



Problem Definitions for July 2019 & January 2020

Important Notes

1. **Viva-voce of this project is compulsory.**
2. **Please follow MCS-044 guidelines for process of solving project problem and for the presentation format for submission of mini project report.**
3. **Please do not attempt the problems given in the course material of MCS-044, Block -1 or any other old problems. You must attempt one of the problems given in this section, if you submit mini project during July, 2019 or January, 2020 session.**

INTRODUCTION

The mini project is designed to help you develop practical ability and knowledge about practical tools/techniques in order to solve real life problems related to the industry, academic institutions and computer science research. The course Mini Project is one that involves practical work for understanding and solving problems in the field of computing. In this booklet the list of the problem definitions for the July, 2019 and January, 2020 sessions are given. Every year, the list of problem definitions will change. **Please do not attempt the problems given in the booklet (MCS-044, Block-1) received by you along with your course material.**

PROBLEM DEFINITIONS

We have divided different projects into four broad areas / categories of computer science as given below, so that you can select any one of these categories for your Mini project.

- Application development
- Networking project
- System software
- Website development.

An initial list of project definition will be given below in the following sections. However, student can elaborate the project definitions after discussing it with the project counsellor. Students should **select one project from the given categories only** as per their interest, experience and knowledge in that area. Students should evaluate themselves and then should choose the project. Students may propose modifications/suggestions in the given project specification and finalize it in consultation with the MCS-044 counsellor.

APPLICATION DEVELOPMENT PROJECTS

Here we focus on investigating ideas in application development through different projects. A set of possible project name and their details will be presented, however, students are encouraged to be creative and develop their own ideas in the given project descriptions.

1) **Project Name: Stationery Management System in an Office**

Description

Every office uses large amount of Stationery. XYZ Company has a staff of about 50 knowledge workers who performs most of their work using computers. However, they still are using many stationery items like – pens, pencils, paper, erasures, clip folders, paper folders, paper bags, clips, staplers, paper cutters, paper punch and so on. In order to economise the use of these stationery items, company decided to develop a centralised stationery management system. This system maintains the records of current stationery items. All the items are issued using this software to individuals. The company creates monthly reports of issue of various items. It also creates the department wise list of usage of stationery items. In each department the person who is using the paper the least is given incentive.

Analyse the system requirements, and design the system. Use suitable data structure/database to create this system. You may add more functionality into the system.

2) **Project Name: Vehicle Management System**

Description

A University maintains the record of all the vehicles owned by University staff and students. Every new vehicle is to be registered by the owner using a form, which includes data like owner name, registration number of the vehicle given by transport department, vehicle type, year of manufacture of vehicle and year of purchase of the vehicle by current owner etc. The University pastes an electronic token to each of these vehicles. University also has an automatic token reader on all its entrances, which automatically reads the token of incoming or outgoing vehicles, and allows only authorised vehicle to enter or exit University premises. A guest is given a Guest token at the entry which s/he has to return on her/his exit. The information about the guests is also recorded in the database.

Analyse the system requirements, and design the system. Use suitable data structure/database to create this system. You may add more functionality into the system

NETWORKING PROJECTS

We will focus on simulating some of the basic protocols on 8-10 nodes to make networking project. Two of the possible project topics are presented here, however, students are encouraged to be creative and develop their own ideas in the given project domains.

1) **Project Name: Simulation of TCP/IP protocol**

Description

Simulate TCP/IP protocol by creating one client and one server, the client should send two simple messages to the server like “Hello” and “World” and the server should concatenate these two strings and return it in single string “Hello World”. You must use TCP/IP protocol for this purpose. You must provide detailed documentation about implementation of the project.

2) **Project Name: Simulation of Static Routing**

Description

Assume that a network contains about 5-6 nodes. Demonstrate static routing between these networks. Make suitable assumptions. You must use proper data structure, and provide detailed documentation about implementation of the project.

SYSTEM SOFTWARE DEVELOPMENT PROJECTS

Here we will focus on implementing some of the basic system software application. Two of the possible projects and their details are given here, however you are encouraged to be creative and develop your own ideas in the given project domains.

1) **Project Name: Developing library Utilities for File encryption and decryption**

Description

Create library utilities preferably using UNIX/Linux that accepts a file and encrypts it using any encryption algorithm (you must implement the encryption algorithm yourself and should not use existing library utility). You must also write the appropriate utility to decrypt the file encrypted using your encryption algorithm. You must write proper algorithm for encryption and decryption giving details of data structure and the processes. You must use an object oriented programming language for implementing this project.

2) **Project Name: Implementation of Mutual Exclusion and Synchronisation**

Description

Assume that there is a shared buffer containing the balance amount of an account which can be accessed by a withdrawal process that reduces the balance amount; a deposit process that increases the balance; a hold process that stops all other processes from using this data; and an unhold process which can be run only if the buffer has been put in hold state by hold process, to make balance available for any further processing. Implement the processes using appropriate data structure and constructs that ensure no concurrency related problem. You may make suitable assumptions for the implementation. You may use any programming language for this implementation.

WEB DEVELOPMENT PROJECTS

Here, we will focus on investigating new ideas in application development through different projects. A set of possible project name and their details will be presented, however, students are encouraged to be creative and develop their own ideas in the given project descriptions.

1) **Project Name: System for Managing Online Entrance Examination**

Description

A University conducts online entrance examination for the students who wants to take admission. You need to design a system for management the activities prior to online examination. The sequence of these activities is – making a database of examination centers with names of examination center in-charge, centre name and address, and number of seats available in the center; receiving online applications from the students including their details and selection of examination center from

the list of examination centers where seats are still available, and issue of confirmation letter cum hall tickets to the students. Analyse the requirements for the system in details and design & develop the online system. You must study the problem domain.

2) **Project Name: Online Project Activity management**

Description

A construction company works on many projects at the same time. Each project is divided into four stages – Site preparation, Construction of Building, Fitting of utilities and accessories, and marketing & sales. A number of people are employed by the company for each of the activity. An employee can be shifted from one project to another as well as from one state to another in the same project. You must record the details of the Projects and employees working on those projects at present as well as in the past. The software should also keep track the status of completion of each project. Study various requirements for such a system. Analyse the requirements in details and design & develop the online system.

GUIDELINES

The MCS-044 block covers the majority of the guidelines regarding the formulation of the project proposal, formulation of the project report and the format to be followed for the project report. However the following are the detailed guidelines with respect to the counseling sessions and evaluation scheme.

Practical Counseling sessions

Students can discuss their topic with the counsellors at study centres and the counsellors will give suggestions on project specification at the study centre during the practical sessions. There are total 10 practical sessions, as given below:

Name of the Topic	No. of Practical Sessions (3 hrs each)
Project specification	1
Coding / Implementation	5
Testing	2
Documentation	2

Role of the Counsellor

The MCS-044 Mini-project counsellor is the person who motivates and helps students during the development of the project. The counsellor should take responsibility for guiding and approving different project processes, including Analysis, Design, Coding, Testing, and also the editing of project reports. Moreover, the main responsibilities of a counsellor are:

- Dedicating adequate time to the student for providing effective supervision and encouragement,
- Making sure that the student chooses a manageable project topic,

- Providing critical comments on the student's work and progress,
- Ensuring the student has access to necessary data,
- Encouraging the student to proceed in the intended direction and to agreed time limits, and
- Making sure that the project is the student's own work.

PROJECT SUBMISSION

Project Proposal

Project proposal should be presented to, reviewed by and agreed upon in consultation with the project counsellor to provide constructive feedback on the proposal and planned programme of the project work. **No need of any formal approval to be taken on any proforma.**

Project Report

The project report will contribute to the assessment and your marks. The format of this report will follow the format, guidelines and suggestions given in the block, but details should also be discussed with your counsellor. The final reports of students doing **the project in a group should not be identical. Each student should emphasise on his/her role and responsibilities in the project work.**

Submission of the Project Report

One copy of the original project report is to be submitted to the Study Centre concerned. A photocopy of the same project report must be retained by the student and should carry with him/her at the time of the viva voce.

EVALUATION SCHEME

MCS-044 course has three main evaluation components consisting of assignment (25 marks), project report (50 marks) and viva-voce (25marks). **A student is required to score 40% marks in each of these components separately for successful completion of the course.**

The project will be assessed by a written report and a combined presentation and viva voce (viva voce). To help the students we have given some guidelines about evaluation and assessment in the next section. If, the examiner finds that the project is lacking in any key areas then, the student will be asked to re-submit the project by selecting a new topic in the next session.

Resubmission of the project by the failed students

If the student fails in project report evaluation or viva-voce or in both, the students need to redo the entire process by selecting a new problem from the list of problems which will be updated every year.

Assignment/Continuous Evaluation

25% of total marks are allotted to assignment/continuous evaluation. The assignment questions are given in the MCA 4th semester assignment booklet.

If the student failed only in assignment component and successfully passed in project report evaluation and viva-voce, s/he needs to submit the fresh assignment of the current year, as is done in the normal courses.

Final Evaluation

The Term End Practical Examination of Mini Project will be conducted at the study centre concerned. 75% of total marks are evaluated in the final evaluation. Out of these 75 marks, 50 marks are allotted for the project report evaluation and 25 marks are allotted for viva voce.