📊 DIAGRAMMES DU PROJET SGU

Système de Gestion Universitaire - ING3 IA 2025/2026

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1. ARCHITECTURE MVC

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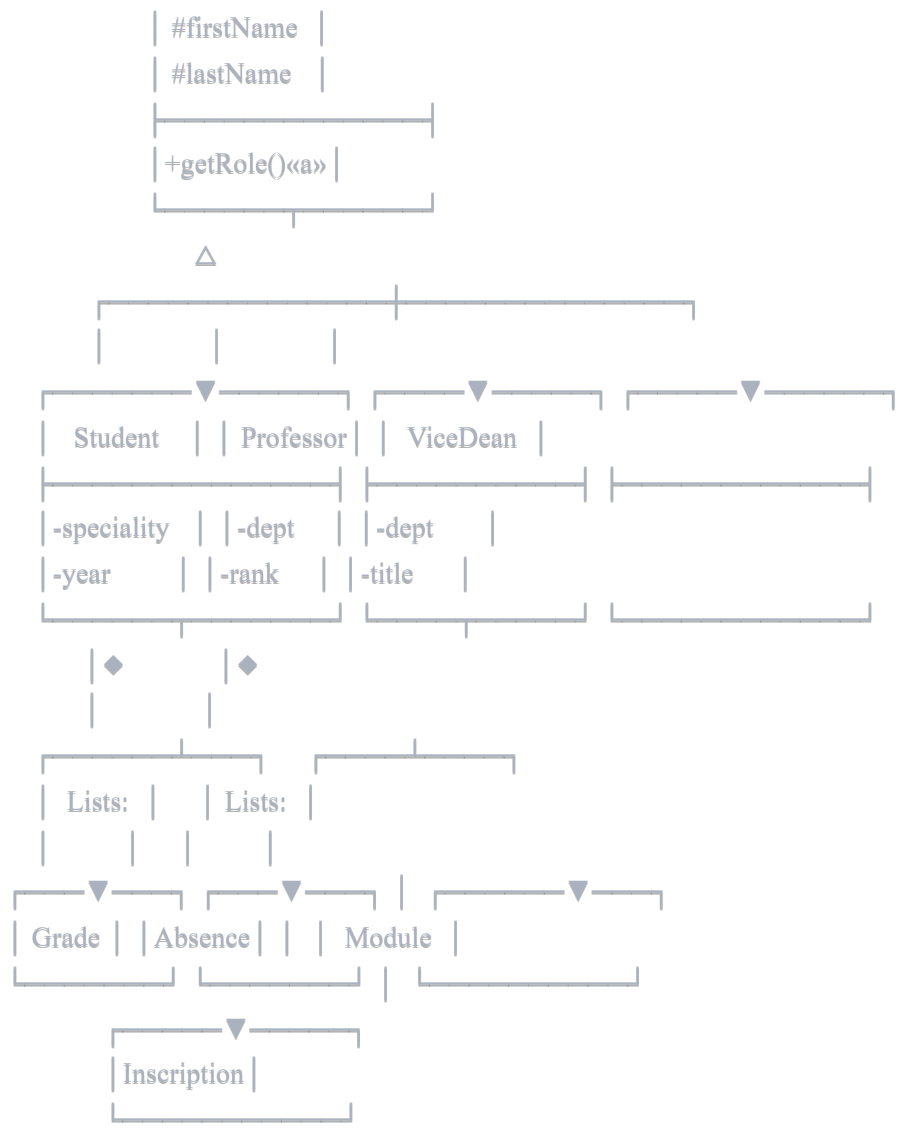
2. DIAGRAMME DE CLASSES



Légende:
△ = Héritage
◆— = Composition (appartient à)
◇— = Agrégation (utilise)

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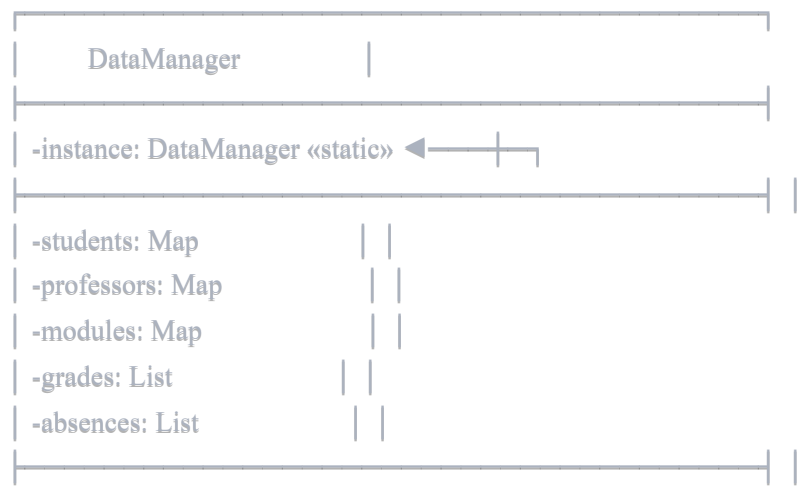
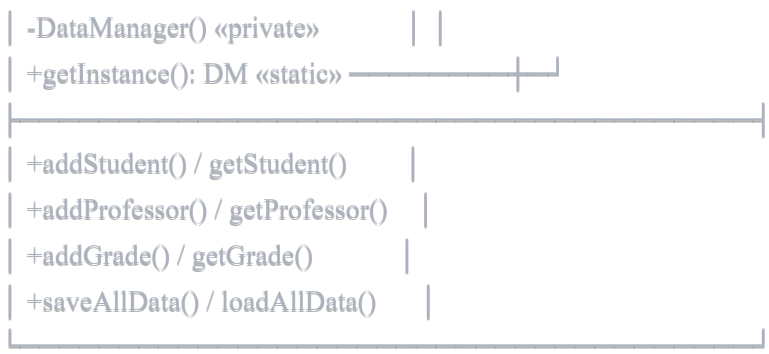
3. PATRON SINGLETON





CARACTÉRISTIQUES:
✓ Constructeur privé
✓ Instance unique statique
✓ Méthode getInstance() publique
✓ Thread-safe (synchronized)

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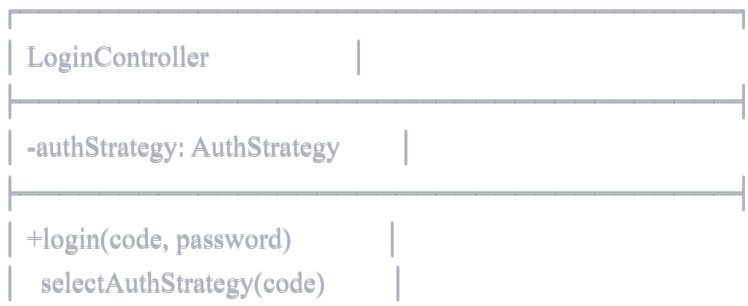
4. PATRON STRATÉGIE

UTILISATION (LoginController):



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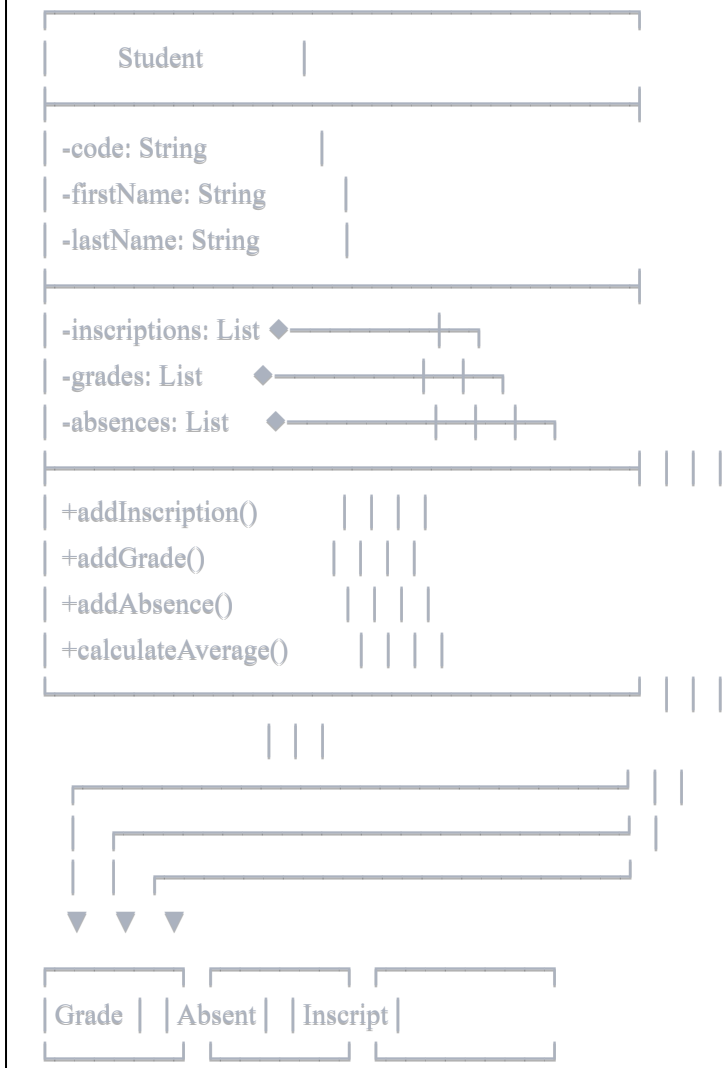
5. PATRON COMPOSITION



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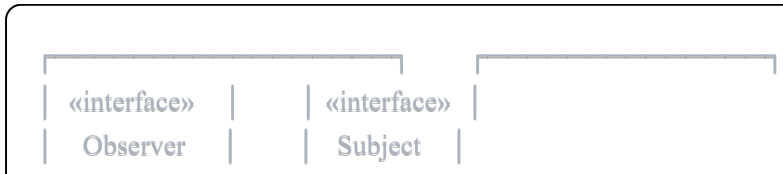
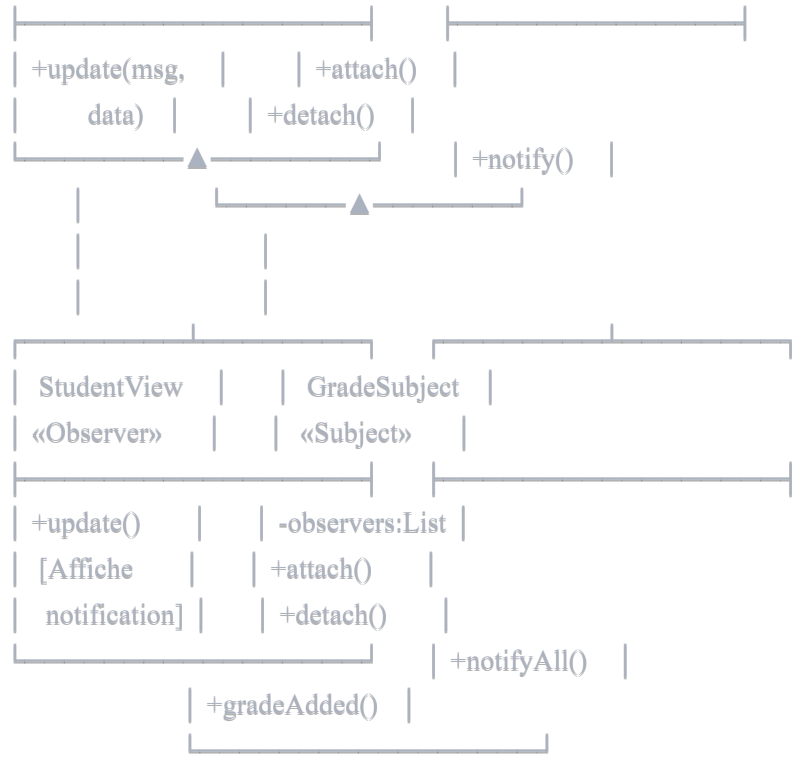
6. PATRON OBSERVATEUR





FLUX D'EXÉCUTION:

Professor → ProfController → DataManager

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gradeSubject.gradeAdded()

↓

notifyObservers()

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studentView.update() → [Popup!]

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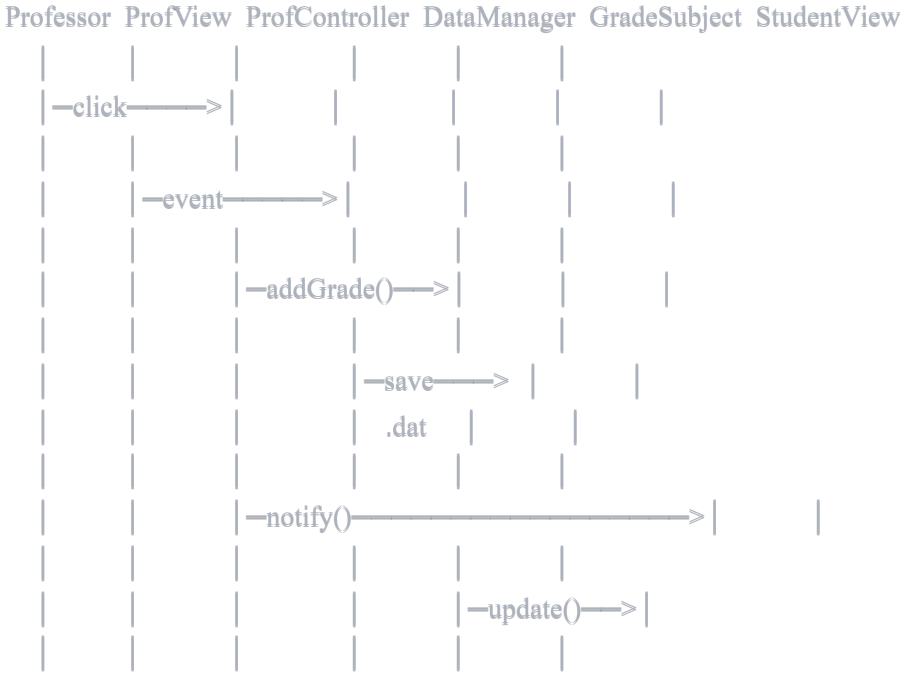
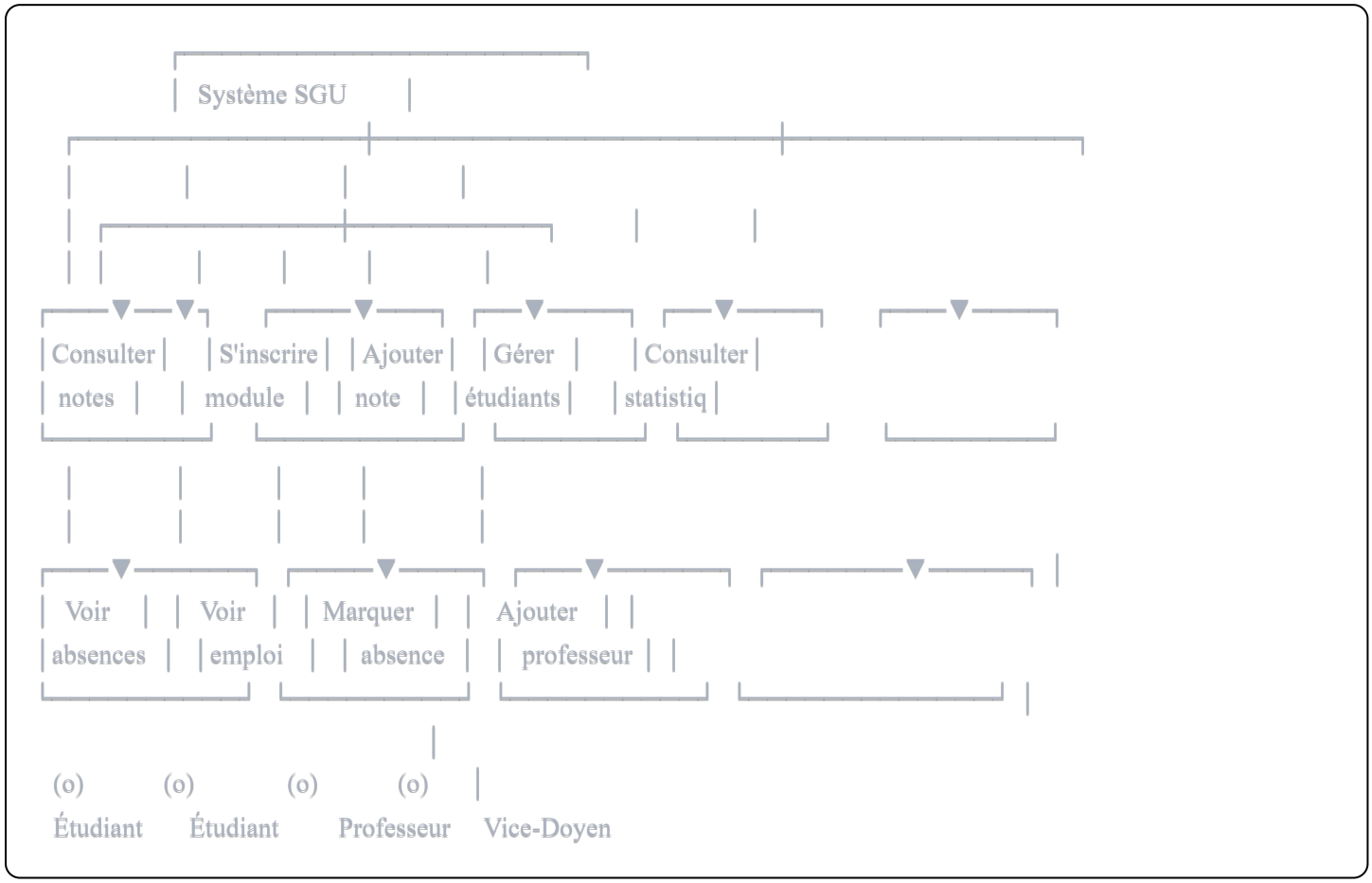
7. SÉQUENCE: AJOUT D'UNE NOTE



8. CAS D'UTILISATION



9. STRUCTURE DES FICHIERS

```
data/
├── students.dat      ← Map<String, Student>
├── professors.dat    ← Map<String, Professor>
├── vicedeans.dat     ← Map<String, ViceDean>
├── modules.dat       ← Map<String, Module>
├── grades.dat        ← List<Grade>
├── absences.dat      ← List<Absence>
└── inscriptions.dat  ← List<Inscription>
```

CODES D'IDENTIFICATION:

Type	Format	Exemple

Étudiant	1XXXXXXX	12345678
Professeur	2XXXXXXX	23456789
Vice-Doyen	3XXXXXXX	34567890

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10. RÉCAPITULATIF DES PATRONS

SINGLETON - DataManager

Problème: Données dupliquées partout
Solution: UNE instance unique pour tout gérer
Fichier: `model/dao/DataManager.java`

STRATÉGIE - Authentification

Problème: If/else en cascade
Solution: Une stratégie par type d'utilisateur
Fichiers: `strategy/*.java`

COMPOSITION - Student/Professor

Problème: Relations complexes
Solution: Objets qui possèdent d'autres objets
Fichiers: `model/entities/Student.java`

OBSERVATEUR - Notifications

Problème: Communication entre composants
Solution: Notification automatique
Fichiers: `model/observers/*.java`

FIN DU DOCUMENT

Projet: Système de Gestion Universitaire
Année: 2025/2026
Module: GL - ING3 IA
Date limite: 18/12/2025

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