✅1. Immigrants

- **Attributes:** Passport_No, Fname, Lname, Country, City, Gender, DOB
- **Primary Key:** Passport_No
- **Foreign Key(s):** None
- **Functional Dependencies:**
  Passport_No → Fname, Lname, Country, City, Gender, DOB
- **BCNF:** ✅Yes
- **Reasoning:** All functional dependencies have a super key on the left-hand side (Passport_No), so this table is in BCNF.

✅2. Immigrant_Phone_Info

- **Attributes:** Passport_No, Phone_No
- **Primary Key:** (Passport_No, Phone_No)
- **Foreign Key(s):** Passport_No → Immigrants(Passport_No)
- **Functional Dependencies:**
  (Passport_No, Phone_No) → all
- **BCNF:** ✅Yes
- **Reasoning:** All FDs stem from the full composite primary key — no partial or transitive dependencies.

✅3. Immigrant_Email_Info

- **Attributes:** Passport_No, Email_ID
- **Primary Key:** (Passport_No, Email_ID)
- **Foreign Key(s):** Passport_No → Immigrants(Passport_No)
- **Functional Dependencies:**
  (Passport_No, Email_ID) → all
- **BCNF:** ✅Yes
- **Reasoning:** Same as above — all FDs are from the composite primary key.

✅4. Sponsors_Employer

- **Attributes:** Employer_Passport_No, Start_Date, End_Date, Relationship_Type, Sponsorship_Status
- **Primary Key:** Employer_Passport_No
- **Foreign Key(s):** Employer_Passport_No → Immigrants(Passport_No)
- **Functional Dependencies:**
  Employer_Passport_No → Start_Date, End_Date, Relationship_Type, Sponsorship_Status
- **BCNF:** ✅Yes
- **Reasoning:** Single FD from the primary key; no violation of BCNF.

❌5. Sponsors_Employee

- **Attributes:**
  Employee_Passport_No, Start_Date, End_Date, Relationship_Type, Sponsorship_Status, Employer_Passport_No
- **Keys:**
- **PK:** Employee_Passport_No
- **FK:** Employer_Passport_No
- **BCNF:** ✕No
- **Reason:**
  The table cannot be converted to BCNF in its current form because the essential business relationship requires that employer passport numbers determine sponsorship details while maintaining a one-to-many relationship between employers and employees, creating an unavoidable functional dependency that violates BCNF rules without decomposition. This fundamental data relationship prevents BCNF compliance while preserving the required data semantics and cardinality constraints.
- **Assumption:** Only current sponsorships stored (no history)

✕6. Family_Sponsor_Sponoree

- **Attributes:**
  Dependents_Passport_Number, Sponsorer_Member_Passport_No, Relationship_Type, Emergency_Contact, Date_of_Relationship_Establishment, Financial_Dependency_Status
- **PK:** Dependents_Passport_Number
- **FK:** Sponsorer_Member_Passport_No (references Immigrants.Passport_No)
- **BCNF Status:** ✕No
- **Reason:**
  Potential FD Sponsorer_Member_Passport_No → Relationship_Type (if sponsors enforce uniform relationship types).
- **Assumption:** No historical data (only current relationships stored).

✓7. Visa

- **Attributes:**
  Visa_ID, Issue_Date, Expiry_Date, Visa_Type, Duration, CID, Passport_No, Visa_Status, Is_Blacklist, E_ID, VisaOfficer_ID

- **PK:** Visa_ID
- **FKs:** Passport_No, CID, E_ID
- **BCNF Status:** ✅Yes
- **Reason:** The only confirmed FD is Visa_ID → all attributes (super key determines all).
- **Unless Passport_No** → Visa_Status is proven true, BCNF holds.
- **Assumption:** One passport can have multiple visas (standard case).

✅8. Asylum_Seeker

- **Attributes:**
  CID, Passport_Number, Application_ID, Place_of_Arrival, Date_of_Departure, Reason_of_Request, Current_Status, Hearing_Date, AsylumOfficer_ID
- PK: (CID, Passport_Number, Application_ID)
- FK: Passport_Number (references Immigrants.Passport_No)
- BCNF Status: ✅Yes
- **Reason:** Full composite PK → all attributes
- **Assumption:** 1 passport : N applications, no Application_ID → Passport_Numbe

✅9. Request

- **Attributes:** ApplicationID, Priority_Level, Submission_Date, Requested_For, Passport_No, CID, DID
- **PK:** ApplicationID
- **FK:** Passport_No → Immigrants.Passport_No, CID → Category.CID, DID → Department.DID
- **BCNF: ✅Yes**

- **Reason:** Super key ApplicationID functionally determines all attributes
- **Assumption:** One-to-one mapping between applications and request

✅10. Govt_Employee

- **Attributes:** E_ID, VisaOfficer_ID, DOB, Gender, Country, City, E_LastName, E_FirstNam e
- **PK:** (E_ID, VisaOfficer_ID)
- **FK:** None
- **BCNF: ✅Yes**
- **Reason:** Full composite PK → all attributes
- **Assumption:** Each employee has only one VisaOfficer_ID

✅11. Govt_Emp_Email_Info

- **Attributes:** E_ID, EmailID
- **PK:** (E_ID, EmailID)
- **FK:** E_ID → Govt_Employee.E_ID
- **BCNF: ✅Yes**
- **Reason:** Full composite PK → all attributes
- **Assumption:** One employee can have multiple emails

✅12. Govt_Emp_Contact_Info

- **Attributes:** E_ID, Contact

- **PK:** (E_ID, Contact)
- **FK:** E_ID → Govt_Employee.E_ID
- **BCNF: ✅Yes**
- **Reason:** Full composite PK → all attributes
- **Assumption:** One employee can have multiple contact numbers

✅13. Immigrant_Category

- **Attributes**: Passport_No, CID
- **PK**: Passport_No
- **FDs**: Passport_No → CID
- **BCNF**: ✅Yes
- **Reason:** Passport_No is a super key determining CID
- **Assumption: One immigrant belongs to exactly one category**

✅14. Category

- **Attributes:** CID, Category_Name, Description, Visa_ID
- **PK:** CID
- **FK: Visa_ID** → Visa.Visa_ID
- **BCNF: ✅Yes**
- **Reason:** CID is a super key determining all attributes
- **Assumption: Each category is linked to exactly one visa type**

✅15. Visa_Officer

- **Attributes:** E_ID, Officer_ID
- **PK:** (E_ID, Officer_ID)
- **FK:** E_ID → Govt_Employee.E_ID
- **BCNF: ✅Yes**
- **Reason:** Full composite PK → all attributes
- **Assumption:** One government employee can hold multiple officer roles

✅16. Department

- **Attributes:** DID, Name, Operating_Hours
- **PK:** DID
- **FK:** None
- **BCNF: ✅Yes**
- **Reason:** DID is a super key with no partial dependencies

✅17. Department_Email_Info

- **Attributes:** DID, D_EmailID
- **PK:** (DID, D_EmailID)
- **FK: DID** → Department.DID
- **BCNF: ✅Yes**
- **Reason:** Full composite PK handles multiple emails per department

✅18. Department_Address_Info

- **Attributes:** DID, D_Address
- **PK:** (DID, D_Address)
- **FK:** DID → Department.DID
- **BCNF: ✅Yes**
- **Reason:** Full composite PK → all attributes
- **Assumption:** One department can have multiple addresses

✅19. Border_Department

- **Attributes:** DID, Border_Type, Checkpoint_Location
- **PK:** DID
- **FK:** DID → Department.DID
- **BCNF: ✅Yes**
- **Reason:** DID is a super key with no partial dependencies
- **Assumption:** Each border department has unique checkpoint locations

✅20. Visa_Department

- **Attributes:** DID, Visa_Processing_Time, Approval_Authority
- **PK:** DID
- **FK:** DID → Department.DID

- **BCNF: ✅Yes**
- **Reason:** DID determines all attributes without redundancy
- **Assumption:** One visa department per administrative region

✅21. Asylum_Department

- **Attributes:** DID, Case_Backlog, Hearing_Rooms
- **PK:** DID
- **FK:** DID → Department.DID
- **BCNF: ✅Yes**
- **Reason:** Full functional dependency on PK
- **Assumption:** Asylum cases are evenly distributed across departments

✅22. Immigration_Officer_Department

- **Attributes:** DID, Officer_Capacity, Training_Level
- **PK:** DID
- **FK:** DID → Department.DID
- **BCNF: ✅Yes**
- **Reason:** No transitive dependencies exist
- **Assumption:** Officer assignments are department-specific