Assignment 2 - My Virtual Factory

In this assignment, we will perform a virtual factory automation. Our virtual factory creates production orders according to the orders they receive. Its production order is planned on machines within the factory according to sub-operations in a production and a schedule is planned. The next level should be planned after the sub-operations are finished in the schedule for the product to emerge. Necessary data tables are provided for the identification of the system. The first column of each table is in the Primary Key property. In other tables with the same name, the real fields are in the ForeignKey property.

Tables:

Customers (customer_id, name, password): It is the table where customer information is stored.

Users (user_id, name, password): It is the membership information of the factory personnel that is kept for entering the system.

Orders (order_id, customer_id, order_date, deadline): It is the order information that customers send to the system. For each order information, the date of issue and termination, which is given by the user, is given.

OrderItems (order_item_id, order_id, product_id, amount): The order placed is pocketed from multiple items. Each order item stores information about a product and how much it is wanted to be produced.

Products (product_id, product_name, product_type, is_salable): The names of the products and plants are given in this table. Also, whether the product is a sub_product (intermediate product) is determined by the salable field. They can only view salable items.

SubProductTree (sub_product_id, product_id, amount): The sub-view required to produce a product and how many units of the child product per unit of product will be given in this table. A product production tree reviews from multiple levels. This table only holds one level relations. Ultimately, the product tree for which a product_id will be defined for one of them is kept in the form of multiple records in this table. For a product production, this table must be scanned and production orders must be generated if there is no production in the required sub-available stock.

Operations (operation_id, operation_name, product_type): This table will store the list of operations required to produce each product type.

WorkCenters (work_center_id, work_center_name, active): It is the table where the records of the machines in the factory are kept. It will determine whether this machine will be used in job planning as the active area as boolean.

WorkCenterOperation (wc_opr_id, work_center_id, operation_id, speed): Making a job base (machine) a job type (product / min) shows in the speed field. If there is no machine definition in this table for the relevant job type, this operation cannot be done. The user is alerted at this time. If there is more than one record for a job type, this job type can accomplished on more than one machine. The opposite means that a machine can do more than one job type.

Apart from these, it is up to the students how to create the tables that will keep the planning data. All times in the system will be defined in minutes and all units will be defined in meters or kg. In the above tables, you can add the columns that must be added for functionality.

Features of the Program:

1. Customers and personal will log into your application from different login screen.

2. Customers will be able to create a basket defined in the system and place an order in client sessions. They will indicate the deadline they want in their orders. There can be more than one order item in an order.

3. Customers will be able to follow up the status of orders that have been placed before.

4. The staff will see the main prompt as summarized graphically on a dashboard.

    a. Orders - according to their condition

    b. Machines - job queues - availability

    c. Deadline misses, etc.

5. Staffs will be able to define system definitions, products, production tree, machines, operations, machine - operation - product relations systems.

6. When the staff wants to plan an order, they will be able to plan the order according to the empty time slots of the machines in accordance with the order.

7. Staff will be able to change the time slot of operations planned on one machine or transfer it to another machine capable of performing this work. This transfer process will be made by considering the conditions of the previous and the next operation in the product tree, such as the harmony of the processing time on the machine. If other operations in the product tree need to be shifted, the process should be tested for suitability.

Issues Related to Project Delivery and Group Work:

1. The project's executable project folder, a “video.txt” file containing the path to the video describing the project's running screens, coding structure and critical code blocks should be submitted as a single zip file named with your student number. (In the form of 1306000001.zip. In group submission assignments, both student numbers must be mentioned in the name. 1306000001-13060000002.zip)
2. Homework can be done alone or in a group of 2 people.
3. A video shooting should be made, taking care not to exceed 10 minutes, in which the working version of the homework is explained and the codes of the student will be found. For this video shoot, you can create a recording by holding a meeting on Google Meets or Microsoft Teams, or you can record on your personal computer with OBS Studio. In the assignments made as a group, both students should be seen in the narration.

Other Remarks:

1. Mobile technologies or alternative technologies shown in the lesson should be used in the homework.
2. In homework, apart from the coding of the pages where the basic operations are performed, the details of the interface and the visualization graphic supports are left to the students' imagination.
3. Make your project with a template that complies with Material Design rules.
4. The project must establish a connection to a remote server. You can set up a structure that communicates with FireBase or a web service you have written.