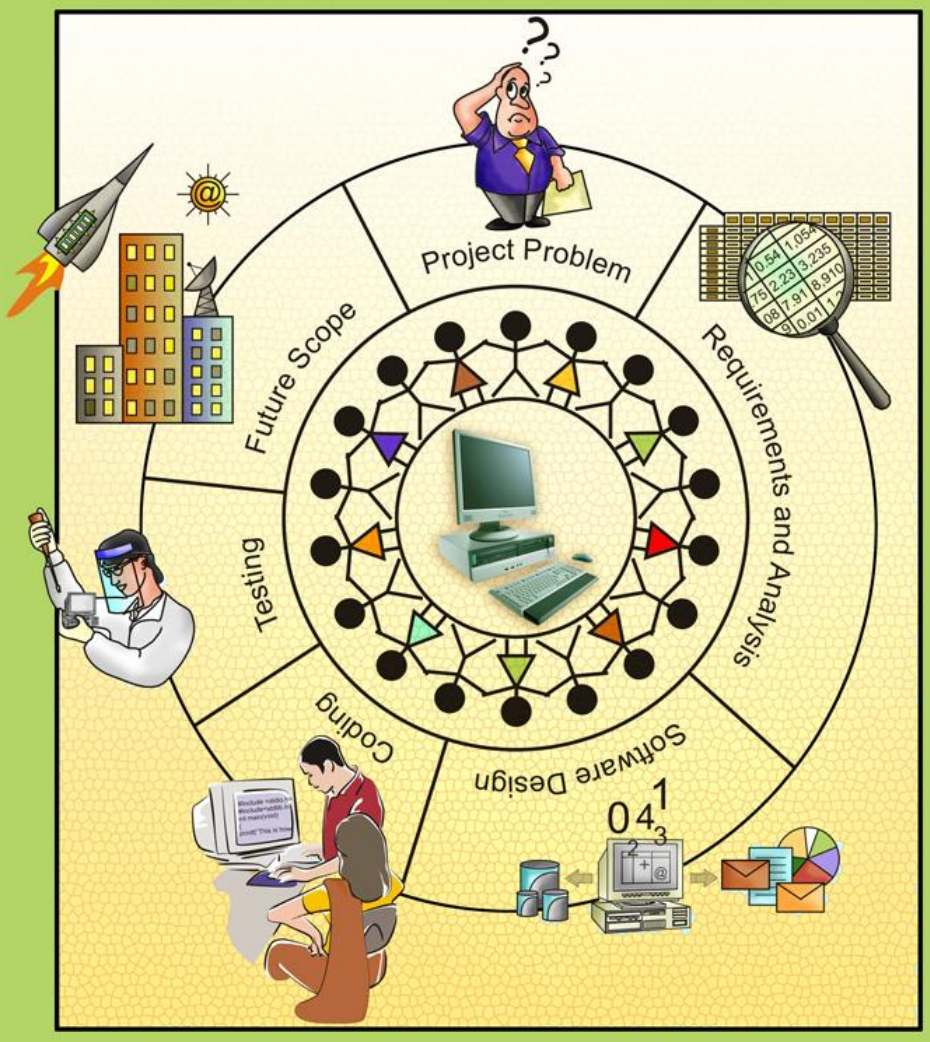
Indira Gandhi National Open University
School of Computer and Information Sciences

MCS-044
MINI PROJECT



Problem Definitions for July 2020 & January 2021

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, 2020 or January, 2021 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, 2020 and January, 2021 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: Programme Management System**
Description

A University offers a flexible approach to learning. It offers 40 different programmes for the students. A programme can be of one to four years duration. Every programme is offered in semester mode. The University follows a Credit based system. A programme has many courses. Each course is of 2 or 4 credits. A student has to register for 8 credit compulsory courses, and 8 credits optional courses in each semester. Thus, each year a student must enrol for 32 credits. This system records the structure of all the courses along with their credits. A student can query this system to get information about the compulsory and optional courses for a particular semester. This system also lists the basic information of each of the courses including credits, syllabus of the course, department that offers the course, the instructor of the course, and the number of lectures, tutorials and practical for each course. A course can be part of many different programmes, however, it may be core in some and optional in others. Design a system that keeps track of courses, programmes and student enrolment into different courses and programs. 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: Medicine Store System**
Description

A medicine store stores information of all the medicines that are being sold by the medicine store. The medicines are supplied to the store by the registered suppliers on receiving the orders from the medicine store. Some of the important information given by the suppliers include the batch number of medicine, manufacturing company name, date of manufacture, date of expiry, price and the type of medicine. The medicine company sells the medicines as per the prescription of the doctors. It generates bill for its customers through this system. The bill includes information on the medicines, its quantity, price, discount, if any and total amount. The bill is issued in the name of the customer and the name of prescribing doctor is also recorded. Create a system, which performs the tasks as above. The system should also maintains the stock of medicines at the medical store. 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 UDP protocol over IP.**
Description

Simulate UDP protocol over IP by creating one client and one server, the client should send two simple messages to the server viz. “UPD is” and “Simple” and the

server should concatenate these two strings and return it in single string "UDP is Simple". You must provide detailed documentation about implementation of the project including headers, checksum etc. You must use implement the protocol on Unix/Linux operating system.

2) Project Name: Simulation of Dynamic Routing
Description
Assume that a network contains about 3-4 nodes. Demonstrate dynamic routing between these nodes by finding the shortest path under dynamic conditions (use single source shortest path). Make suitable assumptions about distance and/or any other parameter reflecting dynamic environment. 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 implements any two of the following encryption/decryption algorithms:
(a) Blowfish encryption algorithm
(b) MD5 encryption algorithm
(c) RSA algorithm
You must implement the encryption algorithm yourself and should not use existing library utilities. You must also write the appropriate utility to decrypt/read the file, encrypted using your encryption algorithm. You must write proper algorithm for encryption/decryption giving details of data structure and the processes. You must use an object oriented programming language for implementing this project.

2) Project Name: Demonstration of Mutual Exclusion and Synchronisation
Description
Demonstrate the implementation of the Dining philosopher problem for at least 7 philosophers and the reader and writer problem. You must write your own code for the same. You must implement the processes using appropriate data structure and constructs that ensure no concurrency related problem like no starvation, no deadlock etc. You may make suitable assumptions for the implementation. You may use any programming language for this implementation. The report for this must be checked by a plagiarism checking software.

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: Online Selling to customers**
Description
A store which sells only limited number of grocery items (say maximum 20) is planning to sell its products online. The store purchase the products from wholesalers in bulk orders and sells it online to its registered customers. The wholesaler supplies the products on credit and any unsold product is returned in case its date of expiry has passed. The store gets a profit margin of 20% on the whole sale rate (cost price). However, the store sometimes offer discounts at 10% for frequent customers. The customer orders the goods online, and money is collected in cash on delivery of the goods. Analyse the requirements for the system in details and design & develop the online system. You must study the problem domain.

2) **Project Name: Online Survey and analysis system**
Description
A startup company conducts online surveys to get feedback for companies. A milk selling company asks the startup to perform the survey on the quality of its products, which include milk, cheese, bread, butter and curd. The customer may be asked to fill information like cost, timely delivery, behaviour of deliverer, any complaint with the product etc. In addition, they also find the basic details of the customer like age, household income, members of the family, cost vs. quality assessment etc. Once this information is collected in a database system, basic summarisation of data is done using SQL queries, which use aggregate functions. This information is then displayed using graphs (you may export data for creating graphs). Study various requirements for such a system. Analyse the requirements in details and design & develop the online system, though graphs may be produced offline, but must be loaded to 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 the 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.