**Advanced Databases and Modelling (2024/2025)**

**Coursework 1 (Class Diagram) - Build U Like Class Diagram**

**Group Assignment**

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# **Class Diagram**

**A diagram of a computer program

Description automatically generated with medium confidence**

## **Attributes & Operations - Classes**

**A screenshot of a computer program

Description automatically generated**

## **Attributes & Operations - Association**

**A screenshot of a computer screen

Description automatically generated**

### **Class Diagram Explanation:**

Each project is specifically associated with a single customer, and a customer may have more than one project. There is a supervisor for every project who assigns staff and supervises tasks. There are several tasks that are specific to a project. Tasks are given to staffs, who may be given multiple tasks for several projects. Material\_Task records how much of each material is utilised and associates it with tasks. Staffs are assigned jobs based on labour records, and each staff works a certain number of hours. Multiple types of materials can be supplied by suppliers, and one or more suppliers supply every material. Specialists are given specific jobs to complete inside a project, and they decide how much each work will cost.

#### **Assumptions & Constraints for the classes**

1. **Customer**

**Assumption**: Even after finishing all their projects, a customer remains in the system.

1. **Project**

**Assumption**: Every project has a supervisor and has connections to particular tasks.

**Constraints**: A supervisor must always be assigned to a project.

1. **Supervisor**

**Assumption**: There must be one supervisor for every project.

1. **Staff**

**Assumption**: Staffs may be assigned to several jobs on various projects. Once assigned, staff cannot be rescheduled.

**Constraints**: The staff is assigned based on their level and area of expertise.

1. **Task**

**Assumption**: The tasks are organised, and the schedule is followed exactly (no reassignments, no delays, etc.).

**Constraints**: Every task has an allocated timetable, including a start date and end time. The same staff and supplies are always assigned to it.

1. **Material**

**Assumption**: There is no need to dynamically monitor material levels because the system believes that the amount of material used in a task is accurately estimated.

**Constraints**: Although materials are utilised in tasks and are connected to suppliers, material levels are not dynamically maintained in this scenario.

1. **Material\_Task**

**Assumption**: At the beginning of the project, the amount of material required is always accurately estimated and stays unchanged.

1. **Labour**

**Assumption**: Each staff's hourly rate is set and remains unchanged throughout the project.

**Constraints**: The wage rate and the number of hours performed by the staff determine the labour costs.

1. **Supplier**

**Assumption**: To keep things simple, it is expected that the company would always have enough supplies on hand for each project.

1. **Specialist**

**Assumption**: Specialists perform specialised tasks (such as installing fountains) and charge for them.

**Constraints**: For budget considerations, specialised tasks are handled differently from regular internal tasks.

1. **Specialist\_Task**

**Assumption**: Both the task and the materials used for specialist tasks have external costs, which are determined by the specialist.

**Constraints**: While the corporation manages materials for in-house tasks, the specialist handles the task's material and cost specifics.