

Lab work 1

Task 1.

Relation A

1. EmpID, SSN, Email, Phone, (EmpID, Name),
(SSN, Department)
2. EmpID, SSN, Email, Phone (In our example
it is unique, but in real life several employees
may have one number, for example, a common work
phone)
3. EmpID - because it cannot be NULL and stable.
4. In our data, no, but in real life, yes.

Relation B

1. Primary key: Student ID

Minimum attributes: CourseCode, Section, Semester,
Year.

2. All attributes are related and necessary

Student ID → Without it, we don't know who
is registering

CourseCode + Section → Without them, we don't
know which section of the course he's taking.

Semester + Year → Allows you to distinguish time, semesters of disciplines.

3. (Student ID, CourseCode, Section, Semester, Year)

Task 1.2.

Foreign key:

Enrollment (Student ID) → Student (Student ID)

Enrollment (Course ID) → Course (Course ID)

Student (Advisor ID) → Professor (Prof ID)

Course (Department Code) → Department (Dept Code)

Department (Chair ID) → Professor (Prof ID)

Task 2.1

1. Strong: Patient, Doctor, Department

Weak: Appointment, Prescription, Hospital Room

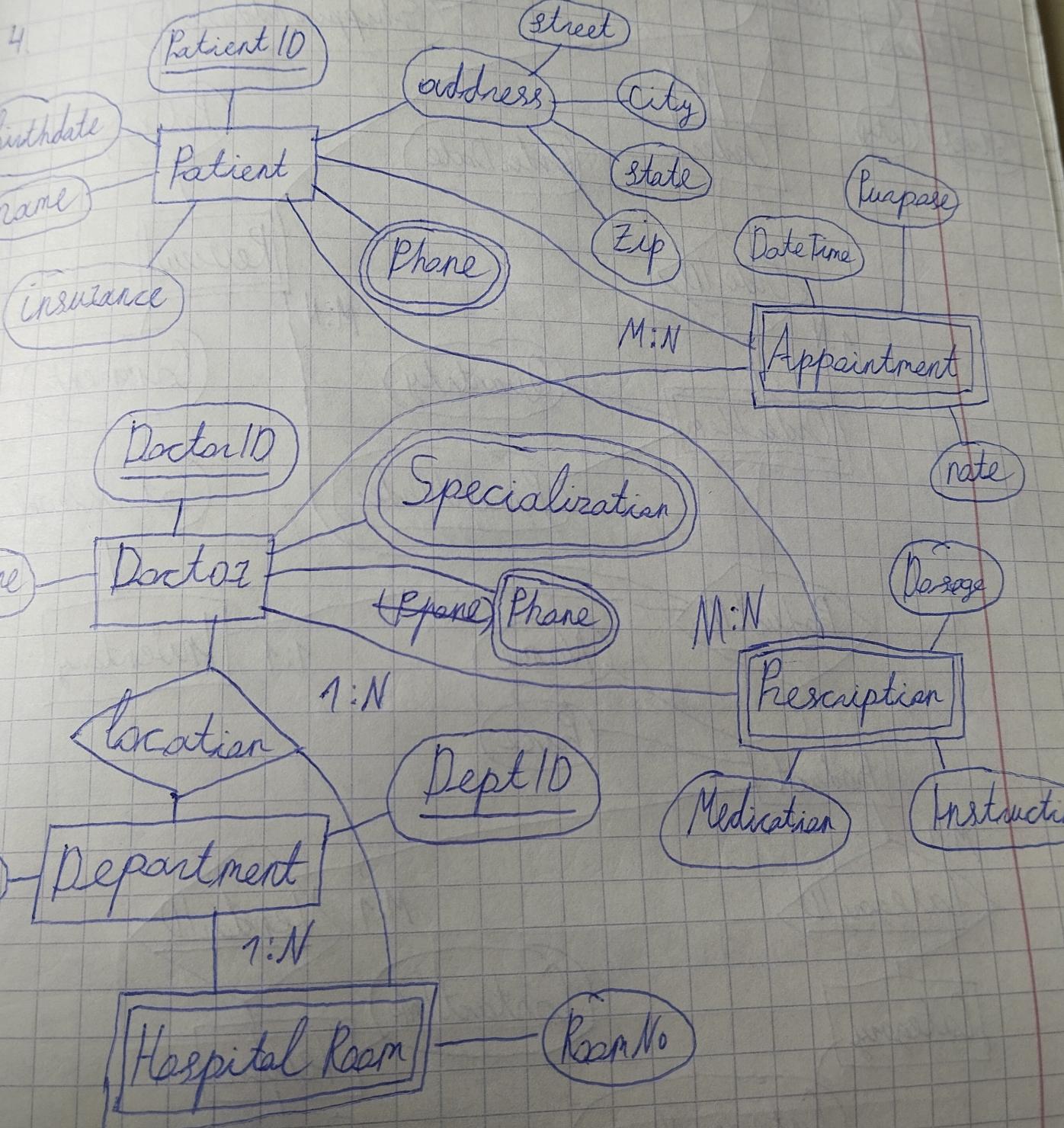
2. Simple: Name, Birthdate, DeptName, Purpose, Notes, Medication, Dosage, Instructions, Room No.

Composite: Address

Multi-valued: Phone (Patient, Doctor), Specialization

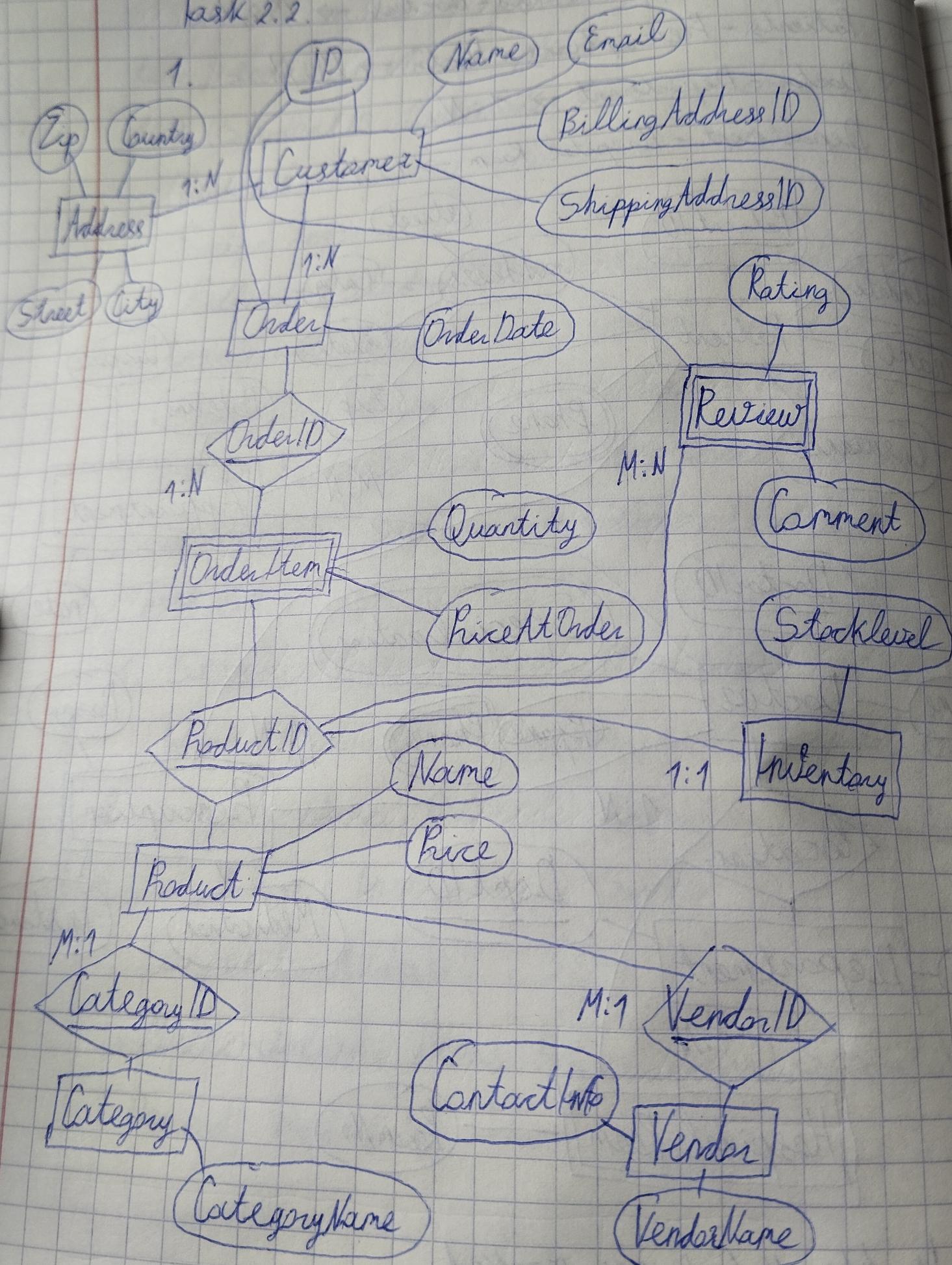
Derived: Birthdate) There is not

- 6 7 8
3. Patient - Appointment - Doctor → M:N
 Patient - Prescription - Doctor → M:N
 Doctor - Department → 1:N
 Department - Hospital Room → 1:N



5. In the 4 task are marked.

Task 2.2.



2. OrderItem - cannot exist without „Order“
 Review - cannot exist without „Customer“
 and „Product“

3. Customer \leftrightarrow Product (through Review)

Order \leftrightarrow Product (through OrderItem)

Attributes: Rating, Comment

Attributes: Quantity, PriceAtOrder

Task 4.1.

1. StudentID \rightarrow StudentName, StudentMajor

ProjectID \rightarrow ProjectTitle, ProjectType.

SupervisionID \rightarrow SupervisorName, SupervisorDept

(StudentID, ProjectID) \rightarrow Role, HoursWorked, StartDate, EndDate)

2. Redundancy: StudentName and StudentMajor
 repeated for one student if he participates in several
 projects

Update: If a student has changed his major,
 you need to change StudentMajor in all lines
 where this student appears.

Insert: You can't get a new Supervisor

until you have a project with a student.

Delete: If we remove the last student from a project, we lose information about the project itself.

3. The table is already in 1NF

4. No partial dependencies

Separate tables:

Student (StudentID, StudentName, StudentMajor)

Project (ProjectID, ProjectTitle, ProjectType, SupervisorID)

Supervisor (SupervisorID, SupervisorName, SupervisorDept)

StudentProject (StudentID, ProjectID, Role, HoursWorked, StartDate, EndDate)

5. No transitive dependencies

The table is already in 3NF:

Student:

StudentID	StudentName	StudentMajor
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Project:

ProjectID	ProjectTitle	ProjectType	SupervisorID
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Supervision:

SupervisionID	SupervisionName	SupervisionDept
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Student Project:

StudentID	ProjectID	Role	Homeworked	Start Date	End Date
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Task 4.2.

1. Primary (Key) Key: (StudentID, CourseID, TimeSlot).

2. StudentID → Student Major

CourseID → Course Name

InstructorID → Instructor Name

Room → Building

(CourseID, TimeSlot) → InstructorID, Room

(StudentID)

(StudentID, CourseID, Tim Slot) → everything else.

3. StudentID → Student Major (StudentID is not superkey)

CourseID → Course Name (CourseID is not superkey)

Room → Building (Room is not superkey)

InstructorID → Instructor Name (InstructorID is not superkey)

superkey)

Table isn't BCNF

9. Tables:

Student (StudentID, StudentMajor)

Course (CourseID, CourseName)

Instructor (InstructorID, InstructorName)

Room (Room, Building)

CourseSection (CourseID, TimeSlot, InstructorID, Room)

Enrollment (StudentID, CourseID, TimeSlot)

Then tables are BCNF

5. There is no loss of information, because all dependencies are in separate tables