

ITCPA2-22 Assessments (2024)

Project

1. Project

Faculty:	Information Technology
Module Code:	ITCPA2-22
Module Name:	Object Oriented Programming in C#
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Total Marks:	100
Submission Week:	Week 6

This module is presented on NQF level 6.

Mark deduction of 5% per day will be applied to late submission, up to a maximum of three days.

Assignments submitted later than three days after the deadline or not submitted will get 0%. [1]

This is an individual project.

This project contributes 20% towards the final mark.

[1] Under no circumstances will assignments be accepted for marking after the assignments of other students have been marked and returned to the students.

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2. Instructions to Students

1. Please ensure that your answer file (where applicable) is named as follows before submission: **Module Code – Assessment Type – Campus Name – Student Number.**
2. Remember to keep a copy of all submitted assignments.
3. All work must be typed.
4. Please note that you will be evaluated on your writing skills in all your assignments.
5. All work must be submitted through Turnitin. The full originality report will be automatically generated and available for the lecturer to assess. Negative marking will be applied if you are found guilty of plagiarism, poor writing skills, or if you have applied incorrect or insufficient referencing. (See the "instructions to students" book activity before this activity where the application of negative marking is explained.)
6. You are not allowed to offer your work for sale or to purchase the work of other students. This includes the use of professional assignment writers and websites, such as Essay Box. You are also not allowed to make use of artificial intelligence tools, such as ChatGPT, to create content and submit it as your own work. If this should happen, Eduvos reserves the right not to accept future submissions from you.

3. Section A

Section A

Learning Objective

LO1, LO2, LO3, LO4, LO5, LO6

Technical Aspects

Visual Studio 2022

3.1. Question 1

Question 1**30 Marks**

Study the scenario and complete the question that follows:

You're part of a team responsible for developing a greenhouse monitoring system for a research facility. The system needs to track temperature variations across different sections of the Greenhouse and provide real-time data analysis to ensure optimal conditions for plant growth. As part of this project, you're tasked with implementing a temperature monitoring module to collect and display sensor data from various sections of the greenhouse.

Create a C# console application based on the information that will perform the below Prompt the user to enter the number of sections

- Prompt the user to enter the number of readings per section
- Create a 2D array to store sensor data
- Input temperature readings for each section
- Display the entered sensor data
- Perform temperature analysis (for demonstration, we'll just print a message)
- Catch and handle exceptions

(30 Marks)

End of Question 1

3.2. Question 2

Question 2

30 Marks

Study the scenario and complete the question that follows:

Metropolitan General Hospital Patient Management System

In the bustling cityscape of Metropolitan City, stands the Metropolitan General Hospital, a cornerstone of healthcare excellence serving the diverse needs of the urban population. The hospital, with its cutting-edge facilities and compassionate staff, is renowned for its commitment to providing top-notch medical care to patients from all walks of life. In the bustling corridors of Metropolitan General Hospital, the hospital management system plays a vital role in ensuring seamless patient care and efficient utilization of resources. Let's delve into a typical day at the hospital

Morning Rush As the day begins, the hospital buzzes with activity. Patients arrive at the registration desk seeking medical assistance, while doctors and nurses prepare for the day ahead. In the main lobby, a large display screen showcases the hospital management system menu, guiding patients and staff through the available options. **Admission Process** At the admission desk, hospital staff use the hospital management system to register new patients. The system prompts them to enter the patient's name, age, medical condition, and the ward they need to be admitted to. Meanwhile, in the background, the system allocates a suitable bed in the specified ward, ensuring optimal occupancy and patient flow throughout the hospital.

Specialized Care Across the various hospital wards, specialized teams of healthcare professionals provide expert care to patients. In the emergency department, trauma teams spring into action to treat critical injuries and stabilize patients in need of immediate medical attention. In the paediatric ward, child life specialists engage young patients with games and activities, creating a supportive and comforting environment for paediatric care. **Real-time Updates** Throughout the day, the hospital management system keeps staff informed of patient admissions, discharges, and transfers in real-time. Nurses and doctors can access patient records, review treatment plans, and update medical charts seamlessly using the digital interface, ensuring accurate and efficient documentation of patient care. **End of Day Reflection** As the day draws to a close, hospital administrators gather to review performance metrics generated by the hospital management system. They analyse bed occupancy rates, patient throughput, and resource utilization data to identify areas for improvement and optimize hospital operations for the days ahead.

You have been Tasked to create a console-based hospital management system in C# that will perform and have the following:

- The code defines two classes: Patient and Hospital.
- The Patient class represents a patient with properties like Name, Age, and Condition.
- The Hospital class manages patient data within a two-dimensional array representing different hospital wards.
- The Hospital class includes methods to add patients to specific wards and to display the list of patients.
- The Main method serves as the entry point and provides a menu-driven interface for users to interact with the hospital management system.

Notes:

- Creating a hospital with 3 wards, each with a capacity of 4 patients

Preview of Code outcome

Menu Entry.

```
mono /tmp/j0zjRGbDRn.exe

Hospital Management System
1. Add a Patient
2. Display Patients
3. Exit
Enter your choice: |
```

Add Patients

```
Enter your choice: 1
Enter patient's name: Thapelo
Enter patient's age: 22
Enter patient's condition: Fever
Enter ward number: 0
Patient Thapelo added to Ward 0 successfully.

Hospital Management System
1. Add a Patient
2. Display Patients
3. Exit
Enter your choice: 1
Enter patient's name: James
Enter patient's age: 45
Enter patient's condition: Flu
Enter ward number: 1
Patient James added to Ward 1 successfully.
```

Display Patients

```
Enter your choice: 2
List of Patients:
Ward 0:
Name: Thapelo, Age: 22, Condition: Fever
Ward 1:
Name: James, Age: 45, Condition: Flu
Ward 2:
```

Exit the System

```
Hospital Management System
```

```
1. Add a Patient
```

```
2. Display Patients
```

```
3. Exit
```

```
Enter your choice: 3
```

```
Exiting program...
```

```
=== Code Execution Successful ===
```

(30 Marks)

End of Question 2

3.3. Question 3

Question 3**40 Marks**

Study the scenario and complete the question that follows:

Project Management Company

The Hospital Management has decided to enhance the existing system by introducing additional functionalities. In this expanded version of the hospital management system, new features have been incorporated, including patient discharge, display of ward information, and an advanced patient search capability.

The Hospital class now includes methods for discharging patients, displaying ward information, and searching for patients by name.

- The DisplayWardInformation method provides details about the occupancy status of each ward.

(5 Marks)

- The Main method menu is updated to accommodate the new functionalities.

(10 Marks)

- Method to discharge a patient from the hospital

(10 Marks)

- The SearchPatient method allows users to search for a patient by name across all wards.

(15 Marks)

Incorporate the new features by implementing and working on the previous system for modification using C#

Source: Moyo T. 2024

Preview

Display Menu

```
Hospital Management System
1. Add a Patient
2. Display Patients
3. Discharge a Patient
4. Display Ward Information
5. Search for a Patient
6. Exit
Enter your choice: |
```

Current Patients

```
6. Exit
Enter your choice: 2
List of Patients:
Ward 0:
Name: Thabiso, Age: 22, Condition: Fever
Ward 1:
Name: Smith, Age: 35, Condition: Flu
Ward 2:
```

Discharge Patient

```
Enter your choice: 3
Enter patient's name to discharge: Thabiso
Patient Thabiso discharged from Ward 0.

Hospital Management System
1. Add a Patient
2. Display Patients
3. Discharge a Patient
4. Display Ward Information
5. Search for a Patient
6. Exit
Enter your choice: 2
List of Patients:
Ward 0:
Ward 1:
Name: Smith, Age: 35, Condition: Flu
Ward 2:
```

Search Patient

```
Enter your choice: 5
Enter patient's name to search: Thabiso
Patient Thabiso not found in any ward.
```

Hospital Management System

1. Add a Patient
2. Display Patients
3. Discharge a Patient
4. Display Ward Information
5. Search for a Patient
6. Exit

```
Enter your choice: 5
Enter patient's name to search: smith
Patient smith found in Ward 1.
```

(40 Marks)

End of Question 3