D. Create a pair plot that showcases the relationship between every pair of attributes in the iris dataset (only seaborn library).

5. Create the visualizations of question 4 using plotly library.

DISCIPLINE SPECIFIC Elective - (DSE-2b) : Software Engineering

Semester 4

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE 02b Software Engineering	**4**	**3**	**0**	**1**	Pass in Class XII	**Knowledge of any programming Language**

Learning Objectives

The course introduces software development life cycle and software project management. It includes requirement engineering, software project planning, software design, software quality and software testing.

Learning Outcomes

On successful completion of the course, students will be able to:

- Understand and apply the software process models.
- Elicitate and analyse customer requirements and map requirements to design models.
- Estimate size, effort and cost required to build software.
- Identify risks involved in the software development and understand software quality.
- Design test cases to perform software testing.

SYLLABUS OF DSE 02b

Unit 1 (9 Hours)

Introduction Software Process, Software Characteristics, Changing nature of Software, Role of Management in Software Development; Software Life Cycle Models- Waterfall Model, Incremental Process Model, Prototyping Model, and Spiral Model; Introduction to Agile development.

Unit 2 (6 Hours)

Requirement Engineering: Crucial Process steps, Types of Requirements, Requirement Elicitation, Requirement Analysis, Requirement Documentation, Requirement Validation.

Unit 3 (7 Hours)

Software Project Planning: Size Estimation – Lines of code, Function points; Cost estimation using Constructive Cost Model (COCOMO model), Software Risk Management, Project Scheduling (Gantt Chart).

Unit 4 (8 Hours)

Software Design: Conceptual and Technical Design, Objectives of Design, Module Coupling and Cohesion, Strategy of Design, Function-oriented Design

Unit 5 (5 Hours)

Software Quality: Quality Attributes, McCall Software Quality Model, Capability Maturity Model (CMM), Software Reliability.

Unit 6 (10 Hours)

Software Testing: Error, Fault and Failure, Functional Testing- Boundary Value Analysis, Equivalence Class Testing; Structural Testing- Path Testing, Cyclomatic Complexity; Levels of Testing, Validation Testing.

Essential/recommended readings

1. RS Pressman, BR Maxim, Software Engineering: A Practitioner's Approach, 8th Edition, McGraw-Hill, 2015.

2. K.K Aggarwal, Yogesh Singh, Software Engineering, 3rd Edition, New Age International Publishers, 2007

Additional References

1. Ken Schwaber, Jeff Sutherland, The Definitive Guide to Scrum: The Rules of the Game, July 2016. [https://www.scrumguides.org/docs/scrumguide/v1/scrum-guide-us.pdf]
2. I Sommerville, Software Engineering, 9th edition, Addison Wesley, 2011.
3. P Jalote, An Integrated Approach to Software Engineering, 3rd Edition, Narosa Publishing House, 2005.

Suggestive Practice Questions:

Create a project report that includes the following –

1. Define Problem Statement for the project and identify process model.
2. Requirement Elicitation, Requirement Analysis: Data Modelling, Software Requirement Specification Document.
3. Project Management: Compute Function Point, Effort, Cost, Risk Identification, Gantt Chart.
4. Software Design: Structured Chart, Pseudocode of a small module.
5. Coding: Develop at least a single module using any programming Language.
6. Testing: Compute Cyclomatic Complexity for the coded module, and generate test cases.

Some of the Sample Projects are given below though they are not limited to this.

1. College Canteen Automation System
2. Online Car-Pooling System
3. Patient Appointment System
4. Medical Prescription Processing System
5. Online Shopping Management System
6. Online Hotel Reservation Service System
7. Online Movie Booking System
8. Online Examination and Result computation System
9. Automatic Internal Assessment System
10. Complaint Ticket Management System