 **SRM INSTITUTE OF SCIENCE AND TECHNOLOGY RAMAPURAM CAMPUS, CHENNAI-89**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING 18CSC202J-OBJECT ORIENTED DESIGN AND PROGRAMMING**

**QUESTION BANK**

**UNIT 1**

**Refer PART – A & 12 Marks Questions from “18CS202J-OODP Question bank All Units” (File)**

**PART- B (4 Marks)**

1. Compare and contrast abstract classes and interfaces

[Difference between Abstract class and Interface](https://www.javatpoint.com/difference-between-abstract-class-and-interface)

2. How can we prevent a class from instantiation?

[Prevent instantiation of base class that is not polymorphic c++](https://stackoverflow.com/questions/31537002/prevent-instantiation-of-base-class-that-is-not-polymorphic-c/31537043)

[Few Ways to Prevent Instantiation of Class](https://www.c-sharpcorner.com/UploadFile/97fc7a/few-ways-to-prevent-instantiation-of-class/)

3. Construct Use-case diagram for an Online Shopping Application

[use case diagram for online shopping](https://meeraacademy.com/use-case-diagram-for-online-shopping/)

[Online shopping UML examples - use cases, checkout, payment, credit card processing, activities, deployment.](https://www.uml-diagrams.org/examples/online-shopping-example.html)

<https://www.uml-diagrams.org/examples/online-shopping-use-case-diagram-example.html>

4. With the help of a neat sketch, explain the Object Oriented Software Development Life cycle model.

[Software Engineering | Object-oriented Life Cycle Model](https://www.geeksforgeeks.org/software-engineering-object-oriented-life-cycle-model/)

[Object-oriented Life Cycle Model in Software Engineering](https://www.tutorialspoint.com/object-oriented-life-cycle-model-in-software-engineering)

[OOAD - Object Oriented System](https://www.tutorialspoint.com/object_oriented_analysis_design/ooad_object_oriented_system.htm)

5. List out the difference between procedure oriented programming & Object oriented programming. (CLA1-L1)

[Differences between Procedural and Object Oriented Programming](https://www.geeksforgeeks.org/differences-between-procedural-and-object-oriented-programming/#:~:text=In%20procedural%20programming%2C%20program%20is,into%20small%20parts%20called%20objects.&text=Object%20oriented%20programming%20provides%20data,programming%2C%20overloading%20is%20not%20possible)

[Difference between procedural programming and object-oriented programming - javatpoint](https://www.javatpoint.com/procedural-programming-vs-object-oriented-programming)

6. Write syntax of class, objects and methods and explain with example. (CLA1-L1)

[C++ Class and Object with Example](https://www.guru99.com/cpp-classes-objects.html)

[C++ Classes and Objects](https://www.geeksforgeeks.org/c-classes-and-objects/)

7. Differentiate public and private functions with an example. (CLA1-L2)

[Difference between Public and Private in C++ with Example](https://www.geeksforgeeks.org/difference-between-public-and-private-in-c-with-example/)

8. Give example for static keyword and explain. (CLA1-L2)

[Static Keyword in C++](https://www.geeksforgeeks.org/static-keyword-cpp/)

[C++ Static Keyword: Static Variables, Methods and Objects](https://www.studytonight.com/cpp/static-keyword.php)

[Static Keyword in C++](https://www.tutorialspoint.com/static-keyword-in-cplusplus)

9. Write a C++ program to generate factorial of a number using class (CLA1-L3)

[C++ Program to find Factorial of a number using class](https://www.codezclub.com/cpp-find-factorial-defining-functions-outside-class/)

10. Write an example program to demonstrate type conversions and explain.(CLA1-L3)

[Type Conversion in C++](https://www.geeksforgeeks.org/type-conversion-in-c/)

[Introduction to C++ Type Conversion | Engineering Education (EngEd) Program](https://www.section.io/engineering-education/intro-to-c++-type-conversion/#c++-type-conversion)

[C++ Type Conversion](https://www.programiz.com/cpp-programming/type-conversion)

11. List the features of OOPS and explain. (CLA1-L1)

[Object Oriented Programming in C++](https://www.geeksforgeeks.org/object-oriented-programming-in-cpp/)

12. Write the drawbacks in procedural oriented programming. (CLA1-L1)

[What is Procedural Programming? [Definition] - Key Features](https://hackr.io/blog/procedural-programming)

13. Differentiate class and objects with example. (CLA1-L2)

[Difference between Class and Object](https://www.geeksforgeeks.org/difference-between-class-and-object/)

14. Give an example for pointer and explain. (CLA1-L2)

[C++ Pointers](https://www.tutorialspoint.com/cplusplus/cpp_pointers.htm)

<https://www.geeksforgeeks.org/pointers-c-examples/>

15. Write a C++ program to generate Fibonacci series using class (CLA1-L3)

[C++ class for generate Fibonacci series - C++ Articles](https://www.cplusplus.com/articles/LT75fSEw/)

[C++ Program to print Fibonacci Series using Class template](https://www.geeksforgeeks.org/c-program-to-print-fibonacci-series-using-class-template/)

16. Write an example program to demonstrate casting (CLA1-L3)

<https://www.geeksforgeeks.org/type-conversion-in-c/>

<https://www.educba.com/type-casting-in-c-plus-plus/>

17. Illustrate the relationship used in Use case.

[Use Case Diagram Relationships Explained with Examples](https://creately.com/blog/diagrams/use-case-diagram-relationships/)

[Relationships between Use Cases](http://www.cs.sjsu.edu/faculty/pearce/modules/lectures/ooa/requirements/relations.htm)

[Use Case Relationships](https://www.w3computing.com/systemsanalysis/use-case-relationships/)

18. What is UML? List out the UML Diagrams

[UML Diagram Types | Learn About All 14 Types of UML Diagrams](https://creately.com/blog/diagrams/uml-diagram-types-examples/)

[UML - Standard Diagrams](https://www.tutorialspoint.com/uml/uml_standard_diagrams.htm)

19. Compare Include and Extend use case relationships.

[UML use case include relationship shows that behavior of the included use case is inserted into the behavior of the including use case.](https://www.uml-diagrams.org/use-case-include.html)

[What's is the difference between include and extend in use case diagram?](https://courses.cs.ut.ee/MTAT.03.083/2015_fall/uploads/Main/ExtendInclude.pdf)

[What's is the difference between include and extend in use case diagram?](https://stackoverflow.com/questions/1696927/whats-is-the-difference-between-include-and-extend-in-use-case-diagram)

20. When to use class diagram?

[When to Use Class Diagrams :: Chapter 4. Class Diagrams: The Essentials :: UML :: Programming](http://etutorials.org/Programming/UML/Chapter+4.+Class+Diagrams+The+Essentials/When+to+Use+Class+Diagrams/)

[UML - Class Diagram](https://www.tutorialspoint.com/uml/uml_class_diagram.htm)

[What is a class diagram? - Knowledge Base](https://www.microtool.de/en/knowledge-base/what-is-a-class-diagram/)

21. Explain the terms: Polymorphism and Encapsulation

[Understanding Encapsulation, Inheritance, Polymorphism, Abstraction in OOPs](https://www.geeksforgeeks.org/understanding-encapsulation-inheritance-polymorphism-abstraction-in-oops/)

[Polymorphism, Encapsulation, Data Abstraction and Inheritance in Object-Oriented Programming](https://www.nerd.vision/post/polymorphism-encapsulation-data-abstraction-and-inheritance-in-object-oriented-programming)

22. Consider a Banking System. Identify three entities in the system which can be represented using classes and show the relationship between them using UML class diagrams

[UML CLASS DIAGRAM EXAMPLE. Now, let's take what we've learned in… | by Salma](https://medium.com/@smagid_allThings/uml-class-diagram-example-fab6197200e6)

[OOAD - UML Structured Diagrams](https://www.tutorialspoint.com/object_oriented_analysis_design/ooad_uml_structural_diagrams.htm)

[Bank System | Banking System | Class UML Diagram for Bank Account System | Bank System](https://www.conceptdraw.com/examples/bank-system)

23. Explain how objects are passed as function parameters with a suitable example.

[Objects as Function Arguments in c++](https://ecomputernotes.com/cpp/classes-in-c/objects-as-function-arguments)

[Object as an argument in C++ with example - IncludeHelp](https://www.includehelp.com/cpp-tutorial/object-as-an-argument-in-cpp-with-example.aspx)

[Passing and Returning Objects in C++](https://www.geeksforgeeks.org/passing-and-returning-objects-in-c/)

24. What is a constructor? What are its uses?

[C++ Constructors: Types and Copy Constructors](https://www.programiz.com/cpp-programming/constructors)

[Constructors in C++](https://www.geeksforgeeks.org/constructors-c/)

[Introduction to Constructors in C++ | Engineering Education (EngEd) Program](https://www.section.io/engineering-education/introduction-to-constructors-in-c++/)

25. Draw the Use Case diagram of online railway ticket reservation system

[Sequence Diagram Templates to Instantly View Object Interactions](https://creately.com/blog/examples/sequence-diagram-templates/)

[Railway Reservation System Use Case Diagram](https://www.freeprojectz.com/use-case/railway-reservation-system-use-case-diagram)

[Railway Reservation System UML Diagram](https://www.freeprojectz.com/uml-diagram/railway-reservation-system-uml-diagram)

**PART C (12 Marks)**

**Answer the Questions Briefly:-**

**Refer PART – A & 12 Marks Questions from “18CS202J-OODP Question bank All Units” (File)**

**1.** Write the problem statement for Library Management system. Design UML Class diagram and explain its components (CLA1-L3)

[Class Diagram for Library Management System](https://www.geeksforgeeks.org/class-diagram-for-library-management-system/)

[Library management system UML diagrams](https://www.startertutorials.com/uml/uml-diagrams-library-management-system.html#Use_case_diagram)

[Design a Library Management System - Grokking the Object Oriented Design Interview](https://www.educative.io/courses/grokking-the-object-oriented-design-interview/RMlM3NgjAyR#Class-diagram)

**2.** What is UML? Explain its components with suitable example (CLA1-L1)

[Unified Modeling Language (UML) | An Introduction](https://www.geeksforgeeks.org/unified-modeling-language-uml-introduction/)

**3.** There are 50 computers available in computer programming lab where each computers are used six hours per day. Write a C++ program using classes and objects that contain getDetail() for getting input from user,calculatesecondperDay() for calculating the usage of each computer in seconds per day ,calculateminutesperWeek() for calculating the usage of each computer in minutes per week ,calculatehourperMonth() for calculating usage of each computer in hour per month and calculatedayperYear() for calculating usage of each computer in day per year (CLA1- L3)

**4.** Give example for cast? Explain OOPS features with suitable example.(CLA1-L2)

[Object Oriented Programming in C++](https://www.geeksforgeeks.org/object-oriented-programming-in-cpp/)

[C++ Type Casting - W3Schools](https://www.w3adda.com/cplusplus-tutorial/cpp-type-casting)

[Type Casting - C++ Tutorials](https://www.cplusplus.com/doc/oldtutorial/typecasting/)

**5.** Write the problem statement for Railway Reservation System. Design UML Class diagram and explain its components (CLA1-L3)

[Sequence Diagram Templates to Instantly View Object Interactions](https://creately.com/blog/examples/sequence-diagram-templates/)

[Railway Reservation System Use Case Diagram](https://www.freeprojectz.com/use-case/railway-reservation-system-use-case-diagram)

[Railway Reservation System UML Diagram](https://www.freeprojectz.com/uml-diagram/railway-reservation-system-uml-diagram)

**6.** Explain in detail about constructor and demonstrate with an example (CLA1-L1)

[Constructors in C++](https://www.geeksforgeeks.org/constructors-c/)

**7.** Design UML Class diagram for ATM system and write C++ code for each class. (CLA1-L3)

[UML Class Diagram Tutorial](https://www.lucidchart.com/pages/uml-class-diagram)

[UML Class Diagram Tutorial: Abstract Class with Examples](https://www.guru99.com/uml-class-diagram.html)

[ATM Case Study, Part 1: Object-Oriented Design with the UML](https://pages.cpsc.ucalgary.ca/~mmoniruz/233/DesignExercise.pdf)

**8.** Compare local and global variable and demonstrate classes and objects with real time example (CLA2-L2)

[Difference between Local variable and Global Variable - javatpoint](https://www.javatpoint.com/local-variable-vs-global-variable)

9. Create three classes with names Shape, Rectangle and Circle and make use of the functions getdata(), printdata(), and area(). To find the area of circle and rectangle, which type of inheritance is suitable? Why? Explain?

[C++ Triangle and Rectangle - calculate area of Triangle and rectangle using data members from base class](https://www.roseindia.net/answers/viewqa/Hibernate/25755-C-Question-2.html)

[C++ : Create a base class Shape .Use this Class to store two double type values that could be used to compute areas. Add two derived Class Triangle and Rectangle from the base Class Shape. Add to the base class, a member functions get\_data () to initialize the data members in the base class and add another member function display\_area () to compute the area. Declare this member function as virtual. Write a C++ program to implement the class that accepts dimensions and calculate area. (RUN TIME POLYMORPHISM) – Aniruddha Sadhukhan](https://anianiruddha.wordpress.com/2018/01/16/c-create-a-base-class-shape-use-this-class-to-store-two-double-type-values-that-could-be-used-to-compute-areas-add-two-derived-class-triangle-and-rectangle-from-the-base-class-shape-add-to-the/)

10. A Library lends books and magazines to member, who is registered in the system. It also maintains the purchase of new books and magazines for the Library. A member can reserve a book or magazine that is not currently available in the library, so that when it is returned or purchased by the library, that person is notified. The library can easily create, replace and delete information about the books, members, and reservation in the system. The books transactions are stored in the database. The fine list while the member returns the book after the due date must be

generated. Design the use case diagram and discover the users and actors of this system, and the interactions between them must be depicted.

[BOOK BANK SYSTEM Date: AIM: To create a system to perform book bank operation (I) PROBLEM STATEMEN](https://www.vidyarthiplus.com/vp/attachment.php?aid=24306#:~:text=A%20Book%20Bank%20lends%20books,date%20or%20poor%20in%20condition)

[Use Case Diagram for Library Management System](https://www.geeksforgeeks.org/use-case-diagram-for-library-management-system/)

[UML软件工程组织](http://www.uml.org.cn/appcase/appcase1218002.htm)

11. Design and illustrate the use case model for activities involved in ordering food in a restaurant from the point when the customer enters a restaurant to the point when he leaves the restaurant.

[Restaurant Order System Use Case](https://creately.com/diagram/example/ie54gr4b1/restaurant-order-system-use-case)

[Food Ordering System Use Case Diagram](https://www.freeprojectz.com/use-case/food-ordering-system-use-case-diagram)

[Online Food Order System for Restaurants](https://scholarworks.gvsu.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1222&context=cistechlib)

[Project: Fast Food Automated Ordering System](https://user.eng.umd.edu/~austin/ense621.d/projects04.d/project-food-ordering.html#sec2)

12. Explain the benefits and concepts of use case and use case model and analyze the relating use cases have in ATM system

[Use Case Diagram for Bank ATM System](https://www.geeksforgeeks.org/use-case-diagram-for-bank-atm-system/)

[Use Case Benefits](https://casecomplete.com/use-case-benefits)

[Use-Case Model](https://www.javatpoint.com/use-case-model)

[UML - Use Case Diagrams](https://www.tutorialspoint.com/uml/uml_use_case_diagram.htm)

13. Describe a suitable example showing the various relationships used in Use Case and also give a short note on each relationship.

[Use Case Diagram Relationships Explained with Examples](https://creately.com/blog/diagrams/use-case-diagram-relationships/)

[Use Case Relationships](https://www.w3computing.com/systemsanalysis/use-case-relationships/)

14. List the Various UML diagrams and explain the purpose of each diagram

[Different UML Diagrams - Purpose and Usage](https://www.edrawsoft.com/uml-introduction.html)

[Unified Modeling Language (UML) | An Introduction](https://www.geeksforgeeks.org/unified-modeling-language-uml-introduction/)

[UML Diagram Types | Learn About All 14 Types of UML Diagrams](https://creately.com/blog/diagrams/uml-diagram-types-examples/)

15. By considering the Library management system, perform the object oriented System Development and give the use case model for the same (use include, extend and generalization)

[Design a Library Management System - Grokking the Object Oriented Design Interview](https://www.educative.io/courses/grokking-the-object-oriented-design-interview/RMlM3NgjAyR)

[Use Case Diagram for Library Management System](https://www.geeksforgeeks.org/use-case-diagram-for-library-management-system/)

16. A University conducts examinations and the results are announced. Prepare a report for the following:

• Print the marks in the register number order semester wise

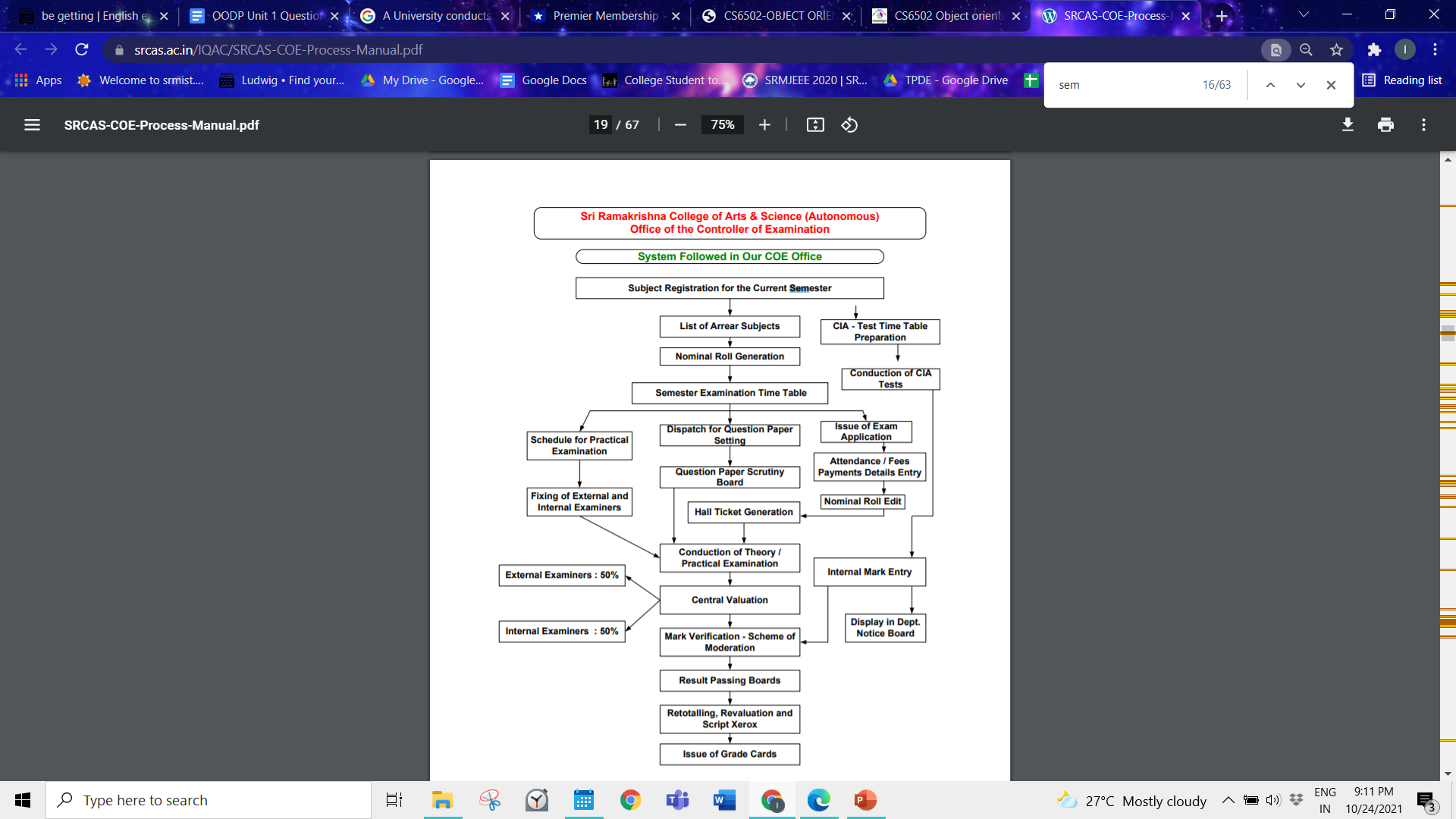
for each department

• Print the Arrear list semester wise.

• Prepare a Rank list for each department.

• Prepare the final aggregate mark list for final year students.

Identify the problem statement and Design and Explain the classes for each sequence. Design the Use case case & Class diagram



17. Analyze and design for Library Information System which comprises the following notations and explain them. (i)Aggregation (ii) Composition (iii) Association.

[UNIT - 1 UML DIAGRAMS 1101 AMSCE - DEPARTMENT OF IT](https://www.aalimec.ac.in/wp-content/uploads/2020/01/CS8592-Object-Oriented-Analysis-and-Design-Question-Bank_watermark.pdf) **(ans available in slide 164)**

[Association, Aggregation, Composition, Abstraction, Generalization, Realization, Dependency](https://javapapers.com/oops/association-aggregation-composition-abstraction-generalization-realization-dependency/)

18. Design the Class diagram for Hospital management system?

[UML Diagrams for Hospital Management System](http://www.programsformca.com/2012/03/uml-diagrams-for-hospital-mgmt-system.html)

[Class diagram for Online Hospital Management System | CS1403-CASE Tools Lab](https://www.sourcecodesolutions.in/2011/04/class-diagram-for-hospital-management.html)

[An example domain model for the Hospital Management System is represented by several UML class diagrams.](https://www.uml-diagrams.org/examples/hospital-domain-diagram.html)

19. With a suitable example explain how to design a class. Give all possible representation in a class (such as: name, attribute, visibility, methods, and responsibilities).

[UML Class Diagram](https://www.javatpoint.com/uml-class-diagram)

[What is Class Diagram?](https://www.visual-paradigm.com/guide/uml-unified-modeling-language/what-is-class-diagram/)

[UML Class Diagram Tutorial: Abstract Class with Examples](https://www.guru99.com/uml-class-diagram.html)

20. Draw Use case Diagram for online Pizza ordering system

[Pizza Ordering System Use Case Diagram](https://www.freeprojectz.com/use-case/pizza-ordering-system-use-case-diagram)

[Fig 3: Use Case Diagram for the Restaurant Ordering System](https://www.researchgate.net/figure/Use-Case-Diagram-for-the-Restaurant-Ordering-System_fig3_323230406)