**FDIC SHACL Constraints – Business Explanation**

This SHACL model acts as a **semantic gatekeeper**, validating RDF instances against real-world FDIC and regulatory rules. It ensures that FDIC SOD data is **clean**, **well-structured**, and **fit for integration or compliance reporting**.

Each **NodeShape** below targets the fdic:BankBranch class and enforces a specific rule or quality condition.

**🔹 1. BankBranchTypeCheck**

* **Target Class:** fdic:BankBranch
* **Path:** rdf:type
* **Purpose:**
Validates that each RDF instance of a bank branch explicitly declares its type.
* **Business Relevance:**
Ensures every resource has a valid class definition. This is critical for semantic reasoning, especially when filtering branches by class (e.g., RetailBranch, DigitalBranch).

**🔹 2. MainOfficeFlagCheck**

* **Target Class:** fdic:BankBranch
* **Path:** fdic:mainOfficeFlag
* **Datatype:** xsd:integer
* **Purpose:**
Validates that the field indicating if a branch is the **main office** is present and of the correct data type.
* **Business Relevance:**
This is essential for distinguishing **HQs from branches**, enabling institution-level aggregation and hierarchical navigation.

**🔹 3. StateCodeValidation**

* **Target Class:** fdic:BankBranch
* **Path:** fdic:stateCode
* **Purpose:**
Checks the existence and formatting of the U.S. state code.
* **Business Relevance:**
Validates that branches are assigned valid U.S. state abbreviations (like 'NY', 'CA', etc.), which is crucial for **jurisdictional reporting** and **regional compliance** (e.g., CRA, branch coverage by geography).

**🔹 4. StateNamePresenceCheck**

* **Target Class:** fdic:BankBranch
* **Path:** fdic:stateName
* **Purpose:**
Ensures that the full U.S. state name is present.
* **Business Relevance:**
Enables human-readable reporting and is essential for **UI displays**, **mapping**, and **localization** efforts.

**🔹 5. DateFormatCheck**

* **Target Class:** fdic:BankBranch
* **Path:** fdic:acquisitionDate
* **Datatype:** xsd:date
* **Purpose:**
Validates that the acquisition date is in proper date format.
* **Business Relevance:**
Ensures temporal integrity for acquisition analytics and supports longitudinal analysis—e.g., tracking new branch openings or comparing year-over-year growth.

**🔎 Summary: Why These SHACL Rules Matter**

These constraints:

* **Guard data quality at ingestion time**, catching errors before reasoning or reporting.
* Ensure **compliance with FDIC reporting expectations**, like correct state codes and date formats.
* Help **automate validation** when new CSV versions are uploaded and transformed into RDF.
* Power **AI and search tools** by guaranteeing reliable structure across every RDF instance.

Together with the ontology, these SHACL rules make your semantic model **trustworthy, maintainable, and automation-ready**.