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Faculty of Computing
Programming Fundamentals
Projects and its details

1. Students Evaluation/Assessment

This project is a part of student evaluation system with a limited functionality where following modules are performed;

1. **[15 Marks] Students and Course Management**
   a) Read Names and Roll Numbers of the Student.
   b) Read total Number of Subjects of each student.
   c) Read marks of each subject for a student.
2. **[20 Marks] Result Management**
   a) Calculate average marks of individual student in selected Subject.
   b) Calculate average of Class in particular Subject.
   c) Calculate grades of each student in each subject based on marks.
   d) Calculate GPA of each student.
   e) Calculate average GPA of a class.
   f) Calculate CGPA of the student (from 1st to current Semester).
3. **[25 Marks] Displaying the Results**
   a) Show marks of the students in particular subject.
   b) Show total marks (in all subjects) of the students in a class.
   c) Show GPA of the Students in a class.
   d) Show SGPA of the students.
   e) Show CGPA of the student in a class.
4. **[20 Marks] File management**
   a) Maintain text files of all the data either provided by the user or modified later on.
5. **[20 Marks] Error Handling and online Help**
   a) At each level
   b) If some information is not present in the database, it should display proper messages.
   c) If a wrong input is entered or some mistake is being done by the user, the system should assist the user to correct that mistake.

Required Artifacts:

1. Flow charts (a separate flow chart for each module)
2. Pseudo code.
3. Source code.

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2. Scientific Calculator

Write a program that performs the following mathematical tasks (functions) without using math.h library:

1. **[20 Marks] Arithmetic Calculations.**
    a) Addition, subtraction, multiplication and division of numbers (there could be multiple numbers)
2. **[20 Marks] Logarithmic Calculation.**
3. **[20 Marks] Trigonometric functions.**
4. **[20 Marks] Conversions**
    a) cm into inches
    b) inches into meters
    c) Celsius into Fahrenheit
    d) decimal into binary and vice versa
    e) decimal into hexadecimal and vice versa.
    f) decimal into octal and vice versa
    g) binary into octal and vice versa
5. **[20 Marks] Error Handling and online Help**
    a) At each level
    b) If some information is not present in the database, it should display proper messages.
    c) If a wrong input is entered or some mistake is being done by the user, the system should assist the user to correct that mistake.

Required Artifacts:

1. Flow charts (a separate flow chart for each module)
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3.Automated Quiz

This program is about an online quiz. In this program the system displays to the student various subjects and questions for each of the subject. Then the user answers the questions and finally system displays the marks of the student in a quiz. The details of the various modules are as under;

1. **[20 Marks] Subjects Management**
    a) Create different (4-6) subjects.
    b) Save at least 30 Multiple Choice Questions(MCQs) for each of the subject
    c) For each question, save the following information
        c.1. the question (description/ statement).
        c.2. four options to answer the question.
        c.3. the correct answer.
2. **[40 Marks] Taking the Quiz**
    a) Read name of the student in order to save it for later use.
    b) User should be able to select various subjects (from the available subjects).
    c) User should be able to select a number of questions (5 - 10) for each subject.
    d) The system should be able to randomly generate the quiz i.e. for each subject each time the system displays a different set of questions.
    e) In displaying a question, the system displays the question (statement) and its multiple choices as (a, b, c, d).
    f) User then selects an option for a particular question.
    g) If the corresponding answer is correct the user proceeds to the next question and does the same.
    h) If the provided answer is not correct then the system displays its correct answer and then proceeds to the next question.
    i) During this process, the system maintains the score of each student (you may assign some marks say 10 for each of the correct answer)
    j) Display the total score of the student.
    k) Save marks of each student for a particular quiz in the file for later use.
3. **[20 Marks] File management**
    a) Maintain text files of all the data either provided by the user or modified later on.
4. **[20 Marks] Error Handling and online Help**

a) At each level
b) If some information is not present in the database, it should display proper messages.
c) If a wrong input is entered or some mistake is being done by the user, the system should assist the user to correct that mistake.

Required Artifacts:

1. Flow charts (a separate flow chart for each module)
2. Pseudo code.

Source code.

4. Staff Management System

Purpose of this system is to manage the staff of organization. This system manages the staff, their monthly wages. This system keep track of the different resources the staff of the organization using. Following are the detail modules that need to be developed.

1. **[20 marks] Admin management**
    a. Create a admin account with login option
    b. Display the menu before the admin showing the following items
        i. Staff management
        ii. Staff salaries management
        iii. Resources management
        iv. Reports
2. **[40 marks] Implement the following modules and fit them in the above created menu.**
    a. Add staff member
    b. Update staff member
    c. Delete staff member
    d. Set basic pay of staff member
    e. Monthly salaries of staff
    f. Increment on salaries of staff
    g. Add resources
    h. Delete resources
    i. Update resources
    j. Assign resource to member

k. Report of salaries
l. Report of resources
m. Report of assigned resources
n. Assign duties to staff

3. **[20 marks] File management**
    a. Maintain files of all data
4. **[20 Marks]Error handling at each stage of the software**
5. **Artifacts**
    a. Flow charts
    b. Pseudo Code
    c. Source Code

5. Library Management System

Library management system is useful for the librarian to keep track of all the books. He can search the book in the library. This system helps the librarian to track the books that are being issued to the students or staff.

Following functionality need to be implemented for this system.

1. **[20 marks] Admin Management**

    a. Create the admin account with login module

    b. Create the menu for the admin so he can navigate easily. The menu must have the following items

        i. Staff/student management

        ii. Books management

        iii. Search

        iv. Penalties

2. **[40 marks] implement the following modules and fit them in the above created menu**

    a. Create staff member

b. Update staff member

c. Delete staff member

d. Add new book

e. Update book

f. Delete book

g. Issue book

h. Return book

i. Global book search

j. Set return rule (how many days a book can be issued. If not returned within that time per day some fixed amount will be charged)

k. Calculate penalties

l. Report of penalties

3. **[20 marks] File management**

    a. Maintain files for all the data

4. **[20 marks] error handling at each stage of the software**

5. **Artifacts**

    a. Flow charts

    b. Pseudo code

    c. Source code

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6. Police FIR Management System

Police FIR Management System aims is to facilitate the police personals to automatically handle the FIR and manage the data of the criminals. Following module must be implemented.

1. **[20 marks] Admin Management**
    a. Admin account with login module
    b. Create the menu for the admin. Menu must have following items
        i. Criminal record
        ii. FIR
        iii. Reports
2. **[40 marks] Implement the following modules and fit them in the above created menu.**
    a. Add criminal data
    b. Update criminal data
    c. Delete criminal data
    d. Issue FIR against criminal
    e. Update FIR
    f. Change status of the FIR
    g. Search criminal data
    h. FIR report

i. Criminal report

3. **[20 marks] File management**
    a. Maintain the files for the data
4. **[20 marks] Error handling at each stage of the software**
    a. Error handling at each stage of the software
5. **Artifacts**
    a. Pseudo Code
    b. Flow chart
    c. Source Code

7. Recruitment System

Recruitment system helps the recruiter to manage the process of hiring. In this system the recruiter creates the jobs and then add the different candidates (that have applied for the job) profile against the jobs. Recruiter set the interview time and also set the expected questions for the interview against the profile of the candidate. After conducting the interview, recruiter writes the remarks. Following modules need to be implemented.

1. **[20 marks] Admin Management**
    a. Create admin account with login module
    b. Create the menu for the admin with the following option
        i. Manage jobs

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ii. Manage candidates

iii. Hiring report

2. **[40 marks] implement the following functions and fit them in the above menu**
    a. Create job
    b. Update job
    c. Delete job
    d. Create candidate profile against job
    e. Update candidate profile
    f. Delete candidate profile
    g. Create questions against the candidate profile
    h. Update status of the candidate profile
    i. Create report of the hired candidates with the interview minutes
3. **[20 marks] file management**
    a. Maintain files against the data of the system
4. **[20 marks] error handling at each stage of the software**
5. **Artifacts**
    a. Flow charts
    b. Pseudo code
    c. Source code

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8. Travelling agency

Purpose of the software is to help the travel agent manage their business. Travel agent add their services and the cost of the services. Travel agent then register the customer against the different services and create invoices. Following modules need to be implemented

1. **[20 marks]**
    a. Create the admin account with login module
    b. Create the menu for the admin with the following menu items
        i. Manage services
        ii. Manage customers
        iii. Finance
        iv. Invoices
2. **[40 marks] Implement the following modules and fit them in the above menu**
    a. Add services
    b. Update service
    c. Delete service
    d. Add services cost
    e. Update service cost
    f. Register customer against the service
    g. Update the customer information
    h. Create invoice

i. Monthly financial report

3. **[20 marks] file management**
    a. Maintain the file for each type of data
4. **[20 marks] error handling at each stage of the software**
5. **Artifacts**
    a. Flow chart
    b. Pseudo Code
    c. Source Code

9. Bus Reservation System

Aim of the system is to help the transport company automate their business. They add their busses to the system. They define the routes for the different busses and the fare. Following modules need to be implemented.

1. **[20 marks] Admin Management**
    a. Create admin account with login system
    b. Create the menu for the admin with the following menu items
        i. Manage buses
        ii. Manages customers
        iii. Manage finance

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iv. Manage fares

2. **[40 marks] implement the following modules and fit them in the above menu**
    a. Add bus
    b. Delete bus
    c. Update bus info
    d. Define route for the bus
    e. Define fare for the bus
    f. Reserve the bus ticket against the customer
    g. Update reservation
    h. Cancel reservation
    i. Update bus status
    j. Create invoice
    k. Update fares
    l. Update routes
    m. Monthly financial report
3. **[20 marks] file management**
    a. Maintain the files for the data
4. **[20 marks] error handling at each step of the software**
5. **Artifacts**
    a. Flow chart

b. Pseudo Code

c. Source code

10. Railway Reservation System

Aim of the system is to automate reservation system of railway. They add their train's data to the system. They define the routes for the different trains and the fare. Following modules need to be implemented.

1. **[20 marks] Admin Management**
    a. Create admin account with login system
    b. Create the menu for the admin with the following menu items
        i. Manage trains
        ii. Manages customers
        iii. Manage finance
        iv. Manage fares
2. **[40 marks] implement the following modules and fit them in the above menu**
    a. Add train
    b. Delete train
    c. Update train info
    d. Define route for the train
    e. Define fare for the trains

f. Reserve train ticket for the customer

g. Update reservation

h. Cancel reservation

i. Update train seats status

j. Create invoice

k. Update fares

l. Update routes

m. Monthly financial report

3. **[20 marks] file management**

    a. Maintain the files for the data

4. **[20 marks] error handling at each step of the software**

5. **Artifacts**

    a. Flow chart

    b. Pseudo Code

    c. Source code

11. Point of sale

This system will help the shopkeepers automate the sale and purchase of inventory. Shopkeepers add the inventory to the system, which are updated upon sale and finance is managed automatically. Following functionality need to be implemented.

1. **[20 marks] Admin Management**

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a. Create the admin account with login module

b. Create the menu for the admin with the following menu items

   i. Inventory management

   ii. Finance

   iii. Reports

2. [40 marks] implement the following modules and fit them in the above menu

a. Add inventory

b. Update inventory

c. Delete inventory

d. Sale inventory

e. Create invoice

f. View all invoices

g. Show out of stock inventory

h. Update stock

i. Search inventory

j. Generate monthly sales report

3. [20 marks] file management

a. Maintain the files for the data

4. **[20 marks] error handling at each step of the software**

5. Artifacts

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a. Flow charts

b. Pseudo code

c. Source code