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Abstract

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C# Weekend Assignments

[Document subtitle]

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Assignment 1

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Aptean University located at Golden Heights Rajajinagar,Bangalore is providing training on Computer science consisting of five subjects(C,Database,Comp.Arch, OOPS, Comp. Networks).

Students can enroll for this program as a day time scholar or part time scholar. At the end of the training, exams are conducted on the five subjects and scored.

Aptean University needs a software that could

1. Enroll students to their university. Once the student has successfully enrolled, A student relationship department is notified to provide a Student Beginer kit.

2. Record scores obtained for every student.

3. Display the exam result in the below given format

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College Name:

Address Line1:

Address Line2:

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Student Name DOB StudentType C Database Comp.Arch OOPS Comp.Networks Avg.Score

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<FirstName LastName> 1/1/2000 Day xxx xxx xxx xxx xxx xxx

<FirstName LastName> 1/1/2000 Day xxx xxx xxx xxx xxx xxx

<FirstName LastName> 1/1/2000 Day xxx xxx xxx xxx xxx xxx

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Software would be handled by the operator who would feed student enrolment information and score information into the system.

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Software Behavior

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Software prompts used to input College Name

Software prompts used to input Address Line 1

Software prompts used to input Address Line 2

Software prompts used to input No of student enrolled

For every student

Software prompts used to input First Name, Last Name, DOB

After exams Operator decides to input scores for every student

For every student software accepts the marks scored in each subject.

On operator issuing print result. Above tabular report is printed.

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Constraints

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College Name, Address Line 1 is a mandatory field to entered by the operator

Student FirstName and DOB to be mandatory field

Validate DOB to be not more than 120 yrs.

Validate the scores entered by the operator is between 0 and 100

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What is expected?

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Program written in Object Oriented approach.

Create college Class

Create Student Class

Create SudentType Enum

Create Subjects Enum

Create SubjectScore as a Struct

Appropriate validations/Rules are handled

Exceptions are graciously handled

Clean code recommendations are practiced.

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Concepts Covered

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Creating class, struct, enum

Access modifiers

Basic programming constructs

Exception handling

Clean code

Assignment 2

You as a product developer has successfully developed the product as described in assignment 1. This was well received from Aptean University.

Your company has approached Takshasheela University to use this product. They are happy with the features but they have requested that the result display is not

in the format as they need. They need to display the result in the below format instead for every Student

----------------------------------------------------------------------------------------------------

College Name:

Address Line1:

Address Line2:

----------------------------------------------------------------------------------------------------

Student Name : <FirstName LastName>

DOB :

StudentType :

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Score

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C

Database

Comp.Arch

OOPS

Comp.Networks

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Avg.Score

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You are expected to alter the code such that software supports both the formats. Depending upon the configuration one of the format is displayed.

This way Aptean University / Takshasheela university result is displayed in the format as they expected.

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What is expected?

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seperate classes are created for each ResultDisplayFormat derived by a common interface. One of the class object is instanciated depending on the configuration and injetced into class that calls print functionality.

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Concepts Covered

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Interfaces

Dependency Injection

Reading config value from configuration files

# Assignment 3

Universities have numerious books on various topics. Few books cater for more than one topic. Students are finding it hard to search through the library for the book they could refer for their reading on a particular topic.

If the book is already been taken by any other student, then the student wont even know that there is a book that exactly has the information he/she is loking for. If a student is lucky to find a book, he would get it to librarian to

to borrow it for 2 weeks. Librarian would keep a borrow card per book to track the books borrowed. On the contrary if a student figures it out that the book is already been borrowed, he could register with the librarian to be in queue to

be the next person to pick up the book as soon as it is returned. Today all these activities are carried out using hard copy(borrow cards/books).

Our Product Manager in the company has done the market analysis and narrowed down that a new module to digitize the library management would help all the universities using their application to better manage and track their library activity.

You are assigned to build this new module into the system.

1. There should be provision for librarian to add the list of books currently in the library to the application. Provision a way to add book details (BookId[Unique Id for every book],Title,Autor, List of topics the book cover).

2. There should be provision for students to browse all the availabe books for a particular topic that he enters. To help them easily browse through, the books needs to be sorted by title before displaying.

3. If a book is already borrowed, students could register to borrow the book with the librarian when next available. Once the book is returned, librarian would pick the next student(from the list of students waiting in queue) to pick the book and notify them.

Create Book Class with property BookId, Title, Author, Topic

create library containing books.

Library maintains a borrow card per book. This borrow card tracks every student who borrowed the book in the past and current (student id who borrowed, when borrowed, when returned).

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What is expected?

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Create library class

create book class

create borrowCard class

create borrowCardItem class

use Dictionary<bookId,borrowCard> to store

Use SortedList<Book> to sort by title and display

Use Dictionalry<bookid,Queue<Student>> to track students waiting for a book and notify

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Concepts Covered

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Using built in generic classes

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Assignment 4(Delegates and Events)

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Over the day's the application has grown to provide different modules for helping different departments in the college like student relationship dept.,startionary dept., System Admin dept.

University is now planning to (a) provide stationaries to their students as soon as they join along with starter kit. (b) Provide one desktop environment in the lab dedicated to each student.

This requirement needs to be streamlined and well coordinated among depts. as startionary is provided by startionary dept., system provisined by System Admin dept., starter kit by student relationship dept.

To do this Product Manager is requesting you to Notify all the depts. on new student enrolment thereby they can provide all neecssary kits and env.

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What is expected?

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Create RelationshipDept class

Create StationaryDept class

Create SystemAdminDept class

Create StudentEnrolledDelegate

Create OnStudentEnrolled Event

All Dept. to register for the event. On student enrolemnt trigger OnStudentEnrolled Event

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Concepts Covered

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Delegates and Events

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Assignment 5(Delegates and Events)

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In the earlier requirement students received starter kit, stationary kit and dedicated computer env. in the lab. This was automatically provisioned when students enrolled. Univerasity has now started charging for the stationary kit students receive.

This made some students raise their concerns that they do not need the stationary and they are paying unnecessarly for it. This has drawn the attention of the management and have made stationary kit an optional item to be choosen during enrolment.

Hence you are asked to do the changes in the system so that if a student has optedout of stationary during enrolemnt, no stationary kit is provided to the student.

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What is expected?

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Pass Student object as a argument when a event is raised.

In the StationaryDept event handler make a check to see if student has enrolled. If so then provide a kit.

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Concepts Covered

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Delegates and Events

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Assignment 6

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Unzip file Assignment\_6.zip. This is a solution that contains code to serialize/deserialize Student and Book objects. Class XMLSerializerWrapper is the one responsible for performing this job.

There is a problem in the way the functionality is implemented. What is the problem? How would you alter XMLSerializerWrapper class to achieve same functionality.

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What is expected?

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Refactor code to make serialize/deserialize methods become generic methods that accepts any object to serialize/deserialize them.

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Concepts Covered

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Implementing generic methods.