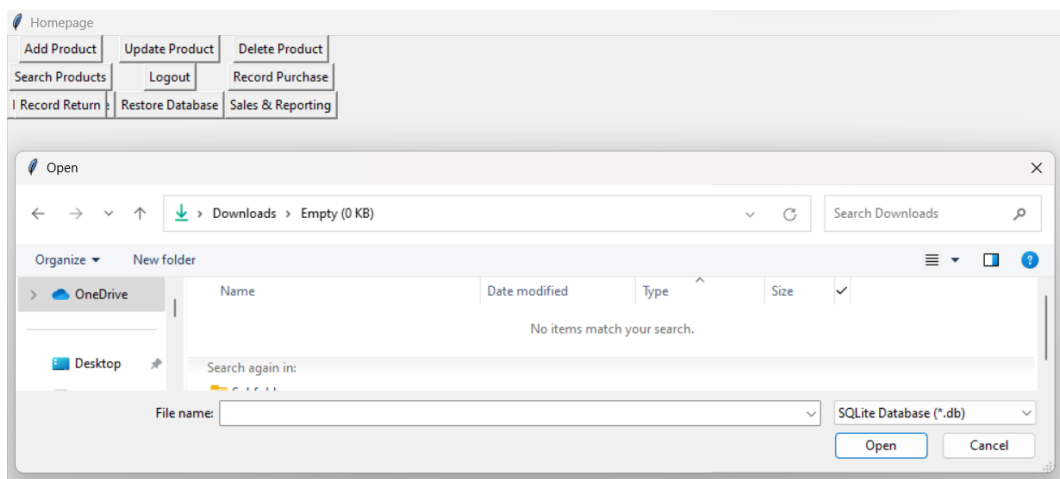
A screenshot of a 'Homepage' form. It contains two input fields: 'Product ID' with the value '1' and 'Quantity Purchased' with the value '23'. Below these fields is a 'Record Purchase' button.



A screenshot of a 'Sales and Reporting' menu. It contains three buttons: 'Daily Sales Report', 'Top Selling Products', and 'Revenue Analysis'.

6. **Notifications:** Incorporate notification mechanisms to alert users about low stock items, pending orders, or other important inventory-related updates.

7. **Data Backup and Restore:** Implement mechanisms to create backups of the inventory database and allow users to restore data in case of system failures or data loss. For example



A screenshot of a 'Homepage' interface with an 'Open' dialog box open. The homepage has a top navigation bar with buttons: 'Add Product', 'Update Product', 'Delete Product', 'Search Products', 'Logout', 'Record Purchase', 'Record Return', 'Restore Database', and 'Sales & Reporting'. The 'Open' dialog box shows the 'Downloads' folder, which is empty. The 'File name' field is empty, and the file type is set to 'SQLite Database (*.db)'. The 'Open' button is highlighted.

By completing these tasks, the Inventory Management System will provide users with a comprehensive solution for managing inventory efficiently, optimizing stock levels, and generating meaningful reports for informed decision-making.

Structure of the Technical Report

There should be 5 major headings in the report as given below

Introduction (5)

Explain Seaborn, Tkinter libraries, why GUI is important? Introduce in your own words the inventory management system that you have created and the functions of it.

Task-1 (10)

Screenshots of the outcomes from Python (Spyder), do not write source code in the report attached as a separate file as task1.py

Task-2 (10)

Screenshots of the outcomes from Python (Spyder), do not write source code in the report attached as a separate file as task2.py

Task-3 (15)

Screenshots of the outcomes from Python (Spyder), do not write source code in the report attached as a separate file as task3.py

Task-4 (35)

Screenshots of the outcomes from Python (Spyder), do not write source code in the report attached as a separate file as task4.py

***Note:** Create a zip file containing your Python source code files and submit it along with a separate PDF report. Ensure that both your code and report are original and do not match with other sources from the internet or fellow students. Minor instances of plagiarism related to Python syntax will not be considered. However, if the plagiarism percentage **exceeds 25%**, your assessment will undergo a thorough investigation, and it may result in a deduction of marks or even a failing grade.

In class Demonstration (25)

Each student is required to present their work in front of the class during week 11. This presentation should involve a demonstration of your technical work using a Python IDE. The following week, week 12, marks the submission deadline for your report. Failure to present your work as scheduled could result in a failing grade for the entire assessment.

ICT505 Assessment # 3 Marking Rubric Visualizing and Data Distribution by Python Based GUI Applications

Marking	F (Fail)	P (Pass)	C (Credit)	D (Distinction)	HD (High Distinction)
Criteria should add up to 100%	0-49%	50-64%	65-74%	75-84%	85-100%
Abstract/ Introduction /5	<i>Unsatisfactorily or unclearly conveys the Assessment topics.</i> <i>This is not relevant to the assignment topic.</i> <i>Unable to express the importance of the work.</i>	<i>Fairly conveys the assessment topics.</i> <i>Some relevance and briefly presented.</i> <i>Poor introduction of the project or poorly/partially describe the importance</i>	<i>Accurately conveys the project topics, methods.</i> <i>Generally relevant and analysed.</i>	<i>Accurately conveys the project topics, methods.</i> <i>Generally relevant and analysed.</i> <i>Provide the importance of the topics</i>	<i>Accurately Plus concisely conveys the project topics, methods, and outcomes.</i> <i>All topics are pertinent and covered in depth. Ability to think critically and source material is demonstrated.</i>
Task-1 /10	<i>Unable to design/develop/Implement a python code to read a CSV file provided.</i> <i>No outcomes of the Source code/ Source code is not provided.</i>	<i>Poorly implement the Python code to read a CSV file/Unable to read the data.</i> <i>No outcomes of the code/Source Code are provided but not executed.</i>	<i>Accurately implement the Python code to read a CSV file/able to read the data.</i> <i>Outcomes of the code/Source Code is provided and executed but required outcomes doesn't match with the objectives.</i>	<i>Accurately implement the Python code to read a CSV file/able to read the data.</i> <i>Outcomes of the code/Source Code is provided and executed with some limitations</i>	<i>Excellent commencement of all objectives, the Python code is provided to read a CSV file/able to read the data.</i> <i>Outcomes of the code/Source Code is provided and executed excellently.</i>

Task-2**/10**

Unable to test python-based algorithm/

Source Code is not provided, No discussion on the results.

Seaborn library is not used to create a box plot showing the distribution of data. Provided dataset is not utilised.

Poorly test python-based algorithm/

Source Code is not provided/ not working.

Seaborn library is not used/ used with errors to create a box plot showing the distribution of data. Provided dataset is not utilised/ Used different datasets. Results are vague.

Accurately perform testing on python-based algorithm/

Source Code is provided but working with bugs.

Seaborn library is used with errors to create a box plot showing the distribution of data. Provided dataset is utilised accurately.

Fulfil all the possible requirements of this task. Source Code is properly executed.

Seaborn library is used to create a box plot showing the distribution of data. Provided dataset is utilised accurately. The outcomes are matched with the requirements.

Excellent understanding and fulfil all the possible requirements of this task. Source Code is properly executed.

Seaborn library is used with proper understanding to create a box plot showing the distribution of data. Provided dataset is utilised excellently. The outcomes are matched with the requirements.

Task-3**/15**

Unable to test python-based algorithm/

Source Code is not provided, No discussion on the results. Geopandas library is not used, Unable to load shapefile containing geographic boundaries of a country or region.

Adequate cohesion and conviction to test python-based algorithm/ Source Code is provided but not executable.

Geopandas library is used with errors, Unable to load shapefile containing

Mostly consistent logical and convincing to test python-based algorithm/ Source Code is provided and executed with bugs. Geopandas library is used with errors, able to load shapefile containing geographic

Accurately tested python-based algorithm/ Source Code is provided and executed properly. Geopandas library is used with and able to load shapefile containing geographic boundaries of a

Excellent tested python-based algorithm/ Source Code is provided and executed Excellently. Geopandas library is used with and able to load shapefile containing geographic boundaries of a

*geographic boundaries
of a country or region.*

*boundaries of a
country or region*

*country or region.
Outcomes are good.*

*country or region.
Outcomes are good
with clear
understanding.*

Task-4
/35

*Unable to test python-
based algorithm/
Source Code is not
provided,*

*Tkinter library is not
used, Unable to
address the 7 sections
provided in the task-4
description.*

*Adequate cohesion
and conviction to test
python-based
algorithm/ Source
Code is provided but
not executable.
Tkinter library is not
used/ partially used, to
address the 7 sections
provided in the task-4
description. Outcomes
are not accurate.*

*Mostly consistent
logical and convincing
to test python-based
algorithm/ Source
Code is provided and
executed with bugs.
Tkinter library is used,
to address the 7
sections provided in
the task-4 description
but there are errors.
Outcomes are not
accurate/ partially
accurate.*

*Accurately tested
python-based
algorithm/ Source
Code is provided and
executed properly.
Tkinter library is used,
to address the 7
sections provided in
the task-4 description
Outcomes are
accurate and meets
the requirement of the
objectives.*

*Excellent tested
python-based
algorithm/ Source
Code is provided
and executed
Excellent.

Tkinter library is
used, to address the
7 sections provided
in the task-4
description
Outcomes are
excellent and meets
the requirement of
the objectives.
Outcomes are good
with clear
understanding.*

Demonstration /25	<i>Demonstration is confused and disjointed. Lack of knowledge about the Python working source code are not working/ presented. No knowledge of Python codes</i>	<i>Adequate cohesion and conviction. A poor knowledge about the design and the tasks, source code are not working properly/ executed with bugs.</i>	<i>Mostly consistent logical and convincing. The student shows a limited knowledge about the Python working, source code are executed with bugs. Partially executed.</i>	<i>Consistency logical and convincing. The student shows a good knowledge about the design implementation, and development process source codes are executed.</i>	<i>Logic is clear and easy to follow with strong arguments. The student shows a strong knowledge about the design implementation and excellent knowledge of the python codes.</i>
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Presentation Rubrics: 25 Marks

Criteria	Fail(0 – 49%)	Pass (50 – 64%)	Credit (65 –74%)	Distinction (75 -84%)	High Distinction (85 – 100%)
Visual appeal / 5	The source codes presented are difficult to read and contain too much text, poor choice of fonts and coolers, no or little visual appeal,	There are errors in spelling, grammar, and punctuation. Too much text on many slides. Minimal effort made to make slides appealing	There may be some errors in spelling, grammar, and punctuation. Too much text on two or more slides. Significant visual appeal.	There are no errors in spelling, grammar, and punctuation. Information is clear and concise on each slide. Visually appealing and engaging.	No errors, engaging and professional looking presentation. Excellent technical knowledge of the topics.

Content /15	The presentation provides a brief look at the topic but many questions are left unanswered. The majority of information is irrelevant and significant points. left out.	The presentation is informative but several elements are unanswered. Much of the information is irrelevant, coverage of some of major points.	The presentation is a good summary of the topic. Most important information covered; little irrelevant information.	The presentation is a concise summary of the topic with all questions answered. Comprehensive and complete coverage of information.	Exceptionally good summary of the topic and provides extensive supportive elements to aid the ease of understanding of the audience.
Presentation skills /5	Minimal eye contact focusing on small part of audience. The audience is not engaged. Spoke too quickly or quietly making it difficult to understand. Inappropriate/less-interested body language.	Focuses on only part of the audience. Sporadic eye contact and the audience is distracted. Speaker could be heard by only half of the audience. Body language is distracting.	Speaks to majority of the audience, steady eye contact. The audience is engaged by the presentation. Speaks at a suitable volume with some fidgeting.	Regular/constant eye contact, the audience is engaged, and presenter held the audience's attention. Appropriate speaking volume & body language.	Exceptionally Good presentation skills, excellent audience engagement.

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