**Step 1 - Identify entities**

Entity Set

|  |  |
| --- | --- |
| No | Entity set |
| 1 | DOCTOR |
| 2 | PATIENT |
| 3 | APPOINTMENT |

**Step 2 - Remove duplicate entities**

Entity Set

|  |  |  |
| --- | --- | --- |
| No | Entity set | Type |
| 1 | DOCTOR | Strong |
| 2 | PATIENT | Strong |
| 3 | APPOINTMENT | Strong |

**Step 3 - List the attributes of each entity set**

We had Domain to constraint the value type and Optional to constraint it can be null or not

Doctor Entity Set

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute name | Type | Domain | Optional |
| DOCTOR\_ID | Unique identifier | Numeric | NO |
| NAME | Composite attribute | Text | NO |
| PHONE | Multi-valued attribute | Numeric | YES |
| SPECIALTY NUMBER | Multi-valued attribute | Numeric | NO |
| SPECIALTY | Composite attribute | Text | NO |

Patient Entity Set

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute name | Type | Domain | Optional |
| Patient\_ID | Unique identifier | Numeric | No |
| NAME | Composite attribute | Text | No |
| PHONE | Multi-valued attribute | Numeric | YES |
| E-MAIL | Single valued attribute | Text | YES |
| ADDRESS | Composite attribute | Text | YES |
| DATE | Derived attribute | Numeric | NO |
| ALLERGIES | Composite attribute | Text | YES |
| DOCTOR\_IDENTIFIER | Unique identifier | Numeric | YES |

Appointment Entity Set

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute name | Type | Domain | Optional |
| APPOINTMENT\_ID | Unique identifier | Numeric | NO |
| DATE | Derived attribute | Numeric | NO |
| DOCTOR\_ID | Unique identifier | Numeric | NO |
| PATIENT\_ID | Unique identifier | Numeric | NO |
| BLOOD PRESSURE | Single valued attribute | Numeric | YES |
| PULSE | Single valued attribute | Numeric | YES |
| NOTES | Composite attribute | Text | YES |
| MEDICINES | Composite attribute | Text | YES |

**Step 4 - Choose a unique identifier**

We choose ID for Doctor, Patient and Appointment as unique identifier.

**Step 5 - Define the relationship sets**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Relationship Set | Identifying | Left verb | Right verb | Cardinality | optionality |
| 1 | DOCTOR->PATIENT | NO | Treat | be treated | Many-to-many | May |
| 2 | APPOINTMENT-PATIENT | NO | Make | Be made | Many-to-many | May |
| 3 | APPOINTMENT-PATIENT | NO | Make | Be made | Many-to-many | May |

**Reference**

Sharma, N., Perniu, L., Chong, R. F., Iyer, A., Nandan, C., Mitea, A. C., Nonvinkere, M. & Danubianu, M. (2010). *Database fundamentals*. IBM Canada.