**Student Management System**

**CQ1: Which students are enrolled in the course “CS101”?**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?studentName WHERE {

?c a sm:Course ;

sm:courseID "CS101" ;

sm:hasEnrollment ?enr .

?enr sm:hasEnrollment ?stu .

?stu sm:studentName ?studentName .

}

**CQ2: List all courses offered by the “Computer Science” department.**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?courseName WHERE {

?d a sm:Department ;

sm:departmentName "Computer Science" .

?c a sm:Course ;

sm:offeredBy ?d ;

sm:courseName ?courseName .

}

**CQ3: Which professors teach “Data Structures”?**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?profName WHERE {

?c a sm:Course ;

sm:courseName "Data Structures" ;

sm:teaches ?prof .

?prof sm:professorName ?profName .

}

**CQ4: What grade did student “Alice” receive in “CS101”?**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?gradeLetter WHERE {

?stu a sm:Student ;

sm:studentName "Alice" ;

sm:hasEnrollment ?enr .

?enr sm:enrolledIn ?c ;

sm:hasGrade ?g .

?c sm:courseID "CS101" .

?g sm:gradeName ?gradeLetter .

}

**CQ5: Which courses does student “Alice” attend in semester “Fall2024”?**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?courseName WHERE {

?sem a sm:Semester ;

sm:semesterName "Fall2024" .

?c sm:scheduledIn ?sem ;

sm:courseName ?courseName .

?stu sm:studentName "Alice" ;

sm:hasEnrollment ?enr .

?enr sm:enrolledIn ?c .

}

**CQ6: List all students who obtained an “A” grade (i.e. grade A).**

PREFIX sm: <http://www.example.org/student-management#>

SELECT DISTINCT ?studentName WHERE {

?g a sm:A .

?enr sm:hasGrade ?g ;

sm:hasEnrollment ?stu .

?stu sm:studentName ?studentName .

}

**CQ7: Who is the guardian of student “Bob”?**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?guardianName WHERE {

?stu sm:studentName "Bob" ;

sm:hasGuardian ?g .

?g sm:guardianName ?guardianName .

}

**CQ8: What is the full address of student “Charlie”?**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?addressLine WHERE {

?stu sm:studentName "Charlie" ;

sm:livesAt ?addr .

?addr sm:addressLine ?addressLine .

}

**CQ9: Which classroom is “CS101” scheduled in?**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?room WHERE {

?c sm:courseID "CS101" ;

sm:scheduledIn ?sem ;

sm:attendsClassroom ?roomURI .

?roomURI sm:classroomName ?room .

}

**CQ10: List all professors in the “Mathematics” department.**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?profName WHERE {

?d sm:departmentName "Mathematics" .

?prof sm:belongsTo ?d ;

sm:professorName ?profName .

}

**CQ11: Which students are undergraduates?**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?studentName WHERE {

?stu a sm:UndergraduateStudent ;

sm:studentName ?studentName .

}

**CQ12: Which students are postgraduates?**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?studentName WHERE {

?stu a sm:PostgraduateStudent ;

sm:studentName ?studentName .

}

**CQ13: For each course, how many students are enrolled?**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?courseName (COUNT(DISTINCT ?stu) AS ?numStudents) WHERE {

?c a sm:Course ;

sm:courseName ?courseName ;

sm:hasEnrollment ?enr .

?enr sm:hasEnrollment ?stu .

}

GROUP BY ?courseName

**CQ14: Which courses currently have no enrollments?**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?courseName WHERE {

?c a sm:Course ;

sm:courseName ?courseName .

FILTER NOT EXISTS {

?c sm:hasEnrollment ?enr .

}

}

**CQ15: Which courses did Professor with ID “P123” teach in “Spring2025”?**

PREFIX sm: <http://www.example.org/student-management#>

SELECT ?courseName WHERE {

?prof sm:professorID "P123" ;

sm:teaches ?c .

?c sm:courseName ?courseName ;

sm:scheduledIn ?sem .

?sem sm:semesterName "Spring2025" .

}