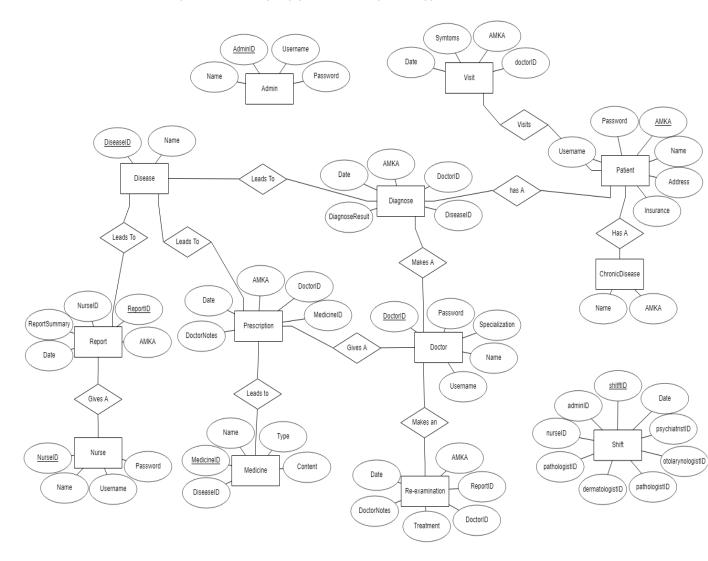
# CS-360 Files And Databases Project

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### E-R Diagram - Διάγραμμα Οντοτήτων Σχέσεων



### Entities and Attributes - Οντότητες και γνωρίσματα οντοτήτων

### **Doctor**

- 1. Name VARCHAR(30)
- 2. Specialization ENUM('Dermatologist','Pathologist','Psychiatrist', 'Otolaryngologist','Ophthalmologist') NOT NULL
- 3. Username VARCHAR(30)
- 4. Password VARCHAR(30)
- 5. DoctorID INT UNSIGNED NOT NULL AUTO\_INCREMENT PRIMARY KEY

### Nurse

- 1. Name VARCHAR(30)
- 2. Username VARCHAR(30)
- 3. Password VARCHAR(30)
- 4. NurselD INT UNSIGNED NOT NULL AUTO INCREMENT PRIMARY KEY

### Admin

- 1. Name VARCHAR(30)
- 2. Username VARCHAR(30)
- 3. Password VARCHAR(30)
- 4. AdminID INT UNSIGNED NOT NULL AUTO\_INCREMENT PRIMARY KEY

### **Patient**

- 1. Name VARCHAR(30)
- 2. Username VARCHAR(30)
- 3. Password VARCHAR(30)
- 4. Address VARCHAR(30)
- 5. Insurance VARCHAR(30)
- 6. AMKA CHAR(11) NOT NULL PRIMARY KEY

### Visit

- 1. Date DATE
- 2. Symptoms VARCHAR(30)
- 3. AMKA CHAR(11)
- 4. DoctorID INT UNSIGNED

FOREIGN KEY (AMKA) REFERENCES Patients(AMKA) FOREIGN KEY (DoctorID) REFERENCES Doctors(DoctorID)

### **ChronicDisease**

- 1. Name VARCHAR(30)
- 2. AMKA CHAR(11)

FOREIGN KEY (AMKA) REFERENCES Patients(AMKA)

### **Disease**

- 1. Name VARCHAR(30)
- DiseaseID INT UNSIGNED NOT NULL AUTO\_INCREMENT PRIMARY KEY

### Medicine

- 1. Name VARCHAR(30)
- 2. Type VARCHAR(30)
- 3. Content INT UNSIGNED
- 4. DiseaseID INT UNSIGNED
- MedicineID INT UNSIGNED NOT NULL AUTO\_INCREMENT PRIMARY KEY

FOREIGN KEY (DiseaseID) REFERENCES Diseases(DiseaseID)

### Diagnose

- 1. DiagnoseResult VARCHAR(30)
- 2. Date DATE
- 3. AMKA CHAR(11)
- 4. DoctorID INT UNSIGNED
- 5. DiseaseID INT UNSIGNED

FOREIGN KEY (AMKA) REFERENCES Patients(AMKA)

FOREIGN KEY (DoctorID) REFERENCES Doctors(DoctorID)

FOREIGN KEY (DiseaseID) REFERENCES Diseases(DiseaseID)

### Re-Examination

- 1. DoctorNotes VARCHAR(30)
- 2. Treatment VARCHAR(30)
- 3. Date DATE
- 4. AMKA CHAR(11)
- 5. DoctorID INT UNSIGNED
- 6. ReportID INT UNSIGNED

FOREIGN KEY (AMKA) REFERENCES Patients(AMKA)

FOREIGN KEY (DoctorID) REFERENCES Doctors(DoctorID)

FOREIGN KEY (ReportID) REFERENCES Reports(ReportID)

### **Prescriptions**

- 1. DoctorNotes VARCHAR(30)
- 2. Date DATE
- 3. AMKA CHAR(11)
- 4. DoctorID INT UNSIGNED
- 5. MedicineID INT UNSIGNED

FOREIGN KEY (AMKA) REFERENCES Patients(AMKA)

FOREIGN KEY (DoctorID) REFERENCES Doctors(DoctorID),"

FOREIGN KEY (MedicineID) REFERENCES Medicines(MedicineID));";

### Shift

- 1. Date DATE
- 2. DermatologistID INT UNSIGNED
- 3. PathologistID INT UNSIGNED
- 4. PsychiatristID INT UNSIGNED
- 5. OtolaryngologistID INT UNSIGNED
- 6. OphthalmologistID INT UNSIGNED
- 7. NurseID INT UNSIGNED
- 8. AdminID INT UNSIGNED

9. ShiftID INT UNSIGNED NOT NULL AUTO\_INCREMENT PRIMARY KEY FOREIGN KEY (DermatologistID) REFERENCES Doctors(DoctorID) FOREIGN KEY (PathologistID) REFERENCES Doctors(DoctorID) FOREIGN KEY (PsychiatristID) REFERENCES Doctors(DoctorID) FOREIGN KEY (OtolaryngologistID) REFERENCES Doctors(DoctorID) FOREIGN KEY (OphthalmologistID) REFERENCES Doctors(DoctorID) FOREIGN KEY (NurseID) REFERENCES Nurses(NurseID) FOREIGN KEY (AdminID) REFERENCES Admins(AdminID)

### Report

- 1. ReportSummary VARCHAR(30)
- 2. Date DATE
- 3. AMKA CHAR(11)
- NurselD INT UNSIGNED
   FOREIGN KEY (AMKA) REFERENCES Patients(AMKA)
   FOREIGN KEY (NurselD) REFERENCES Nurses(NurselD)

### Primary Keys - Πρωτεύοντα κλειδιά

Doctors Primary Key	$\rightarrow$	DoctorID	(Ιατρος)
Nurses Primary Key	$\rightarrow$	NursesID	(Νοσηλευτης)
Admins Primary Key	$\rightarrow$	AdminID	(Διοικητικο προσωπικο)
Patients Primary Key	$\rightarrow$	PatientID	(Ασθενης)
Diseases Primary Key	$\rightarrow$	DiseaseID	(Ασθενειες)
Medicines Primary Key	$\rightarrow$	MedicineID	(Φαρμακα)
Reports Primary Key	$\rightarrow$ F	ReportID	(Αναφορες των νοσηλευτων)
Shifts Primary Key	$\rightarrow$	ShiftID	(Βάρδιες)

### Relational Model - Σχεσιακο Μοντέλο

Doctors
DoctorID   Name   Specialization   Username   Password
Nurses
NurseID   Name   Username   Password
Admins
AdminID   Name   Username   Password
1

Patients
AMKA   Name   Username   Password   Address   Insurance
Visits   DoctorID   Date   Symptoms   AMKA
Chronic Diseases
Name   AMKA
<u> </u>
Diseases
<u>DiseaseID</u>   Name
<u>Biseaseris                                     </u>
Medicines
MedicineID   Name   Type   Content   DiseaseID
Diagnoses
DiagnoseResult   Date   AMKA   DoctorID   DiseaseID
<u> </u>
Evenination
Examination
DoctorNotes   Treatment   Date  AMKA   DoctorID   ReportID
Prescriptions
DoctorNotes   Date   AMKA   DoctorID   MedicineID
Shifts
ShiftID   Date   DermatologistID   PathologistID   PsychiatristID
NurseID   AdminID   OphthalmologistID   OtolaryngologistID
<u> </u>
Poport
Report   ReportSummary   Date   AMKA   NurseID
·

### Τρίτη Κανονική Μορφή - 3NF

Γνωρίζουμε ότι αν σε μια σχέση R τηρούνται οι παρακάτω προϋποθέσεις τοτε βρισκεται σε μορφη 3NF (Third Normal Form):

- (a) Αν είναι First Normal Form (Ειναι 1NF αν δεν έχει σύνθετα και πλειότιμα γνωρίσματα)
- (b) Αν είναι σε 2NF (κάθε συναρτησιακή εξάρτηση X -> Y που υπάρχει στην R είναι πλήρως λειτουργική εξάρτηση). Γνωριζουμε οτι αν η συναρτησιακή εξάρτηση παύει να ισχύει οταν αφαιρουμε οποιοδήποτε πεδίο από το X, τοτε η συναρτησιακή εξάρτηση X -> Y είναι πλήρως λειτουργική εξάρτηση (full functional dependency).
- (c) Αν δεν υπάρχουν μεταβατικές εξαρτήσεις (transitive dependencies). Μία συναρτησιακή εξάρτηση

X -> Y εχει μεταβατικες εξαρτησεις αν ισχύει ότι X -> Z και Z -> Y για ένα σύνολο από πεδία που δεν ανήκουν σε κανένα key.

Οπότε συμπεραίνουμε ότι η βάση είναι σε μορφή 3NF (Third Normal Form-3η Κανονικη Μορφη)

### SQL Commands - Εντολές SQL

### **Create Table commands**

**Doctors** = "CREATE TABLE Doctors("

- + "Name VARCHAR(30),"
  - + "Specialization

ENUM('Dermatologist', 'Pathologist', 'Psychiatrist', 'Otolaryngologist', 'Ophthalmologist') NOT NULL,"

- + "Username VARCHAR(30),"
- + "Password VARCHAR(30),"
- + "DoctorID INT UNSIGNED NOT NULL AUTO\_INCREMENT PRIMARY

KEY);";

### Nurses = "CREATE TABLE Nurses("

- + "Name VARCHAR(30),"
- + "Username VARCHAR(30),"
- + "Password VARCHAR(30),"
- + "NurseID INT UNSIGNED NOT NULL AUTO INCREMENT

### PRIMARY KEY);";

### Admins = "CREATE TABLE Admins("

- + "Name VARCHAR(30),"
- + "Username VARCHAR(30),"
- + "Password VARCHAR(30),"

### Patients = "CREATE TABLE Patients("

- + "Name VARCHAR(30),"
- + "Username VARCHAR(30),"
- + "Password VARCHAR(30),"
- + "Address VARCHAR(30),"
- + "Insurance VARCHAR(30),"
- + "AMKA CHAR(11) NOT NULL PRIMARY KEY);";

### Visits = "CREATE TABLE Visits("

- + "Date DATE,"
- + "Symptoms VARCHAR(30),"
- + "AMKA CHAR(11),"
- + "DoctorID INT UNSIGNED,"
- + "FOREIGN KEY (AMKA) REFERENCES Patients(AMKA),"
- + "FOREIGN KEY (DoctorID) REFERENCES Doctors(DoctorID));";

### ChronicDiseases = "CREATE TABLE ChronicDiseases("

- + "Name VARCHAR(30),"
- + "AMKA CHAR(11),"
- + "FOREIGN KEY (AMKA) REFERENCES Patients(AMKA));";

### Diseases = "CREATE TABLE Diseases("

- + "Name VARCHAR(30),"
- + "DiseaseID INT UNSIGNED NOT NULL AUTO INCREMENT

### PRIMARY KEY);";

### Medicines = "CREATE TABLE Medicines("

- + "Name VARCHAR(30),"
- + "Type VARCHAR(30),"
- + "Content INT UNSIGNED,"
- + "DiseaseID INT UNSIGNED,"
- + "MedicineID INT UNSIGNED NOT NULL AUTO INCREMENT
- + "FOREIGN KEY (DiseaseID) REFERENCES

### Diseases(DiseaseID));";

### **Diagnoses** = "CREATE TABLE Diagnoses("

- + "DiagnoseResult VARCHAR(30),"
- + "Date DATE,"
- + "AMKA CHAR(11),"
- + "DoctorID INT UNSIGNED,"
- + "DiseaseID INT UNSIGNED."
- + "FOREIGN KEY (AMKA) REFERENCES Patients(AMKA),"
- + "FOREIGN KEY (DoctorID) REFERENCES Doctors(DoctorID),"

### + "FOREIGN KEY (DiseaseID) REFERENCES

### Diseases(DiseaseID));";

### **Examination = "CREATE TABLE Examinations("**

- + "DoctorNotes VARCHAR(30),"
- + "Treatment VARCHAR(30),"
- + "Date DATE,"
- + "AMKA CHAR(11),"
- + "DoctorID INT UNSIGNED,"
- + "ReportID INT UNSIGNED,"
- + "FOREIGN KEY (AMKA) REFERENCES Patients(AMKA),"
- + "FOREIGN KEY (DoctorID) REFERENCES Doctors(DoctorID),"
- + "FOREIGN KEY (ReportID) REFERENCES Reports(ReportID));";

### Prescriptions = "CREATE TABLE Prescriptions("

- + "DoctorNotes VARCHAR(30),"
- + "Date DATE,"
- + "AMKA CHAR(11),"
- + "DoctorID INT UNSIGNED,"
- + "MedicineID INT UNSIGNED,"
- + "FOREIGN KEY (AMKA) REFERENCES Patients(AMKA),"
- + "FOREIGN KEY (DoctorID) REFERENCES Doctors(DoctorID),"
- + "FOREIGN KEY (MedicineID) REFERENCES

### Medicines(MedicineID));";

### **Shifts** = "CREATE TABLE Shifts("

- + "Date DATE,"
- + "DermatologistID INT UNSIGNED,"
- + "PathologistID INT UNSIGNED,"
- + "PsychiatristID INT UNSIGNED,"
- + "OtolaryngologistID INT UNSIGNED,"
- + "OphthalmologistID INT UNSIGNED,"
- + "NurseID INT UNSIGNED,"
- + "AdminID INT UNSIGNED,"
- + "FOREIGN KEY (DermatologistID) REFERENCES Doctors(DoctorID),"
- + "FOREIGN KEY (PathologistID) REFERENCES Doctors(DoctorID),"
- + "FOREIGN KEY (PsychiatristID) REFERENCES Doctors(DoctorID),"
- + "FOREIGN KEY (OtolaryngologistID) REFERENCES Doctors(DoctorID),"
- + "FOREIGN KEY (OphthalmologistID) REFERENCES Doctors(DoctorID),"
- + "FOREIGN KEY (NurseID) REFERENCES Nurses(NurseID),"
- + "FOREIGN KEY (AdminID) REFERENCES Admins(AdminID),"
- + "ShiftID INT UNSIGNED NOT NULL AUTO\_INCREMENT PRIMARY

### KEY);";

Report = "CREATE TABLE Reports("

- + "ReportSummaryVARCHAR(30),"
- + "Date DATE,"
- + "AMKA CHAR(11),"
- + "NurseID INT UNSIGNED,"
- + "FOREIGN KEY (AMKA) REFERENCES Patients(AMKA),"
- + "FOREIGN KEY (NurseID) REFERENCES Nurses(NurseID));";

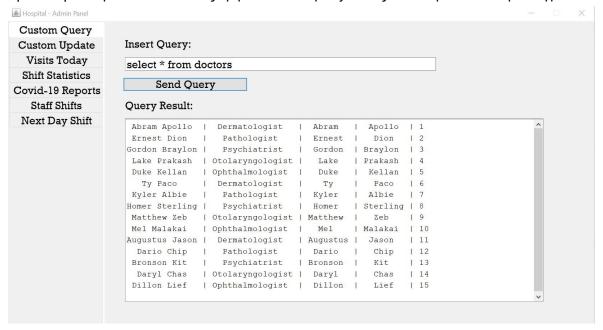
Οι εισαγωγες για τα Nurse γινονται με την εξης εντολη: INSERT INTO Nurses VALUE("+name+", "+username+", "+password+", NULL) Ομοιως και για τα υπολοιπα. Οι εισαγωγες γινονται αυτοματα στην αρχη του προγραμματος.

Questions to the Database - Ερωτήσεις προς την Βάση Δεδομένων με SQL Screenshots από την εκτέλεση κάθε προκαθορισμένης επερώτησης

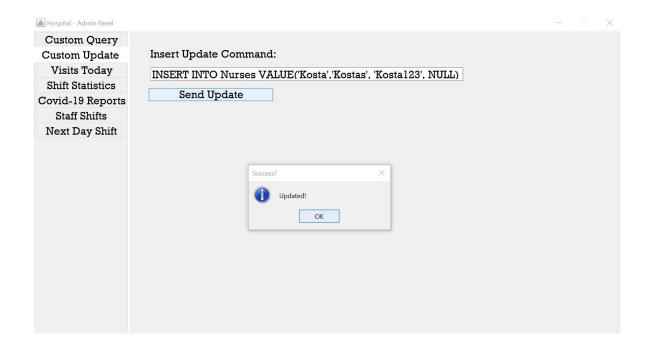
Οι προκαθορισμένες ερωτήσεις γίνονται με το πάτημα ενός κουμπιού στο Admin Interface. Για τυπικούς λόγους περιέχονται και οι ερωτήσεις που έγιναν όταν ο χρήστης πατάει κάποιο κουμπί.

### **Custom query**

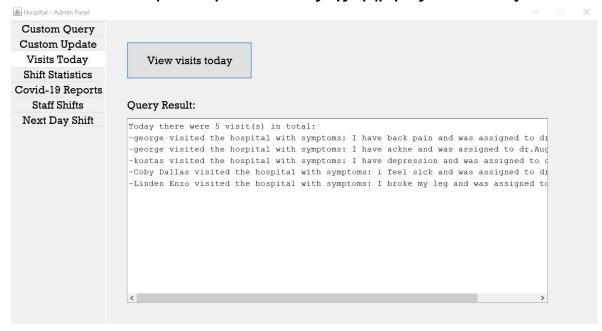
Στο Custom Query μπορείτε να πληκτρολογήσετε οποιαδήποτε εντολή επιθυμείτε προς την Βάση Δεδομένων και να σας εμφανιστεί το query όπως στο παρακάτω παράδειγμα:



Custom Update - Οι Admins μπορουν να κανουν insert ή update οτιδήποτε θελήσουν (Doctors, Nurses και αλλους Admins κλπ)



### Κατάσταση επισκέψεων στο τέλος της εφημερίας - Visits Today

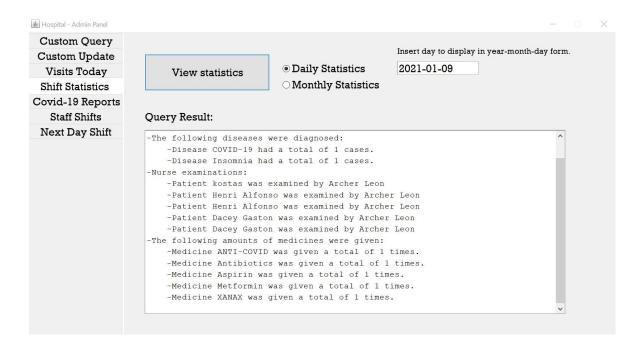


### Για αυτο το query εγινε η εξης ερωτηση προς την Βάση Δεδομένων:

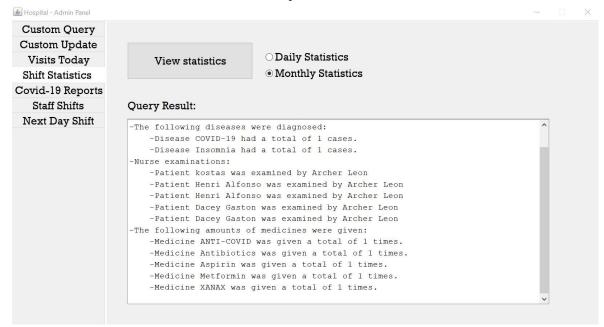
SELECT AMKA, Symptoms, DoctorID from Visits Where Date=DATE(NOW())

Στατιστικά ανά εφημερία και ανά μήνα: για κάθε εφημερία και για όλες τις εφημερίες του μήνα στατιστικά στοιχεία για τον αριθμό των περιστατικών, τις ασθένειες που διαγνώστηκαν, τις εξετάσεις που έγιναν και τα φάρμακα που δόθηκαν. Shift Statistics

### **Daily Statistics**



### **Monthly Statistics**



Για αυτα τα queries εγιναν οι εξης ερωτησεις προς την Βάση Δεδομένων:

### **ShiftStatsDaily**

SELECT Date from Visits Where Date="dateStr"

SELECT DiseaseID from Diagnoses Where Date="dateStr"

SELECT NurseID, AMKA from Reports Where Date="dateStr"

SELECT MedicineID from Prescriptions Where Date="dateStr"

### **ShiftStatsMonthly**

String dateCmp = "Date(NOW() - INTERVAL 1 MONTH) <= Date AND Date <= DATE(NOW())";

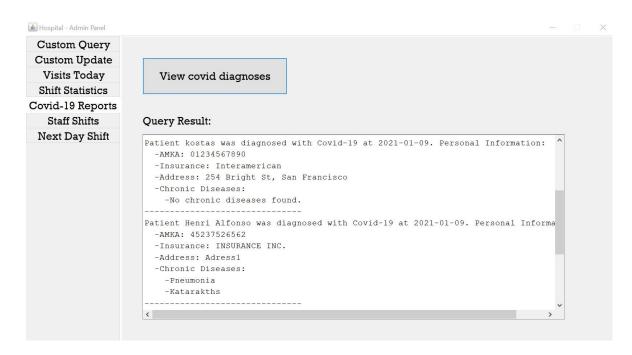
SELECT Date from Visits Where " + dateCmp

SELECT DiseaseID from Diagnoses Where " + dateCmp

SELECT NurseID, AMKA from Reports Where " + dateCmp

SELECT MedicineID from Prescriptions Where " + dateCmp

Ειδική κατάσταση αναφοράς περιστατικών COVID-19 η οποία περιλαμβάνει όλα τα προσωπικά στοιχεία του ασθενούς και τα χρόνια νοσήματα από τα οποία πάσχει - COVID-19 report.



Για αυτο το query εγιναν οι εξης ερωτησεις προς την Βάση Δεδομένων:

SELECT Date, AMKA from Diagnoses Where DiseaseID=" + covidID SELECT Name, Insurance, Address from Patients Where AMKA=" + amka

# Για κάθε μέλος του προσωπικού, μπορουμε να δουμε τις εφημερίες κατά τις οποίες εργάστηκε σε ένα χρονικό διάστημα.



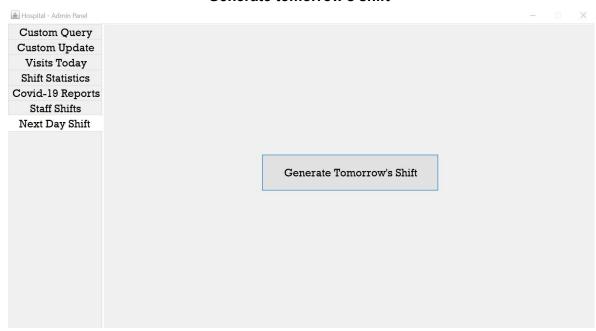
### Για αυτο το query εγιναν οι εξης ερωτησεις προς την Βάση Δεδομένων:

start = "STR\_TO\_DATE("+start+"', '%Y-%m-%d')"; end = "STR\_TO\_DATE("+end+"', '%Y-%m-%d')"; String dateInterval = start+"<= Date AND Date <="+end; SELECT \* from Shifts Where" + dateInterval SELECT Name, DoctorID from Doctors SELECT Name, NurseID from Nurses

OFLECT Name, Nuiselb nom Nuises

SELECT Name, AdminID from Admins

### Generate tomorrow's shift

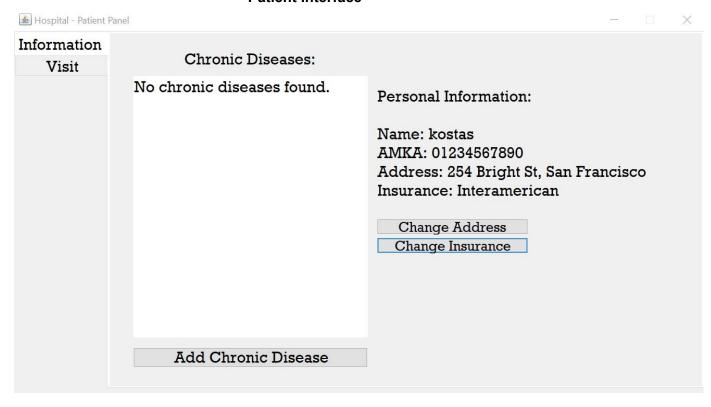


## Graphical Interface - Γραφικό Περιβάλλον

### Login Panel

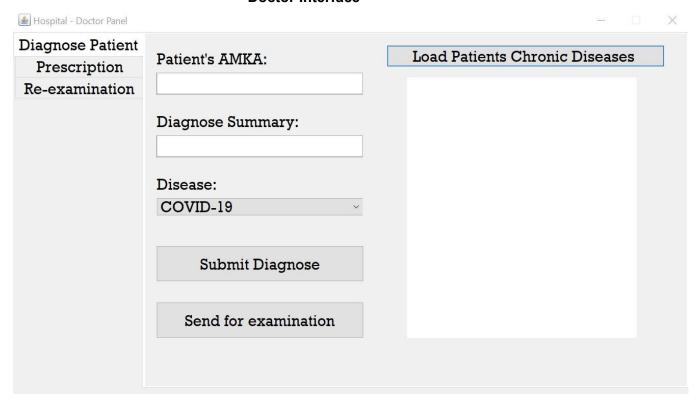
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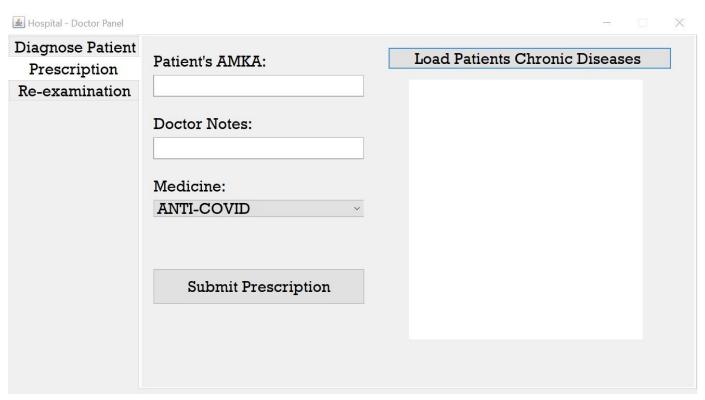
### **Patient Interface**



🛓 Hospital - Patient I	Panel		<u> </u>	$\times$
Information Visit				
	Describe your symptoms:			
	Choose doctor specialization	<ul> <li>Dermatologist</li> <li>Pathologist</li> <li>Psychiatrist</li> <li>Otolaryngologist</li> <li>Ophthalmologist</li> </ul>		
		Find doctor on duty.		

### **Doctor Interface**





		_	×
Diagnose Patient Prescription	Report ID:		
Re-examination		Load Report.	
	Patient AMKA:	Nurse report summary:	
	Insert report id to load.	Insert report id to load.	
	Notes:		
	Treatment (if required):		
	Submit Examination		
⊌ Hospital - Nu	Nurse Interface urse Panel	- D X	
Patie	ent's AMKA:		

# Patient's AMKA: Report Summary: Submit Report