Students are required to
- Complete and upload software project and the related documents to moodle2021.vtc.edu.hk
- Hand in a hard copy report to the drop-in box outside IT Departmental Office at C440 (Attention to Lecturer: Jesse Shum)

Date of Submission: On or before ***2020-Dec-4 4:30 p.m.***

Students are required to submit your work in Moodle platform and demonstrate your assignment during lab session. Late assignment submission will **NOT** be allowed. The late assignment will score a **Zero** mark.

A. Scenario

The Institute of Vocational and Professional Education and Training (IVPET) is seeking for IT consultants to digitalize the equipment borrowing process. Currently, students are required to go to the technician room to check for the availability and do the borrowing of equipment. All borrowing records are written down on a notebook. The handwritten records are error-prone and it is difficult for technicians to check up overdue items. Also, it is hard for senior technicians to check the utilization rate of each equipment. Therefore, the current method is considered inefficient. A computer system can improve the borrowing process, offer real-time record check-up and generate real-time statistic reports.

The new equipment reservation and borrowing system should be implemented where the system provides inventory management, equipment borrowing, monitoring, tracking and reporting features. This system will be a web-based system with a user-friendly GUI to support Senior Technician (Administrator), Technician and Student. Their usages of the system are identified as follows:

- Student: equipment reservation, check personal borrowing records
- Technician: inventory management, handle check-in/out of equipment, lookup overdue items
- Senior Technician: check the analytic & report, account management

The system should record the procedures in a typical equipment borrowing and return scenario. Students use the system to make a reversion request on the available equipment. They can reserve multiple pieces of equipment on one request. After received reversion requests, the technicians prepare the reserved equipment to pick up and use the system to confirm the equipment reservation. The reservations records are updated and notify the student for ready of pick-up. When the requested equipment is ready to pick up , the student comes to the equipment room with the reservation information to pick up the reversed equipment. Check-out records will be maintained for the equipment borrowed by students. Each record has specified a loaned period.

When students return the equipment, a student brings equipment to the equipment room. Technicians use the system to searches for the check-out items with either the equipment id or student id. The technicians use the system to update the check-out record of the student. The system will update the availability of the equipment and student record respectively. Students can find their loan equipment has been returned in their profile. Besides, the system should notify students and technicians if any overdue loaned equipment.

Senior Technicians periodically check the equipment usage and report them to school. They need to make sure the students return the equipment with the loan period. Besides, they are also responsible for maintaining the student profile. E.g. Creation of user profile when new students join the school.

You will form a team to complete the following functional requirements.

B. Function Requirement

Inventory Management

- Show a list of all equipment
- Add / edit / delete equipment
- Enable/disable listing of equipment on borrowing system
- Confirm/decline borrowing request
- Handle equipment check-out / check-in

Equipment Borrowing

- Show a list of equipment and related features (e.g. description, availability status)
- Send borrowing request / check borrowing request status
- Overdue alert
- Check personal borrowing record

Analytic / Report

- Show a list of borrowing records of the selected student (s)
- Show the utilization rate of selected equipment (calculated by month/year)
- Show the list of overdue items (Technician can check out this feature)

Account Management

- Show a list of existing users
- Create and delete users
- Edit users with detail and roles
- Manage the user role

Extra Feature

You are encouraged to work on the extra features to score bonus mark, for example,

- Show statistic using graphs
- Show recent borrow item
- Keywords search e.g. top search item
- Item tagging for quick search

C. Project Requirement

According to the scenario above, you are required to design and develop a web application with Java EE 7.0 features to solve the above background needs. You are required to form one project group with **2 members**. Each student will specify his/her part of the individual work.

Students should share the workload evenly. The group should list down work done by each student.

Work break down	Student 1	Student 2
	50%	50%

The project will be marked according to the following criteria.

Skills requirements
    a) Use JSP/servlets to dynamically generate HTML pages
    b) Use JSP/servlets to accept user inputs from browser
    c) Use JSP Action
    d) Use Custom Tag (Taglib).
    e) Use JavaBean
    f) Use JDBC for database connection
    g) Use session checking
    h) Use login control
    i) Apply the MVC model
    k) Other skills applied

Functionalities and Web design
    a) Complete the user requirements
    b) Consistent design and easy to use
    c) Smooth navigation with the application
    d) Tidy Page Layout with logical and related graphics
    e) Error-free implementation
    f) Creativity

Report and Presentation

*Note: * Please note that you will be asked to recompile all your Java classes during the demonstration, and to answer questions regarding your implementation.*

D. Guideline

Plagiarism

The submitted assignment must be the group's own work done and finished solely by the group members. Plagiarism will be treated seriously. Any assignments that are found involved wholly or partly in plagiarism (no matter the assignments are from the original authors or from the plagiarists) will score Zero mark.

Submission of Assignment Work

1.   The front page of your submission should include the course title, module title, student identity
2.   number, student name, and group number.

3.   A written report should include the followings:
   a) Assumption and the user and system requirements
   b) Site map
   c) System structure on how MVC Model is applied
   d) Database structure
   e) Brief description (1 or 2 pages only) on the major characteristics and design of your application
   f) Conclusions
   g) Skill checklist which lists your used skills (or technologies) in a single page. and highlights the skills and technologies applied in your project

4.   Upload all related documents and software project to moodle1819.vtc.edu.hk on or before the deadline.

5.   You are required to demonstrate your assignment. You will fail this module if you do not demonstrate the assignment in the lab session as required.

- The End -