Sample Problem 1: School Results Application

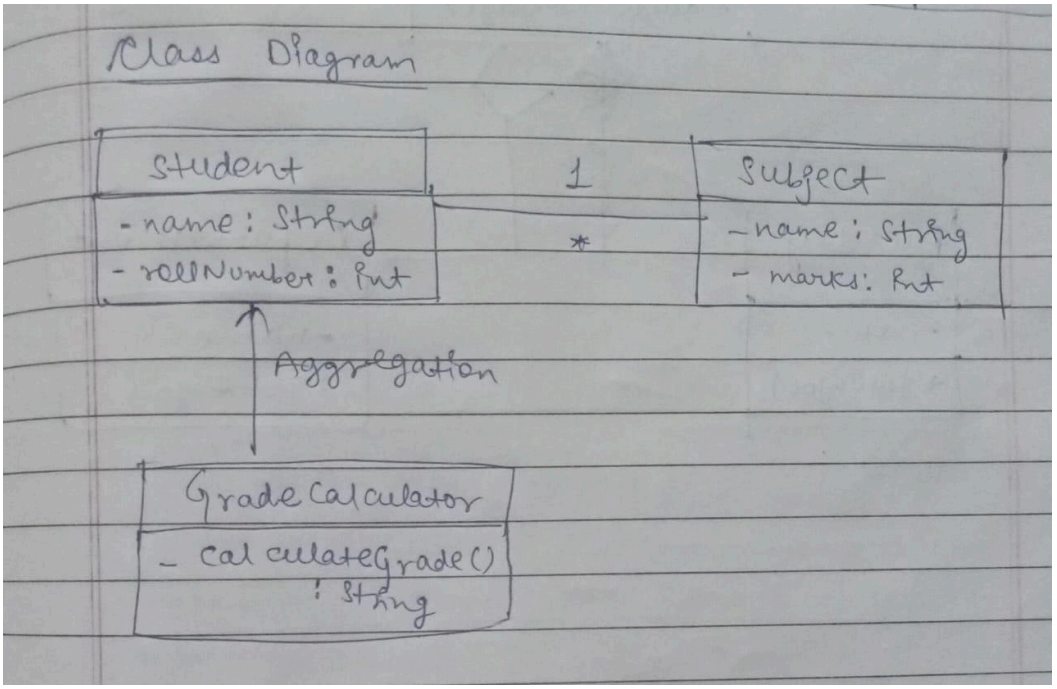
Class Diagram

The class diagram represents the structure of a school results application where students have subjects, and their scores are calculated for grades.

Diagram Description:

- **Classes**: `Student`, `Subject`, `GradeCalculator`
- **Relationships**:
  - A `Student` has multiple `Subject` entries (Aggregation).
  - `GradeCalculator` computes the results for a `Student`.

→ Draw the Class Diagram



Object Diagram

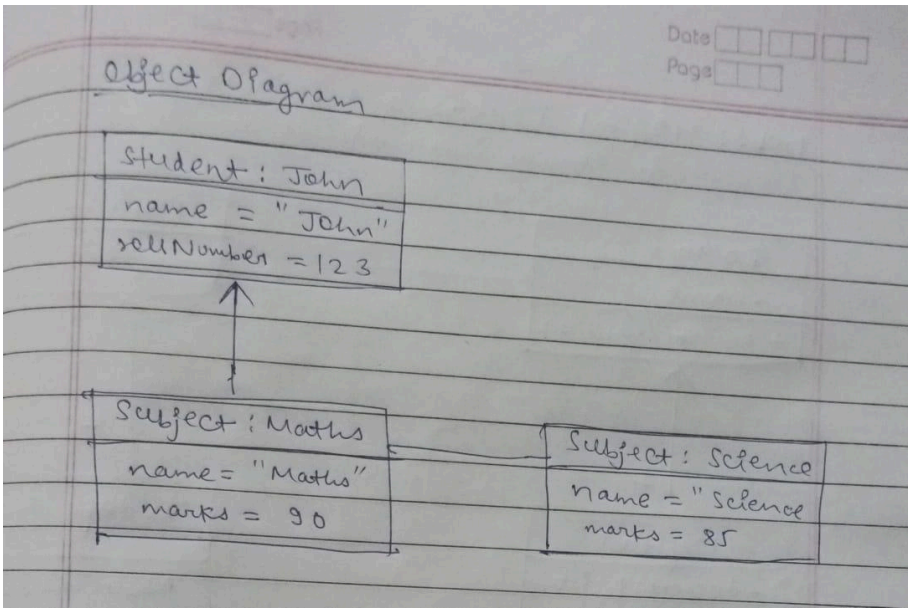
An object diagram provides a snapshot of the `Student` and their `Subject` objects at a particular point.

Example:

- **Student**: John

- **Subjects**: `Maths`, `Science`
- **Marks**: `90`, `85`

→ Draw the Object Diagram



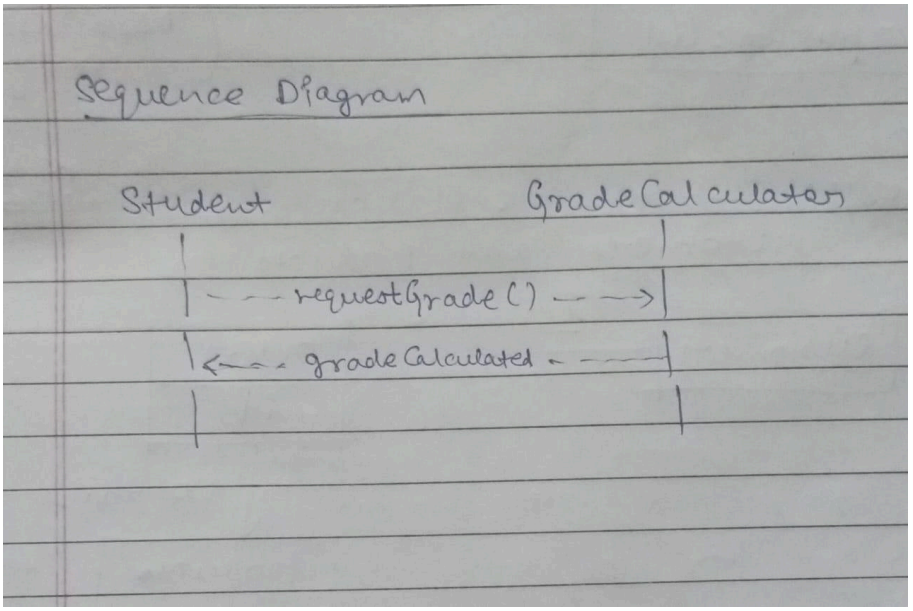
Sequence Diagram

The sequence diagram shows how objects interact to calculate grades.

Scenario: A student requests their grade based on marks in subjects.

Actors:

1. `Student`
2. `GradeCalculator`



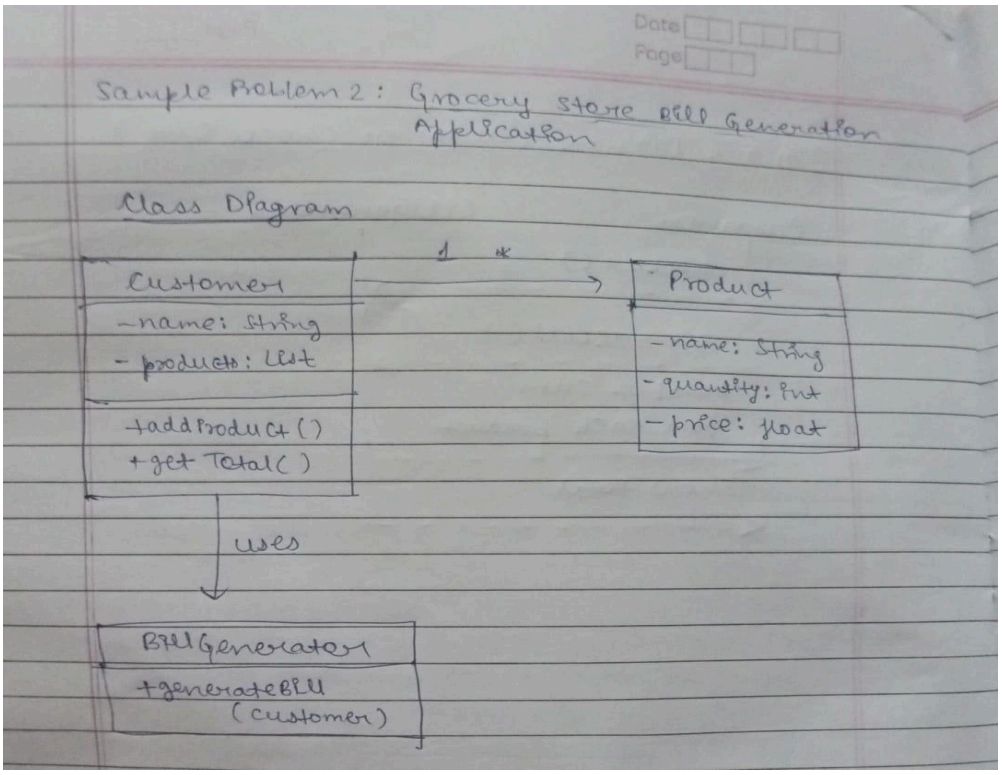
Sample Problem 2: Grocery Store Bill Generation Application

Class Diagram

The class diagram models the system where a customer buys products, and the bill is generated.

Diagram Description:

- **Classes**: `Customer`, `Product`, `BillGenerator`
- **Relationships**:
  - A `Customer` can purchase multiple `Product` items (Composition).
  - `BillGenerator` computes the total for the `Customer`.

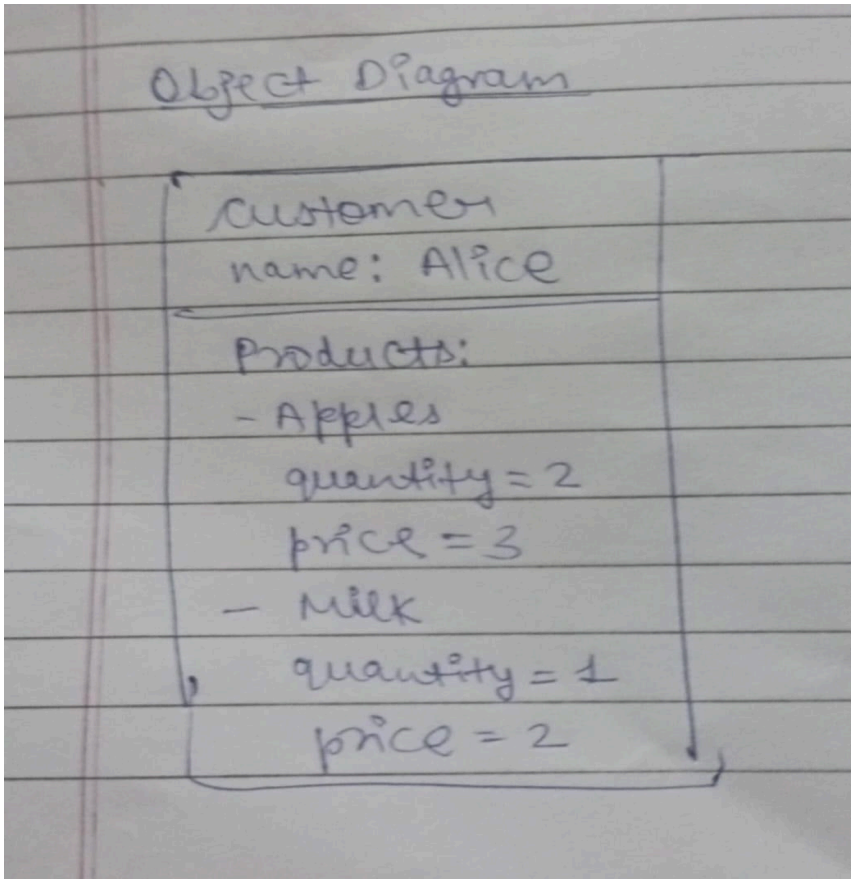


Object Diagram

An object diagram shows the details of a `Customer` and the `Product` objects they have purchased.

Example:

- **Customer**: `Alice`
- **Products**:
    - `Apples` (2 kg at $3 per kg)
    - `Milk` (1 liter at $2 per liter)



Sequence Diagram

The sequence diagram shows the process of bill generation for a customer.

Scenario: A customer checks out at the grocery store, and the total bill is generated.

Actors:

1. `Customer`
2. `BillGenerator`

→ Draw the Sequence Diagram