



# CSE-CSIT

## TUTORIAL WORKBOOK

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# **TUTORIAL WORKBOOK**

STUDENT NAME	
REG. NO	
YEAR	
SEMESTER	
SECTION	
FACULTY	

Vision:

To be a leader in Information Technology education and research, driving innovation in emerging technologies and empowering students to develop ethical, sustainable, and impactful IT solutions for a digitally connected world.

Mission:

- ❖ To provide high-quality, tool-based hands-on education that integrates theory with industry-driven learning.
- ❖ To foster a research ecosystem that promotes innovation and practical applications in IT.
- ❖ To equip students with leadership skills, entrepreneurship mindset, and interdisciplinary adaptability.
- ❖ To instill ethical and responsible computing practices in emerging domains.
- ❖ To prepare graduates to excel in the IT industry with technical expertise and continuous learning.

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### Organization of the Student Lab Workbook

The laboratory framework includes a creative element but shifts the time-intensive aspects outside of the Two-Hour closed laboratory period. Within this structure, each laboratory includes two parts: Pre lab and In-lab.

#### a. Pre-Lab

The Pre-Lab exercise is a homework assignment that links the lecture with the laboratory period - typically takes 2 hours to complete. The goal is to synthesize the information they learn in lecture with material from their textbook to produce a working piece of software.

Pre-Lab Students attending a two-hour closed laboratory are expected to make a good faith effort to complete the Prelab exercise before coming to the lab. Their work need not be perfect, but their effort must be real (roughly 80 percent correct).

#### b. In-Lab

The In-Lab section takes place during the actual laboratory period. The First hour of the laboratory period can be used to resolve any problems the students might have experienced in completing the Prelab exercises. The intent is to give constructive feedback so that students leave the lab with working Prelab software - a significant accomplishment on their part. During the second hour, students complete the In-lab exercise to reinforce the concepts learned in the Prelab. Students leave the lab having received feedback on their Prelab and In-lab work.

#### c. Post-Lab

Once the student completes the pre and in lab sessions, the teacher should give some home work/assignment based on his/her work of the day, mainly projecting Project based assignment. Student should submit his/her completed work in coming lab session.

**23CI2001 ADAPTIVE SOFTWARE ENGINEERING****2025-26 ODD SEMESTER TUTORIAL CONTINUOUS EVALUATION**

S.No	Date	Experiment Name				Viva Voce (5M)	Total (50M)	Faculty Signature
			Writeup (15)	Execution (15)	Results (15)			
1								
2								
3								
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10								
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## 23CI2001 ADAPTIVE SOFTWARE ENGINEERING

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## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE CODE: 23CI2001

## ADAPTIVE SOFTWARE ENGINEERING TUTORIAL WORKBOOK

Date of the Session: / /

Time of the Session: to

**Name of the Tutorial #1,** How to use Star UML and How to draw Use Case, Class, Sequence, Activity and State chart diagram by using star UML

**Prerequisite:**

- Software Engineering Methodologies.
- Download Star UML.
- Basics of Software Engineering.

**1. UML Full form**

- Uniform modeling Line
- unified modeling language
- Unilateral modeling language
- Unified Modeling Line

**Answer:****2. Which of the following UML diagrams has a static view?**

- Collaboration
- Use case
- State chart
- Activity

**Answer:****3. What type of core-relationship is represented by the symbol in the figure below?**

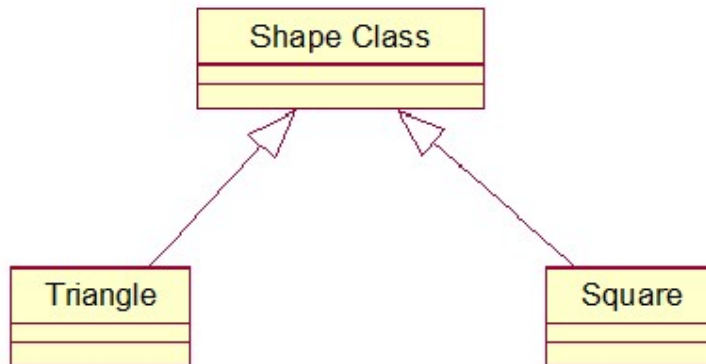
- Aggregation
- Dependency
- Generalization
- Association

**Answer:**

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4. What type of relationship is represented by Shape class and Square ?



- a) Realization
- b) Generalization
- c) Aggregation
- d) Dependency

**Answer:**

1. Detail the Steps involved in downloading Star UML: Name of the software: Star UML, Version: 2.8.0(<http://staruml.io/download>).

2. After downloading details how to open the software

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**3. Explain five windows in the interface of Star UML**

**4. Steps for drawing a use case diagram:**

**5. Steps for drawing activity diagram:**

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**6. Steps for drawing a class diagram****7. Steps for drawing Sequence Diagram****8. Steps for drawing State Chart Diagram***(For Evaluator's use only)*

<u>Comment of the Evaluator (if Any)</u>	<u>Evaluator's Observation</u>
	Marks Secured:_____out of
	_____Full Name of the
	Evaluator:_____
Signature of the Evaluator Date of Evaluation:	

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**Name of the Tutorial #2** Draw Use case, Class, Sequence, Activity and State chart Diagram for Library Management System (LMS) by using star UML

**Prerequisite:**

- **Software Engineering Methodologies.**
- **Download Star UML.**
- **Basics of Software Engineering.**

**1. Define Modeling in UML and its advantages?**

Ans: -

**2. What do you understand by intend and extend relationships in use case diagrams?**

Ans: -

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**3. What is the difference between data model and an entity relationship diagram?**

Ans: -

**4. What is the difference between functional and non-functional requirements?**

Ans:-

### Library Management Case Study

The library management system project is related to the storage of information regarding the library. Library is the place with the huge collection of books. It is a place where the students and the faculties issue the books for their reference purposes. But the maintenance of keeping the records of issuing and borrowing is difficult if you use a normal book as a registry. To make this task easier, the library management system will be very useful. It helps in maintaining the information regarding the issuing and borrowing of books by the students and the faculties. The library management system case study gives the case study of the library management system

**Writing space for the Problem:(For Student's use only)**

### Use case diagram for LMS

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**Writing space for the Problem:(For Student's use only)**

**Class diagram for LMS**

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**Sequence diagram for LMS**

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**Writing space for the Problem:(For Student's use only)**

**Activity Diagram for LMS**

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**Writing space for the Problem:(For Student's use only)**

**State Chart Diagram for LMS**

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Draw all diagrams for the Word processor case study

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**Writing space for the Problem:(For Student's use only)****Viva Questions**

1. How many diagrams are here in Unified Modelling Language?

- a) six
- b) seven
- c) eight
- d) nine

**Answer:**

2. Use case descriptions consist of interaction\_\_\_\_\_?

- a) Use case
- b) product
- c) Actor
- d) Product & Actor

**Answer:**

3. Which of these statements are truly acceptable?

- a) A precondition is an assertion guaranteed to be true when the operation finishes
- b) A post-condition is an assertion guaranteed to be true when the activity or operation begins
- c) An event which causes a use case to begin is trigger
- d) None of the mentioned

**Answer:**

4. What are the types of prototypes?

- a) Horizontal prototypes
- b) Vertical Prototypes
- c) All of the mentioned
- d) None of the mentioned

**Answer:**

5. Diagrams which are used to distribute files, libraries, and tables across topology of hardware are called

- A. deployment diagrams
- B. use case diagrams
- C. sequence diagrams
- D. collaboration diagrams

**Answer:***(For Evaluator's use only)*

<u>Comment of the Evaluator (if Any)</u>	<u>Evaluator's Observation</u>
	Marks Secured:                      out of
	Full Name of the Evaluator:
	Signature of the Evaluator Date of Evaluation:

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**Name of the Tutorial #3** Draw Use case, Class, Sequence, Activity and State Chart Diagram for Admission process.

**Prerequisite:**

- **Software Engineering Methodologies.**
- **Download Star UML.**
- **Basics of Software Engineering.**

**1. How many views of the software can be represented through the Unified Modeling Language (UML)?**

- Four
- Five
- Nine
- None of the above

**Answer:**

**2. Which of the following views represents the interaction of the user with the software but tells nothing about the internal working of the software?**

- Use case diagram
- Activity diagram
- Class diagram
- All of the above

**Answer:**

**3. What are the notations for the Use case Diagrams?**

- Use case
- Actor
- Prototype
- Use case and Actor

**Answer:**

**4. Which among the following can be heuristic for Use case diagram?**

- The product can be made actor
- Never name actors with noun phrases
- Name Use cases with verb phrases
- All of the mentioned

**Answer:**

**5. Which of the following statements is true?**

- There are 5 views that are represented through the Unified Modelling Language (UML).
  - These 5 views in UML are represented through 9 UML diagrams.
- a. Only i is true

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- b. Only ii is true  
c. Both i and ii are true  
d. None of them is true

**Answer:**

#### University Admission Process

Eligibility Criteria for B.Tech Admission. Admissions will be made for B.Tech Programme by the following criteria. Candidates have to be successful in Entrance Examination)/ **JEE-Main/ JEE-Advanced** / State Level Engineering Entrance Exams across India including EAMCET and Merit in Sports/Cultural Activities. University accepts Uni-GAUGE score for B.Tech admissions. Eligibility:

- Pass in 10+2 or equivalent examination with 60% and above in aggregate and 60% and above in Group subjects.
- Students with Physics, Chemistry and Mathematics (PCM) are eligible for all B.Tech programmes including Biotechnology.
- Students with Physics, Chemistry and Biology (PCB) are eligible for B.Tech (Biotechnology) and B. Pharmacy.

#### Use Case Diagram for University Admission Process

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**Class diagram for University Admission Process:**

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**Sequence Diagram for University Admission Process**

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**Activity Diagram for University Admission Process**

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**State Chart Diagram for University Admission Process**

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**Draw all diagrams for the case study Railway Reservation System**



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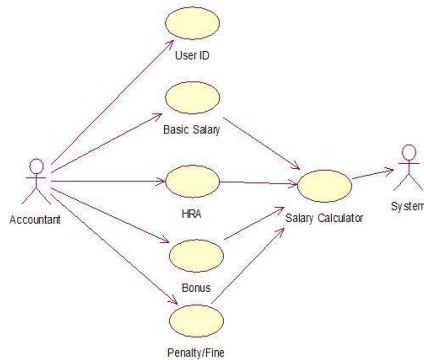
**23CI2001 ADAPTIVE SOFTWARE ENGINEERING**

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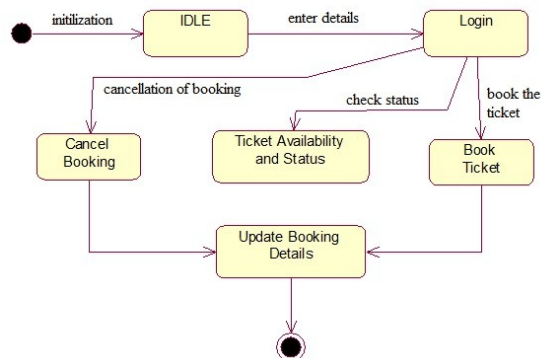
**Writing space for the Problem:(For Student's use only)**

**Viva Questions****1. How many diagrams are here in Unified Modelling Language?**

- a) six
- b) seven
- c) eight
- d) nine

**Answer:****2. Which UML diagram is shown below?**

- a) Use Case
- b) Collaboration Diagram
- c) Class Diagram
- d) Object Diagram

**Answer:****3. Which UML diagram is shown below?**

- a) Use Case
- b) State Chart
- c) Activity
- d) Object Diagram

**Answer:**

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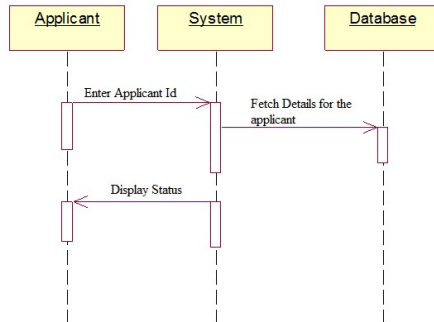
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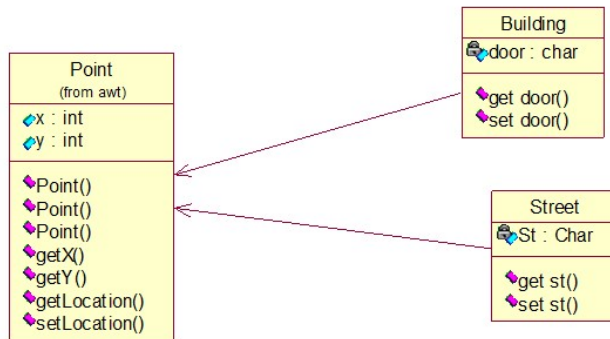
4. Which UML diagram is shown below?



- a) Use Case
- b) Collaboration Diagram
- c) Sequence Diagram
- d) Object Diagram

**Answer:**

5. Which UML diagram is shown below?



- a) Deployment diagram
- b) Collaboration Diagram
- c) Object Diagram
- d) Class Diagram

**Answer:**

*(For Evaluator's use only)*

<u>Comment of the Evaluator (if Any)</u>	<u>Evaluator's Observation</u>
	Marks Secured:                      out of
	Full Name of the
	evaluator:
	Signature of the Evaluator Date of Evaluation:

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**Time of the Session:**        to

**Name of the Tutorial #4** Draw Use case, Class, Sequence, Activity and State chart diagram for Online bank ATM by using star UML

**Prerequisite:**

- **Software Engineering Methodologies.**
- **Download Star UML.**
- **Basics of Software Engineering.**

**1. UML diagram that specifies sequences/ steps of operations to be performed**

- A. Activity diagram
- B. Use case diagram
- C. Class diagram
- D. E-R case diagram

**Answer:**

**2. Which of the following statements are true?**

- a) Use case diagram is a dynamic model of interaction between actors and product in a use case
- b) Use case Description is a static model of use case supported by a product
- c) All of the mentioned
- d) None of the mentioned

**Answer:**

**3. A UML diagram that facilitates requirements gathering and interacts between system and external users, is called as**

- A. Flowchart diagram
- B. Sequence diagram
- C. Use case diagram
- D. Data flow diagram

**Answer:**

**4. Who considers diagrams as a type of Class diagram, component diagram, object diagram, and deployment diagram?**

- A) structural
- B) behavioral
- C) non-behavioral
- D) non-structural

**Answer:**

**5. \_\_\_\_\_ represented by In UML diagrams, relationship between component parts and object.**

- A) ordination
- B) aggregation
- C) segregation
- D) increment

**Answer:**

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**Online Bank ATM**

An automated teller machine (**ATM**) or the automatic banking machine (**ABM**) is a banking subsystem (subject) that provides bank customers with access to financial transactions in a public space without the need for a cashier, clerk, or bank teller.

Customer (actor) uses bank ATM to Check Balances of his/her bank accounts, Deposit Funds, Withdraw Cash and/or Transfer Funds (use cases). ATM Technician provides Maintenance and Repairs. All these use cases also involve Bank actor whether it is related to customer transactions or to the ATM servicing.

**Use Case Diagram for Online Bank ATM**

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**Class diagram for Online Bank ATM**

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**Sequence diagram for Online ATM**

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**State chart diagram for Online ATM**

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**Activity Diagram for Online ATM**

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**Draw all diagrams for the case study Hospital Management System**

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## 23CI2001 ADAPTIVE SOFTWARE ENGINEERING

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**Viva Questions**

**1. Which types they considered Activity diagram, use case diagram, collaboration diagram, and sequence diagram as?**

- A) non-behavioral
- B) non-structural
- C) structural
- D) behavioral

**Answer:**

**2. Which diagram is used to show interactions between messages are classified as?**

- A) activity
- B) state chart
- C) collaboration
- D) object lifeline

**Answer:**

**3. Which diagrams are used to distribute files, libraries, and tables across topology of the hardware**

- A) deployment
- B) use case
- C) sequence
- D) collaboration

**Answer:**

**4. Which diagram that helps to show Dynamic aspects related to a system?**

- A) sequence
- B) interaction
- C) deployment
- D) use case

**Answer:**

**5. Simple name in UML Class and objects consist of \_\_\_\_\_.**

- A) Letters
- B) Digits
- C) Punctuation Characters
- D) All of the mentioned

**Answer:**

*(For Evaluator's use only)*

<u>Comment of the Evaluator (if Any)</u>	<u>Evaluator's Observation</u>
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**Name of the Tutorial #5** Create a scrum project of 5 members (Team Managed project) for the following issue. Draw the workflows for the same.

A customer wants to pay the bill online (EPIC).

**Prerequisite:**

- **Software Engineering Methodologies.**
- **GitHub for Scrum.**
- **Basics of Software Engineering.**

Create EPIC, user stories issues and assign the same to team members. Monitor the workflow in progress and prioritize and schedule the work. Track the schedule, update it. Finally generate the reports and metrics for the entire work.

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*(For Evaluator's use only)*

<u>Comment of the Evaluator (if Any)</u>	<u>Evaluator's Observation</u>
	Marks Secured:                      out of  Full Name of the  Evaluator:  Signature of the Evaluator Date of Evaluation:

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**Date of the Session:**    /        /

**Time of the Session:**        to

**Name of the Tutorial #6** Create a scrum project and explore different templates available.

**Prerequisite:**

- Account signup in ATLASIAN.com
- GitHub for Scrum.
- Basics of Software Engineering

Set Up the Project in Jira, Create the Product Backlog, Create Sprints and Add User Stories, Conduct Sprint Planning, Monitor Sprint Progress and Update the Sprint Board.

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**Writing space for the Problem:(For Student's use only)**

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	Marks Secured:                      out of  Full Name of the  Evaluator:  Signature of the Evaluator Date of Evaluation:

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**Name of the Tutorial #7** Navigate into the project created and create a report on the same.

**Prerequisite:**

- **Account signup in ATLASIAN.com**
- **GitHub for Scrum.**
- **Basics of Software Engineering.**

Use Jira's reporting features to generate sprint reports, including burndown charts and velocity charts. Analyze the charts to track progress, identify any deviations from the planned sprint, and adjust future sprints if needed.

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Name of the Tutorial # 8 Create a dashboard in Jira by following Hints given:

- In the top navigation, click the Dashboards dropdown and select Create dashboard.
- Give your dashboard a name and description. Add viewers and editors as necessary.
- Click Add gadget in the top-right. Search for and add the gadget that best suits your needs.
- (Optional) Update the layout of the dashboard by selecting Change layout in the top-right.
- (Optional) Drag and drop gadgets to organize information.
- Select Done in the top-right when you're happy with the dashboard.

**Prerequisite:**

- **Account signup in ATLASIAN.com**
- **GitHub for Scrum.**
- **Basics of Software Engineering.**

Create Dashboard giving a descriptive name and select appropriate permissions for sharing settings. Add gadgets to dashboard (e.g., Burndown Chart, Pie Chart, Issue Statistics). Also share the dashboard among team members in the project.

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**Name of the Tutorial #9** Working on the Project with given case study using Agile Development scrum model in GitHub

**Prerequisite:**

- **Software Engineering Methodologies.**
- **GitHub for Scrum.**
- **Basics of Software Engineering.**

**CASE STUDY: TRANSPORT DEPARTMENT**

Transport Department, Government of Andhra Pradesh is providing various services to citizens of the state. Each district of a state having two or three RTO (Regional transport offices) will be available. These offices are headed by the RTO (Regional Transport Officer). Each office contains various types of designated employees working under him. They will look after the following services.

**New License:** The citizens who have a minimum age of 18 years may approach to respective RTO based on the address for getting a license to drive a vehicle. They need to produce various documents like Photo identity and address proof for applying a new license. Aadhar card number is mandatory for getting license. Initially the RTO will provide learner license for the period of 30 days. There are two types of license will be provided. For non-transport vehicles (two-wheeler, four-wheeler), transport vehicles (three-wheeler, four-wheeler, heavy vehicles etc). During 30 days period the person can learn driving and traffic rules. RTO will be conducted driving test and online test and it will be monitored by officer. After passing tests, a person will get a valid license for a particular duration based on their age. The license contains license number, name, father name/husband name, address, issue date, issued authority, type of license, validity, date of birth, blood group will be recorded. The rules will be changed from time to time.

**Renewal of license:** Renewal of license will be done from one month before expiry date and up to 15 days of expiry. He/She needs to follow the same rules and regulations stated in the above paragraph. The change of address candidates can approach the area office for renewal.

**Vehicle registration:** The RTO is offering another service for registration of new vehicles at

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dealer's location. No need to rush to RTO office for vehicle registration. Initially, the dealer will register organization details (Dealership name, authorized to sell what class of vehicles, dealer license, address, duration of license) at the transport office for registering new vehicles. The dealer will verify the details of the customer; collect all documents (address, identity proof and Aadhar card is compulsory), required road tax for registering new vehicles without visiting RTO office. There will be a new rule also imposed

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against citizens, those who have one vehicle with his/her name, he/she needs to apply additional tax to the Government. After registration of the vehicle Regd No, Owner Name, father/husband name, address, class of vehicle, manufacturing date, fuel used, type of body, chassis number, engine number, date of registration, valid up to, tax paid etc.).

**Change of ownership of vehicles:** Buyer of the vehicle can approach RTO office with existing documents and transfer deed.

**Contract permits:** The RTO will provide contract permits for transport vehicles from one place to another place. The owner of a transport vehicle needs to apply for a contract permit for a specific number of days. The owner of the vehicle needs to pay the amount per seat. All the transport vehicles need to apply for a fitness test. During this test the RTO will verify the entire vehicle, if the vehicle is suitable for transport, they will give a fitness certificate.

**Educational Institution:** RTO will provide permits for vehicles of educational institutions. They need to pay less for fitness compared to contract vehicles and it is valid for one academic year. These vehicles will be permitted to carry students from their house to education institutions. These vehicles may not be permitted for other purposes. Violation of any of the transport rules, the vehicle owner/driver will be imposed a fine/any other punishment as per the government rules.

Create user stories, issues, milestones for the above case study using scrum methods and upload the project in GitHub.

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**Name of the Tutorial #10** Working on the Project with given case study using Agile Development scrum model in GitHub

**Prerequisite:**

- **Software Engineering Methodologies.**
- **GitHub for Scrum.**
- **Basics of Software Engineering.**

**CASE STUDY: AGRICULTURE& AQUACULTURE SYSTEMS(AAS)**

The state Government wants to maintain the database of all the farmers and their agricultural land details like survey number, total land in hectares, Village name, usage i.e., agriculture or aquaculture. State Government officials, bank people, farmers, and guests are users of the portal. They can register and view the details. Banks will be provided loans for their cultivation with one year duration based on their land size and their cultivation type. Once farmer gets the loan, bank people will update the details of their loan in the state government portal. This will help those who want to buy land from existing farmer. Based on clearance of the loan any one can buy land from existing farmer. The new farmer details have to update in the portal. Bank also can give loan based on the existing status. Government officials can modify the details of new farmer and bank people can update the loan status. The farmers can view only reports. All the farmers' need not take loan compulsory.

Based on type of agriculture and aquaculture, the people of agriculture department of state Government will provide all necessary help to the farmers. Farmers can get the pesticide details from the agriculture department for their cultivation and aquaculture.

After crop is ready the government will purchase from the farmers, the amount will be returned to the bank. Government may also transfer money for any subsidy/insurance amount to Aadhar linked bank account.

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Create user stories, issues, milestones for the above case study using scrum methods and upload the project in GitHub.

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**Name of the Tutorial #11** Working on the Project with given case study using Agile Development scrum model in GitHub

**Prerequisite:**

- **Software Engineering Methodologies.**
- **GitHub for Scrum.**
- **Basics of Software Engineering.**

**CASE STUDY: KL UNIVERSITY ERP**

KL University is offering various Engineering, Management, Humanities and Science courses to the students. University management planned to use online software for entire course management. The objective of the software is to share online resources among faculty and student community. There are different user roles to be defined by KLU management. The roles are Administrator, Officer, Faculty and student. The administrator is whole responsible person for smooth running of entire system. The administrator will create a user name and password to the other roles of the users by giving all the details of user. The Officer role is to generate reports including the student status, course additions and deletions etc.

Initially the admitted student has to register with his/her details in the system. Upon registration in the system student can approach for registration of courses in the current semester. The student will register specific number courses by choosing course and faculty name. After registration, the student will able to view the time table, attendance and course material shared by concerned faculty members. Student can view fee details in the current semester and previous semesters. He/She can also view regular attendance for every course.

The student can take the books from library on loan basis. Student can view the status of library books and other details like due date, fines etc. The student can also view the list of books available in library.

The student can register for hostel facility. Hostel authority will verify the details of the student, may approve his/her hostel seat depending on various parameters (discipline, academic

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performance etc.). Once allotment is done student can view the fee dues.

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Create user stories, issues, milestones for the above case study using scrum methods and upload the project in GitHub.

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**Name of the Tutorial #12** Working on the Project with given case study using Agile Development scrum model in GitHub

**Prerequisite:**

- **Software Engineering Methodologies.**
- **GitHub for Scrum.**
- **Basics of Software Engineering.**

**CASE STUDY: POLLUTION ANALYSIS**

Central Government wants to analyze the pollution from land transportation vehicles. So, they've approached you and asked you to analyze the transport vehicles' contribution to the pollution. They would like you to create an application which provides information about the vehicles in each state.

People of the country may use 2, 3, 4 wheelers for travelling daily. People can have one or more vehicles from different companies. These companies have different prices for each type of vehicle. Based on the vehicle type, the pollution ejecting value changes. Government will fix a certain range for each type of vehicle. Pollution testing centres have to verify the pollution of vehicle and record the same. The pollution testing centre has to advise for service of vehicle in certain duration of time for getting pollution certificate.

Also, there is a limited time period (Maximum 15 years) for which a particular type of vehicle can be used before it becomes harmful for the environment. For recycled motors, this time period could be very less. These recycled vehicles also have exceptional pollution ejecting values which makes their life time lower. This parameter can also be taken into account while doing the analysis.

Create user stories, issues, milestones for the above case study using scrum methods and upload the project in GitHub.

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