**Database Documentation: Fishy\_v\_02.db**

**1. Overview:**

The database **Fishy\_v\_02.db** is designed to manage information related to aquariums, fish, suppliers, and other related entities.

**2. Tables:**

2.1. **Supplier**:

* **Description**: This table stores information about various suppliers.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| supplier\_id | INTEGER | Unique ID for the supplier | PRIMARY KEY |
| name | TEXT | Supplier's name | NOT NULL |
| contact\_person | TEXT | Contact person at the supplier's location | - |
| phone\_number | TEXT | Supplier's phone number | - |
| alternate\_phone\_number | TEXT | Alternate phone number | - |
| email | TEXT | Supplier's email address | - |
| address | TEXT | Supplier's address | - |
| city | TEXT | Supplier's city | - |
| state\_province | TEXT | State or province | - |
| country | TEXT | Supplier's country | - |
| postal\_code | TEXT | Supplier's postal code | - |
| website | TEXT | Supplier's website | - |
| notes | TEXT | Additional notes | - |

2.2. **Aquarium**:

* **Description**: This table contains details about various aquariums.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| id | INTEGER | Unique ID for the aquarium | PRIMARY KEY |
| name | TEXT | Name of the aquarium | - |
| tank\_type | TEXT | Type of the tank | CHECK IN ('breeding', 'community', 'quarantine', 'species') |
| water\_type | TEXT | Type of water used | CHECK IN ('Freshwater', 'Saltwater', 'Brackish water') |
| shape | TEXT | Shape of the aquarium | CHECK IN ('Cube', 'Rectangular', 'Bow-front', 'Bevelled-front', 'Other') |
| length\_cm | REAL | Length of the aquarium in cm | - |
| width\_cm | REAL | Width of the aquarium in cm | - |
| depth\_cm | REAL | Depth of the aquarium in cm | - |
| capacity\_liters | REAL | Capacity of the aquarium in liters | - |
| substrate | TEXT | Substrate used in the aquarium | CHECK IN ('None', 'Gravel', 'Sand', 'Aqua Soil', 'Pebbles') |
| commissioned\_date | DATE | Date when the aquarium was commissioned | - |
| decommissioned\_date | DATE | Date when the aquarium was decommissioned | - |
| price\_euro | REAL | Price of the aquarium in euros | - |
| vendor\_id | INTEGER | ID of the vendor who sold the aquarium | FOREIGN KEY REFERENCES Supplier(supplier\_id) |
| equipment | TEXT | Equipment used in the aquarium | CHECK IN ('Filters', 'Lights', 'Pumps', 'Heaters', 'Others') |
| co2 | TEXT | Indicates if CO2 is used | CHECK IN ('Yes', 'No') |
| target\_co2\_ppm | REAL | Target CO2 in ppm | - |
| target\_temp\_c | REAL | Target temperature in Celsius | - |
| target\_ph | REAL | Target pH | - |
| target\_kh\_ppm | REAL | Target KH in ppm | - |
| target\_gh\_ppm | REAL | Target GH in ppm | - |
| notes | TEXT | Additional notes | - |

2.3. **Images**:

* **Description**: This table stores images related to various entities.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| image\_id | INTEGER | Unique ID for the image | PRIMARY KEY |
| entity\_type | TEXT | Type of the entity associated with the image | CHECK IN ('Fish', 'Invertebrate', 'Plant', 'Aquarium', 'Equipment') |
| entity\_id | INTEGER | ID of the associated entity | - |
| image | BLOB | Image data | - |

2.4. **TankMates**:

* **Description**: This table details the tank mates for specific fish.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| id | INTEGER | Unique ID for the tank mate entry | PRIMARY KEY |
| fish\_id | INTEGER | ID of the fish | FOREIGN KEY REFERENCES Fish(id) |
| mate\_name | TEXT | Name of the tank mate | - |

2.5. **Fish**:

* **Description**: This table contains details about various fish species.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| id | INTEGER | Unique ID for the fish | PRIMARY KEY |
| size | TEXT | Size category of the fish | - |
| aquarium\_id | INTEGER | ID of the aquarium where the fish resides | FOREIGN KEY REFERENCES Aquarium(id) |
| supplier\_id | INTEGER | ID of the supplier of the fish | FOREIGN KEY REFERENCES Supplier(supplier\_id) |
| scientific\_name | TEXT | Scientific name of the fish | - |
| common\_names | TEXT | Common names of the fish | - |
| care\_level | TEXT | Care level required for the fish | CHECK IN ('Beginner', 'Intermediate', 'Experienced', 'Expert') |
| tank\_region | TEXT | Tank region where the fish resides | CHECK IN ('Bottom', 'Bottom and Middle', 'Middle', 'Middle and Top', 'Top', 'All Ranges') |
| tank\_region\_summary | TEXT | Summary of tank regions | - |
| size\_cm | REAL | Size of the fish in cm | - |
| ph\_min | REAL | Minimum pH for the fish | - |
| ph\_max | REAL | Maximum pH for the fish | - |
| temp\_min | REAL | Minimum temperature for the fish in Celsius | - |
| temp\_max | REAL | Maximum temperature for the fish in Celsius | - |
| gh\_min | REAL | Minimum GH for the fish | - |
| gh\_max | REAL | Maximum GH for the fish | - |
| kh\_min | REAL | Minimum KH for the fish | - |
| kh\_max | REAL | Maximum KH for the fish | - |
| origin\_habitat | TEXT | Origin habitat of the fish | CHECK IN ('African River', 'Asian River', 'Indian River', 'South American River', 'Central American River', 'Central American Lake', 'African Lakes', 'Mangrove Forest', 'Australian River', 'Worldwide') |
| lifespan\_years | REAL | Lifespan of the fish in years | - |
| social\_behavior | TEXT | Social behavior of the fish | CHECK IN ('Peaceful', 'Tolerant', 'Gregarious', 'Aggressive', 'Territorial', 'Fin Nipper', 'Solitary') |
| breeding | TEXT | Breeding details of the fish | - |
| min\_aquarium\_size | REAL | Minimum aquarium size for the fish in liters | - |
| diet\_food | TEXT | Diet type of the fish | CHECK IN ('Carnivore', 'Herbivore', 'Limnivore', 'Omnivore') |
| diet\_summary | TEXT | Diet summary for the fish | - |
| gender\_descriptions | TEXT | Gender descriptions of the fish | - |
| synopsis | TEXT | Synopsis of the fish | - |
| notes | TEXT | Additional notes | - |

2.6. **Equipment**:

* **Description**: This table contains details about equipment used in aquariums.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| id | INTEGER | Unique ID for the equipment | PRIMARY KEY |
| type | TEXT | Type of the equipment | - |
| brand | TEXT | Brand of the equipment | - |
| supplier\_id | INTEGER | ID of the equipment supplier | FOREIGN KEY REFERENCES Supplier(supplier\_id) |
| aquarium\_id | INTEGER | ID of the aquarium where the equipment is used | FOREIGN KEY REFERENCES Aquarium(id) |
| qty\_per\_type | INTEGER | Quantity per type of the equipment | - |
| active | TEXT | Indicates if the equipment is active or not | CHECK IN ("Yes", "No") |
| model | TEXT | Model of the equipment | - |
| purchase\_date | DATE | Purchase date of the equipment | - |
| setup\_date | DATE | Setup date of the equipment | - |
| unit\_price | REAL | Unit price of the equipment in euros | - |
| performance\_lph | REAL | Performance of the equipment in liters per hour | - |
| power\_input | TEXT | Power input required for the equipment | CHECK IN ("220v", "110v") |
| power\_consumption | REAL | Power consumption of the equipment | - |
| run\_time\_hrs\_per\_day | REAL | Run time of the equipment in hours per day | - |
| maintenance\_interval\_days | INTEGER | Maintenance interval in days | - |
| replacement\_interval\_days | INTEGER | Replacement interval in days | - |
| notes | TEXT | Additional notes | - |

2.7. **Invertebrate**:

* **Description**: This table contains details about various invertebrates.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| id | INTEGER | Unique ID for the invertebrate | PRIMARY KEY |
| size | TEXT | Size category of the invertebrate | - |
| aquarium\_id | INTEGER | ID of the aquarium where the invertebrate resides | FOREIGN KEY REFERENCES Aquarium(id) |
| supplier\_id | INTEGER | ID of the invertebrate supplier | FOREIGN KEY REFERENCES Supplier(supplier\_id) |
| common\_names | TEXT | Common names of the invertebrate | - |
| scientific\_name | TEXT | Scientific name of the invertebrate | - |
| care\_level | TEXT | Care level required for the invertebrate | CHECK IN ('Beginner', 'Intermediate', 'Experienced', 'Expert') |
| size\_min\_cm | REAL | Minimum size of the invertebrate in cm | - |
| size\_max\_cm | REAL | Maximum size of the invertebrate in cm | - |
| ph\_min | REAL | Minimum pH for the invertebrate | - |
| ph\_max | REAL | Maximum pH for the invertebrate | - |
| temperature\_min\_c | REAL | Minimum temperature for the invertebrate in Celsius | - |
| temperature\_max\_c | REAL | Maximum temperature for the invertebrate in Celsius | - |
| water\_hardness\_gh\_min | REAL | Minimum GH for the invertebrate | - |
| water\_hardness\_gh\_max | REAL | Maximum GH for the invertebrate | - |
| water\_hardness\_kh\_min | REAL | Minimum KH for the invertebrate | - |
| water\_hardness\_kh\_max | REAL | Maximum KH for the invertebrate | - |
| origin\_habitat | TEXT | Origin habitat of the invertebrate | CHECK IN ('African River', 'Asian River', 'Indian River', 'South American River', 'Central American River', 'Central American Lake', 'African Lakes', 'Mangrove Forest', 'Australian River', 'Worldwide') |
| social\_behavior | TEXT | Social behavior of the invertebrate | CHECK IN ('Peaceful', 'Tolerant', 'Gregarious', 'Aggressive', 'Territorial', 'Fin Nipper', 'Solitary') |
| diet\_food | TEXT | Diet type of the invertebrate | CHECK IN ('Carnivore', 'Herbivore', 'Limnivore', 'Omnivore') |
| diet\_summary | TEXT | Diet summary for the invertebrate | - |
| gender\_descriptions | TEXT | Gender descriptions of the invertebrate | - |
| synopsis | TEXT | Synopsis of the invertebrate | - |
| notes | TEXT | Additional notes | - |

2.8. **Plant**:

* **Description**: This table contains details about various aquatic plants.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| id | INTEGER | Unique ID for the plant | PRIMARY KEY |
| size | TEXT | Size category of the plant | - |
| aquarium\_id | INTEGER | ID of the aquarium where the plant is planted | FOREIGN KEY REFERENCES Aquarium(id) |
| supplier\_id | INTEGER | ID of the plant supplier | FOREIGN KEY REFERENCES Supplier(supplier\_id) |
| region | TEXT | Region of origin for the plant | CHECK IN ('Asia', 'Africa', 'Europe', 'North America', 'South America', 'Australia', 'Cosmopolitan', 'Cultivar') |
| type | TEXT | Type of the plant | CHECK IN ('Bulb/Onion', 'Carpeting', 'Moss', 'Rhizome', 'Rosette', 'Stem', 'Stolon') |
| placement | TEXT | Placement of the plant in the tank | CHECK IN ('Foreground', 'Midground', 'Background') |
| growth\_rate | TEXT | Growth rate of the plant | CHECK IN ('Slow', 'Medium', 'Fast') |
| light\_requirement | TEXT | Light requirement for the plant | CHECK IN ('Low', 'Medium', 'High') |
| co2\_requirement | TEXT | CO2 requirement for the plant | CHECK IN ('Low', 'Medium', 'High') |
| ph\_min | REAL | Minimum pH for the plant | - |
| ph\_max | REAL | Maximum pH for the plant | - |
| temperature\_min\_c | REAL | Minimum temperature for the plant in Celsius | - |
| temperature\_max\_c | REAL | Maximum temperature for the plant in Celsius | - |
| water\_hardness\_gh\_min | REAL | Minimum GH for the plant | - |
| water\_hardness\_gh\_max | REAL | Maximum GH for the plant | - |
| water\_hardness\_kh\_min | REAL | Minimum KH for the plant | - |
| water\_hardness\_kh\_max | REAL | Maximum KH for the plant | - |
| notes | TEXT | Additional notes | - |

2.9. **WaterParameter**:

* **Description**: This table contains water parameter details for various aquariums.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| id | INTEGER | Unique ID for the water parameter entry | PRIMARY KEY |
| aquarium\_id | INTEGER | ID of the associated aquarium | FOREIGN KEY REFERENCES Aquarium(id) |
| date | DATE | Date of the water parameter entry | - |
| ph | REAL | pH value | - |
| kh | REAL | KH value | - |
| gh | REAL | GH value | - |
| ammonia\_ppm | REAL | Ammonia level in ppm | - |
| nitrite\_ppm | REAL | Nitrite level in ppm | - |
| nitrate\_ppm | REAL | Nitrate level in ppm | - |
| phosphate\_ppm | REAL | Phosphate level in ppm | - |
| calcium\_ppm | REAL | Calcium level in ppm | - |
| magnesium\_ppm | REAL | Magnesium level in ppm | - |
| potassium\_ppm | REAL | Potassium level in ppm | - |
| iron\_ppm | REAL | Iron level in ppm | - |
| tds\_ppm | REAL | Total Dissolved Solids in ppm | - |
| temperature\_c | REAL | Temperature in Celsius | - |
| notes | TEXT | Additional notes | - |

2.10. **SupplierProducts**:

* **Description**: This table contains details about various products offered by suppliers.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| id | INTEGER | Unique ID for the product entry | PRIMARY KEY |
| supplier\_id | INTEGER | ID of the supplier offering the product | FOREIGN KEY REFERENCES Supplier(supplier\_id) |
| product\_name | TEXT | Name of the product | - |
| product\_type | TEXT | Type of the product | - |
| product\_description | TEXT | Description of the product | - |
| price | REAL | Price of the product in euros | - |

2.11. **MaintenanceTask**:

* **Description**: This table contains details about various maintenance tasks for aquariums.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| task\_id | INTEGER | Unique ID for the maintenance task | PRIMARY KEY |
| aquarium\_id | INTEGER | ID of the associated aquarium | FOREIGN KEY REFERENCES Aquarium(id) |
| task\_name | TEXT | Name of the maintenance task | CHECK IN ('Water Change', 'Vacumn gravel', 'Filter media change', 'Air stone change', 'Clean heater body', 'Clean filter body & impeller', 'Clean decorations') |
| task\_description | TEXT | Description of the maintenance task | - |
| task\_frequency\_value | INTEGER | Frequency value of the task | - |
| task\_frequency\_unit | TEXT | Frequency unit of the task | CHECK IN ('days', 'weeks', 'months') |
| last\_performed | DATE | Date when the task was last performed | - |
| next\_scheduled | DATE | Date when the task is next scheduled | - |

2.12. **TaskList**:

* **Description**: This table contains a list of unique tasks.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| task\_id | INTEGER | Unique ID for the task | PRIMARY KEY |
| task\_name | TEXT | Name of the task | NOT NULL, UNIQUE |

2.13. **Versioning**:

* **Description**: This table contains versioning details for the database.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| version\_id | INTEGER | Unique ID for the version entry | PRIMARY KEY |
| version\_name | TEXT | Name of the version | NOT NULL |
| version\_date | DATE | Date of the version | DEFAULT CURRENT\_DATE |

2.14. **Inventory**:

* **Description**: This table contains inventory details for various entities in aquariums.

| **Field** | **Type** | **Description** | **Constraints** |
| --- | --- | --- | --- |
| inventory\_id | INTEGER | Unique ID for the inventory entry | PRIMARY KEY |
| aquarium\_id | INTEGER | ID of the associated aquarium | FOREIGN KEY REFERENCES Aquarium(id) |
| entity\_type | TEXT | Type of the entity in the inventory | CHECK IN ('Fish', 'Plant', 'Invertebrate', 'TankMates', 'Equipment') |
| entity\_id | INTEGER | ID of the entity in the inventory | - |
| date\_added | DATE | Date when the entity was added to the inventory | DEFAULT CURRENT\_DATE |

**3. Relationships:**

1. **Supplier to Aquarium**: One to Many
   * One supplier can supply many aquariums.
   * **vendor\_id** in **Aquarium** references **supplier\_id** in **Supplier**.
2. **Supplier to Fish**: One to Many
   * One supplier can supply many fish species.
   * **supplier\_id** in **Fish** references **supplier\_id** in **Supplier**.
3. **Supplier to Equipment**: One to Many
   * One supplier can supply many pieces of equipment.
   * **supplier\_id** in **Equipment** references **supplier\_id** in **Supplier**.
4. **Supplier to Invertebrate**: One to Many
   * One supplier can supply many invertebrates.
   * **supplier\_id** in **Invertebrate** references **supplier\_id** in **Supplier**.
5. **Supplier to Plant**: One to Many
   * One supplier can supply many plants.
   * **supplier\_id** in **Plant** references **supplier\_id** in **Supplier**.
6. **Supplier to SupplierProducts**: One to Many
   * One supplier can have many products.
   * **supplier\_id** in **SupplierProducts** references **supplier\_id** in **Supplier**.
7. **Aquarium to Fish**: One to Many
   * One aquarium can have many fish species.
   * **aquarium\_id** in **Fish** references **id** in **Aquarium**.
8. **Aquarium to Equipment**: One to Many
   * One aquarium can have many pieces of equipment.
   * **aquarium\_id** in **Equipment** references **id** in **Aquarium**.
9. **Aquarium to Invertebrate**: One to Many
   * One aquarium can have many invertebrates.
   * **aquarium\_id** in **Invertebrate** references **id** in **Aquarium**.
10. **Aquarium to Plant**: One to Many
    * One aquarium can have many plants.
    * **aquarium\_id** in **Plant** references **id** in **Aquarium**.
11. **Aquarium to WaterParameter**: One to Many
    * One aquarium can have many water parameter entries.
    * **aquarium\_id** in **WaterParameter** references **id** in **Aquarium**.
12. **Aquarium to MaintenanceTask**: One to Many
    * One aquarium can have many maintenance tasks.
    * **aquarium\_id** in **MaintenanceTask** references **id** in **Aquarium**.
13. **Aquarium to Inventory**: One to Many
    * One aquarium can have many inventory entries.
    * **aquarium\_id** in **Inventory** references **id** in **Aquarium**.
14. **Fish to TankMates**: One to Many
    * One fish species can have many tank mates.
    * **fish\_id** in **TankMates** references **id** in **Fish**.

**4. Indexes:**

* Primary Key Indexes:
  + **Supplier**: **supplier\_id**
  + **Aquarium**: **id**
  + **Images**: **image\_id**
  + **TankMates**: **id**
  + **Fish**: **id**
  + **Equipment**: **id**
  + **Invertebrate**: **id**
  + **Plant**: **id**
  + **WaterParameter**: **id**
  + **SupplierProducts**: **id**
  + **MaintenanceTask**: **task\_id**
  + **TaskList**: **task\_id**
  + **Versioning**: **version\_id**
  + **Inventory**: **inventory\_id**

**5. Constraints:**

1. **CHECK Constraints**:
   * Various CHECK constraints are implemented across tables to ensure that the value inserted/updated in a column adheres to the set of permissible values.
2. **FOREIGN Key Constraints**:
   * Multiple FOREIGN KEY constraints are implemented across tables to maintain the referential integrity of the database.
3. **NOT NULL Constraints**:
   * The NOT NULL constraint enforces a field to always contain a value, meaning that it cannot be left blank.
4. **UNIQUE Constraints**:
   * The UNIQUE constraint ensures that all values in a column are distinct.
5. **DEFAULT Constraints**:
   * The DEFAULT constraint is used to provide a default value for a column.

This documentation provides a comprehensive overview of the structure and relationships within the **Fishy\_v\_02.db** database.