

SAVITRIBAI PHULE PUNE UNIVERSITY
M.Sc. (Computer Application) Sem I
Practical Examination (2023 Pattern)
SUBJECT: CA 504 MJP
Lab Course Based on CA 501 MJ & CA 503 MJ
(Database Systems and SQL, Operating Systems)

Time: 3 Hours

Max. Marks: 35

Q.1) Consider the following database:

Room (room_no, room_name, room_type, charges)

Guest (Guest_code, Gname, city, no_of persons)

The relationship is as follows: Room-Guest: one-to-one. The room_type can have values as either 'AC' or 'NonAC'.

A) Create above database in PostgreSQL and insert sufficient records.

[10 Marks]

Execute the following queries in PostgreSQL

- i) List all guests whose name starts with "S".
- ii) Increase the charges of all AC rooms by 15%.
- iii) List the minimum charges of a room.
- iv) List the names of the guests in the sorted order by city name.

B) Write a procedure to find sum and product of two numbers.

[10 Marks]

Q.2) Write a program to implement FCFS CPU scheduling algorithm. Take arrival time, burst time for n number of processes from the user. Calculate average waiting time.

[10 Marks]

Q.3) Viva

[5 Marks]

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Q.1) Consider the following database:

College (cno, cname, street name, ccity)

Principal (pno, pname, experience, Salary)

The relationship is as follows: College-Principal: one-to-one. Experience must greater than 10 years.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
Execute the following queries in PostgreSQL

- i) Display all colleges whose name contains 'and'.
- ii) List the average salary of a Principal.
- iii) List the names of all Principals having experience between 10 to 20 years.
- iv) Change the street name of college _____ from MG Road to Nehru road.

B) Write a stored procedure to insert a record in table College. [10 Marks]

Q.2) Write a program to implement FCFS CPU scheduling algorithm. Take arrival time, burst time for n number of processes from the user. Calculate average turnaround time. [10 Marks]

Q.3) Viva [5 Marks]

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Q.1) Consider the following database:

Employee(eno, ename, designation, salary)

Department(dno, dname, location)

The relationship is as follows: Employee-Department: many-to-one. Location should not be null.

A) Create above database in PostgreSQL and insert sufficient records. **[10 Marks]**
Execute the following queries in PostgreSQL

- i) Give a 5% raise in salary to all the employees.
- ii) Display average salary of an employee.
- iii) List the details of all the departments located at city _____.
- iv) Display the details of employees whose names ends with an alphabet "r".

B) Write a stored function **using cursors** to display all the details of Employee whose salary is more than 80,000. **[10 Marks]**

Q.2) Write a program to simulate Pre-emptive Shortest Job First (SJF) CPU scheduling algorithm. Accept no. of processes, arrival time and burst time from user. Calculate and display the average waiting time. **[10 Marks]**

Q.3) Viva **[5 Marks]**

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Q.1) Consider the following database:

Person (pnumber, pname, birthdate, income)
Area (area_code, aname, area_type, pincode)

The relationship is as follows: Person-Area: many-to-one. The area_type can have values as either “urban” or “rural”.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
Execute the following queries in PostgreSQL

- i) List the details of all people whose name starts with the alphabet “R”.
- ii) Display the details of people in the sorted order of their income.
- iii) Display the count of areas of “urban” type.
- iv) Change the pincode of “kalyaninagar” to 411036.

B) Create a stored procedure named as “addrecords” for adding person records. [10 Marks]

Q.2) Write a program to simulate Pre-emptive Shortest Job First (SJF) CPU scheduling algorithm. Accept no. of processes, arrival time and burst time from user. Calculate and Display the average turnaround time. [10 Marks]

Q.3) Viva [5 Marks]

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Q.1) Consider the following database:

Doctor (dno, dname, addr, phone_no, specialization)

Patient (pno, pat_name, city, disease)

The relationship is as follows: Doctor-Patient: many-to-many.

A) Create above database in PostgreSQL and insert sufficient records.

[10 Marks]

Execute the following queries in PostgreSQL

- i) Find the names of all doctors which start with "M".
- ii) Count the number of doctors who are Neurologists.
- iii) Give the list of all patients who are suffering from "Fever".
- iv) Find the specialization and phone numbers of all doctors from Alandi.

B) Write a stored function using cursors to display all the details of all Patients from Nashik city.

[10 Marks]

Q.2) Write a program to simulate Non-Pre-emptive Shortest Job First (SJF) scheduling. Accept no. of processes, arrival time and burst time. Calculate and display the average waiting time.

[10 Marks]

Q.3) Viva

[5 Marks]

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Q.1) Consider the following database:

Student (rno, name, city)

Teacher(tno, tname, phone_no, salary)

The relationship is as follows: Student-Teacher: many-to-many with subject as a descriptive attribute.

A) Create above database in PostgreSQL and insert sufficient records. **[10 Marks]**

and

Execute the following queries in PostgreSQL

- i) List all students whose name start from 'Sh' .
- ii) Display the count of students from city _____.
- iii) Find the maximum salary of teachers.
- iv) Change the phone number of "Prof. Satkar" to "9822131226"

B) Create a stored procedure named as "updaterecords" to give 5% rise in salary of teacher.

[10 Marks]

Q.2) Write a program to simulate Non-Pre-emptive Shortest Job First (SJF) scheduling. Accept no. of processes, arrival time and burst time. Calculate and display the average turnaround time.

[10 Marks]

Q.3) Viva

[5 Marks]

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Q.1) Consider the following database:

Policy (pno, pname, premium_amt, policy_type)

Customer (cno, cname, city, agent_name)

The relationship is as follows: Policy-Customer: many-to-one. The “policy_type” can have values as “Yearly”, “Half-yearly” or “Monthly”

A) Create above database in PostgreSQL and insert sufficient records. **[10 Marks]**
and Execute the following queries in PostgreSQL

- i) List the details of all customers who live in _____city.
- ii) Display the average premium amount.
- iii) Increases the premium amount for Monthly policies by 10%.
- iv) Display the policy type wise count of policies.

B) Create a stored function named as names as “max_premium” which will find max premium amount. **[10 Marks]**

Write a program for Round Robin (RR) scheduling for a given time quantum. Accept no. of processes, arrival time and burst time for every process and time quantum. Calculate the waiting time of every process and Display the average waiting time. **[10 Marks]**

Q.3) Viva **[5 Marks]**

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Q.1) Consider the following database:

Item (item_no, name, quantity)

Supplier (s_no, name, city)

The relationship is as follows: Item-Supplier: many-to-many.

A) Create above database in PostgreSQL and insert sufficient records. **[10 Marks]**
and Execute the following queries in PostgreSQL

- i) Change the quantity for item “Mouse” to 800.
- ii) List the details of the suppliers whose name begins with the alphabet “M”.
- iii) Display the count of items.
- iv) List the names of suppliers who do not live in city.

B) Write a stored function to find the minimum quantity of item. **[10 Marks]**

Q.2) Write a program to implement Bankers algorithm. Mention no. of processes and available resources. Calculate need matrix based on max and allocation matrix.

[10 Marks]

Q.3) Viva

[5 Marks]

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Q.1) Consider the following database:

Student (sno , s_name, s_class) s_class can be either "FY", "SY" or "TY" Teacher (tno , t_name, yrs_experience)

The relationship is as follows: Student-Teacher: M-M with descriptive attribute subject.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostgreSQL

- i) Give class-wise number of students.
- ii) List all students studying in class "TY".
- iii) Count the number of students who have taken subject "__".
- iv) Delete record of student whose sno = 101.

B) Write a stored function to take teacher name as input and returns the years of experience of that teacher. [10 Marks]

Q.2) Consider a system with 'm' processes and 'n' resource types. Accept number of instances for each resource type. For each process accept the allocation and maximum requirement matrices. Write a program to display the contents of need matrix.

[10 Marks]

Q.3) Viva

[5 Marks]

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Q.1) Consider the following database:

Account (acct_no, acct_type, balance, branch_name)

Customer (cust_no, cust_name, cust_city)

Relationships: Customer-Account :1-M. acct_type can be “saving” or “current”

**A) Create above database in PostgreSQL and insert sufficient records.
and Execute the following queries in PostgreSQL**

[10 Marks]

- i) Display information of all saving accounts having balance > 500,000
- ii) Count customers whose name starts with ‘r’.
- iii) Find the total balance at branch “M.G.Road”.
- iv) Delete the record whose cust_name is_____.

B) Write a stored function using cursors to print names of all customers from city_____.

[10 Marks]

Q.2) Write a Program to implement following functionality

Accept Available

Display Allocation, Max

Display the contents of need matrix

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P1	0	1	0	7	5	3	3	3	2
P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

[10 Marks]

Q.3) Viva

[5 Marks]

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Q.1) Consider the following database:

Bus (Bus_no , capacity ,depot_name)

Route (Route_no ,source ,destination ,no_of_stations)

Relationship : Bus-Route : M-1. Bus capacity is not null

A) Create above database in PostgreSQL and insert sufficient records.

[10 Marks]

and Execute the following queries in PostgreSQL

- i) List all buses which belongs to depot ____.
- ii) Delete Bus details whose Bus number is _.
- iii) List the route details having number of stations > 10.
- iv) List all routes starting from Station _____.

B) Write a stored function using cursors to accept route_no from the user and display number of stations of that route.

[10 Marks]

Q.2) Write a program to simulate Non-pre-emptive Shortest Job First (SJF) – scheduling. Accept no. of processes, arrival time and burst time from user. The output should be the waiting time for each process. Also find the average waiting time.

[10 Marks]

Q.3) Viva

[5 Marks]

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Q.1) Consider the following database:

Game (gcode, gname, noofplayers, coachname, captain_name)

Player (pno, pname)

There exists a one-to-many relationship between Game and Player

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostGreSQL

- i) Display all game names that ends with “ball”.
- ii) Give the average number of players.
- iii) Display all details of game “kho kho”.
- iv) Update the coach name from “_____” to “_____” for game “hockey”.

B) Create a stored procedure named as “deleterecords” for deleting the Game record having coach name _____ [10 Marks]

Q.2) Write a program to simulate Non-pre-emptive Shortest Job First (SJF) CPU– scheduling.
Accept no. of processes, arrival time and burst time from user. The output should be the turnaround time for each process. Also find the average turnaround time.

[10 Marks]

Q.3) Viva [5 Marks]

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Q.1) Consider the following database: Item (item_no, name, quantity, rate)
Supplier (s_no, name, city, contact)

The relationship is as follows: Item-Supplier: many-to-many.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostgreSQL

- i) List the details of the suppliers whose name begins with the alphabet „P“.
- ii) Delete record of item_no_.
- iii) Display the count of items with rate > 50Rs.
- iv) List the names of suppliers live in_city.

B) Write a function to find the details of items whose quantity is greater than 30. [10 Marks]

Q.2) Write a program to simulate FCFS CPU-scheduling. Accept no. of Processes, arrival time and burst time from user. The output should give Gantt chart, and waiting time for each process. Also find the average waiting time.

[10 Marks]

Q.3) Viva

[5 Marks]

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Q.1) Consider the following database:

Book (Book_no, title, author, price, year_published)

Customer (cid, cname, addr)

Relation between Book and Customer is Many to Many with quantity as descriptive attribute.

A) Create above database in PostgreSQL and insert sufficient records. [10 marks]
and Execute the following queries in PostgreSQL

- i) Display customer details staying at "Pune".
- ii) Display author wise details of book.
- iii) Display the average price of a book.
- iv) Delete the record from book table with Book_no_.

B) Write a function, to define a cursor to print the details of the Books published in year 2024. [10 marks]

Q.2) Write a program to simulate FCFS CPU-scheduling. Accept no. of Processes, arrival time and burst time from user. The output should give Gantt chart, and turn around time for each process. Also find the average turn around time.

[10 Marks]

Q.3) Viva

[5 Marks]

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Q.1) Consider the following database:

Sales_order(s_orderno, s_order_date, order_amt)

Client(client_no, name, address)

The relationship is as follows: Client and Sales_order: one-many. order_amt should be > 0

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostgreSQL

- i) Display all sale records having order date before “_____”.
- ii) Find maximum sales order amount.
- iii) Update the client address of all clients from “Nasik” to “Ahilyanagar”.
- iv) Add column order_status to the Sales_order table.

B) Create a stored procedure named as “addrecords” for adding new sales order records. [10 Marks]

Q.2) Write a program to simulate Pre-emptive Shortest Job First (SJF) – scheduling. Accept no. of processes, arrival time and burst time from user. The output should be the waiting time for each process. Also find the average waiting time.

[10 Marks]

Q.3) Viva [5 Marks]

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Q.1) Consider the following database:

Car (car_code, c_name, c_price, color_type) color_type can be “metallic” or “solid” Customer (cust_code, cust_name, cust_address)

The relationship is as follows: Customer and car: one-to-many.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostgreSQL

- i)** Find the names of all Customers whose name start with “B”.
- ii)** Count the number of “metallic” cars.
- iii)** Give the list of all customers staying in ShivajiNagar.
- iv)** Increase the price of all “Ferrari” cars by 15%.

B) write a stored function to display details of all metallic coloured cars having price in the range 100000 to 500000. [10 Marks]

Q.2) Write a program to simulate Pre-emptive Shortest Job First (SJF) – scheduling. Accept no. of processes, arrival time and burst time from user. The output should be the turn around time for each process. Also find the average turn around time.

[10 Marks]

Q.3) Viva

[5 Marks]

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Q.1) Consider the following database:

Property (pno, description, area, rate) rate should be > 0
Owner (owner_name, city, phno)

The relationship is as follows: owner and Property : One to Many.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostgreSQL

- i) List the name of owners that ends with letter 'a'.
- ii) Display the average rate of a property.
- iii) Update the phone Number of "Dr. Vikas" to 8856916175.
- iv) Display area wise property details.

B) Create a stored function named as "min_price" which will find minimum rate of property. [10 Marks]

Q.2) Write a program for Round Robin scheduling for given time quantum. Accept no. of processes, arrival time and burst time for each process and time quantum. The output should give the waiting time for each process. Also display the average waiting time. [10 Marks]

Q.3) Viva [5 Marks]

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Q.1) Consider the following database:

Employee (emp_no, emp_name, city, designation, salary)

Project (project_no, project_name, status, start_date)

The relationship is as follows: Employee and Project: many-to-one.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostgreSQL

- i) Add constraint status. The value of status should be “Complete”, “In progress”.
- ii) Count the number of Projects which are “in progress”.
- iii) Increase the salaries of all employees working on project 10 by 5%.
- iv) Display names of all completed projects.

B) Create a stored function named as names as “max_salary” which will find maximum salary of an employee. [10 Marks]

Q.2) Write a program for Round Robin scheduling for given time quantum. Accept no. of processes, arrival time and burst time for each process and time quantum. Calculate the turn around time for each process. Display the average turn around time. [10 Marks]

Q.3) Viva [5 Marks]

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Q.1) Consider the following database:

Project (pno, pname, start_date, budget, status) Project Status Constraints: C – completed, P-Progressive, I-Incomplete
Department (dno, dname, HOD, no_of_staff)

The relationship is as follows: Project- Department Many to One.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostgreSQL

- i) Display the project names that have start date as 12/6/2019.
- ii) Display the total budget of projects.
- iii) Display the HOD name of Computer department
- iv) all project names having budget more than 30000.

B) Write a stored function using cursors to display names of all projects which are “in progress”. [10 Marks]

Q.2) Write a program to simulate FCFS CPU-scheduling. Accept no. of Processes, arrival time and burst time from user. The output should give Gantt chart.

[10 Marks]

Q.3) Viva

[5 Marks]

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Q.1) Consider the following database:

Bus (bus_no, capacity, depot_name)

Driver (driver_no, driver_name, license_no, address, age)

The relationship is as follows: Bus and Driver: M-M with the descriptive attribute Date_of_duty.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostgreSQL

- i) Find the number of buses having capacity more than 20.
- ii) Count number of drivers having age > 40.
- iii) Give the names of all drivers starting with 'S'.
- iv) Display all bus details of _____ depot.

B) Write a stored procedure to find maximum of two numbers. [10 Marks]

Q.2) Write a program for Round Robin scheduling for given time quantum. Accept no. of processes, arrival time and burst time for each process and time quantum from user. Display the content of Gantt Chart. [10 Marks]

Q.3) Viva [5 Marks]

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Q.1) Consider the following database:

Customer (cust_no, cust_name, city)

Loan (loan_no, loan_amt) loan_amt should be > 0.

Relation between Customer and Loan is Many to Many.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostgreSQL

- i) List all customers whose name starts with 'A'.
- ii) Display city-wise customer names.
- iii) Display all loan numbers whose amount is more than 2 lakhs.
- iv) Change city 'Pune' to 'Mumbai' for customer '_____'

B) Write a stored function using cursors to display details of all customers sorted by city names. [10 Marks]

Q.2) Write a program to simulate Pre-emptive Shortest Job First (SJF) – scheduling. Accept no. of processes, arrival time and burst time from user. Display the content of Gantt Chart. [10 Marks]

Q.3) Viva [5 Marks]

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Q.1) Consider the following database:

Customer (cust_no, cust_name, city) product (product_no, pname, price) price should be > 0.

Relation between Customer and product is Many to Many.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostgreSQL

- i) List all customers whose name ends with 'A'.
- ii) Count number of products whose price is more than 1000.
- iii) Increase price of all products by 5%.
- iv) Display details of customer who are from _____ city.

B) Create a stored procedure named as “addrecords” to add customer record. [10 Marks]

Q.2) Write a program to simulate Non-pre-emptive Shortest Job First (SJF) CPU– scheduling. [10 Marks]
Accept no. of processes, arrival time and burst time from user. Display the content of Gantt Chart.

Q.3) Viva [5 Marks]

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Max. Marks: 35

Q.1) Consider the following database:

Student (rno, name, city)

Subject (subno, subname, teachername)

Relation between Customer and product is Many to Many with descriptive attribute mark.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostgreSQL

- i) List all students from city _____.
- ii) Count number of subjects taught by _____.
- iii) Display name of all teachers who teaches subject “OS”
- iv) Delete record of a student named _____.

B) Create a stored procedure named as “addrecords” to add student record. [10 Marks]

Q.2) Write a program for Round Robin scheduling for given time quantum. Accept no. of processes, arrival time and burst time for each process and time quantum Display the content of Gantt Chart.

[10 Marks]

Q.3) Viva

[5 Marks]

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Max. Marks: 35

Q.1) Consider the following database:

Book (bid, btitle, price, publication)

Author (aid, aname, mobile number, city)

Relation between Author and Book is one to Many

**A) Create above database in PostgreSQL and insert sufficient records.
and Execute the following queries in PostgreSQL**

[10 Marks]

- i) display author names that starts with S.
- ii) Display the total price of book published by "Prentice hall".
- iii) Update mobile number of author named _____ to 9844567822
- iv) Display details of books written by author _____.

B) Create a stored function named as "max_price" which will find maximum book price.

[10 Marks]

Q.2) Write a program to implement Bankers algorithm. Mention no. of processes and available resources. Calculate need matrix based on max and allocation matrix.

[10 Marks]

Q.3) Viva

[5 Marks]

SAVITRIBAI PHULE PUNE UNIVERSITY
M.Sc. (Computer Application) Sem I
Practical Examination (2023 Pattern)
SUBJECT: CA 504 MJP
Lab Course Based on CA 501 MJ & CA 503 MJ
(Database Systems and SQL, Operating Systems)

Time: 3 Hours

Max. Marks: 35

Q.1) Consider the following database:

Professor (prof_no, prof_name, designation, salary)
Department (dno, dname, location)

The relationship is as follows: Department-Professor: one to many.

A) Create above database in PostgreSQL and insert sufficient records. [10 Marks]
and Execute the following queries in PostgreSQL

- i) Display average salary of professor.
- ii) List the details of all the departments located at _____.
- iii) Display the details of professors whose names ends with an alphabet “r”.
- iv) Display details of all professors working in “Computer” department.

B) Create a stored procedure named as “display_message” which will display the message “Welcome to RDBMS world!!!!.” [10 Marks]

Q.2) Write a Program to implement following functionality

Accept Available

Display Allocation, Max

Display the contents of need matrix

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P1	0	1	0	7	5	3	3	3	2
P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

[10 Marks]

Q.3) Viva

[5 Marks]