

Implementazione SQL

```
CREATE TABLE Tratta (  
    id INT UNSIGNED NOT NULL AUTO_INCREMENT,  
    costo DECIMAL UNSIGNED NOT NULL,  
    PRIMARY KEY (id)  
) ENGINE = INNODB;
```

```
CREATE TABLE Tratta_urbano (  
    citta VARCHAR(50) NOT NULL UNIQUE,  
    id_tratta INT UNSIGNED NOT NULL,  
    PRIMARY KEY (id_tratta),  
    FOREIGN KEY (id_tratta)  
        REFERENCES Tratta(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
) ENGINE = INNODB;
```

```
CREATE TABLE Tratta_extraurbano (  
    da_km SMALLINT UNSIGNED NOT NULL,  
    a_km SMALLINT UNSIGNED NOT NULL,  
    id_tratta INT UNSIGNED NOT NULL,  
    PRIMARY KEY (id_tratta),  
    UNIQUE (da_km, a_km),  
    FOREIGN KEY (id_tratta)  
        REFERENCES Tratta(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
) ENGINE = INNODB;
```

```
CREATE TABLE Tratta_metro (  
    da_zona TINYINT UNSIGNED NOT NULL,  
    a_zona TINYINT UNSIGNED NOT NULL,  
    id_tratta INT UNSIGNED NOT NULL,  
    PRIMARY KEY (id_tratta),  
    UNIQUE (da_zona, a_zona),  
    FOREIGN KEY (id_tratta)  
        REFERENCES Tratta(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
) ENGINE = INNODB;
```

```
CREATE TABLE Tratta_treno (  
    da VARCHAR(50) NOT NULL,  
    a VARCHAR(50) NOT NULL,  
    id_tratta INT UNSIGNED NOT NULL,  
    PRIMARY KEY (id_tratta),  
    UNIQUE (da, a),  
    FOREIGN KEY (id_tratta)  
        REFERENCES Tratta(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
) ENGINE = INNODB;
```

```
CREATE TABLE Tratta_tram (  
    citta VARCHAR(50) NOT NULL UNIQUE,  
    id_tratta INT UNSIGNED NOT NULL,  
    PRIMARY KEY (id_tratta),  
    FOREIGN KEY (id_tratta)  
        REFERENCES Tratta(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
) ENGINE = INNODB;
```

```
CREATE TABLE Tratta_traghetto (  
    da VARCHAR(50) NOT NULL,  
    a VARCHAR(50) NOT NULL,  
    id_tratta INT UNSIGNED NOT NULL,  
    PRIMARY KEY (id_tratta),  
    UNIQUE (da, a),  
    FOREIGN KEY (id_tratta)  
        REFERENCES Tratta(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
) ENGINE = INNODB;
```

```
CREATE TABLE Carta_trasporto (  
    numero_carta VARCHAR(16) NOT NULL,  
    saldo DECIMAL NOT NULL,  
    data_rilascio DATE NOT NULL,  
    id_proprietario INT UNSIGNED,  
    PRIMARY KEY (numero_carta),  
    FOREIGN KEY (id_proprietario)  
        REFERENCES Cliente(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
) ENGINE = INNODB;
```

```

CREATE TABLE Transazione (
    id INT UNSIGNED NOT NULL AUTO_INCREMENT,
    timestamp TIMESTAMP NOT NULL,
    tipo ENUM("in", "out") NOT NULL,
    id_tratta INT UNSIGNED NOT NULL,
    numero_lettore VARCHAR(25) NOT NULL,
    numero_carta VARCHAR(16) NOT NULL,
    PRIMARY KEY (id),
    FOREIGN KEY (id_tratta)
        REFERENCES Tratta(id)
        ON DELETE CASCADE
        ON UPDATE CASCADE,
    FOREIGN KEY (numero_lettore)
        REFERENCES LettoreNFC(numero_serie)
        ON DELETE CASCADE
        ON UPDATE CASCADE,
    FOREIGN KEY (numero_carta)
        REFERENCES Carta_trasporto(numero_carta)
        ON DELETE CASCADE
        ON UPDATE CASCADE
) ENGINE = INNODB;

```

```

CREATE TABLE Presenza (
    id INT UNSIGNED NOT NULL AUTO_INCREMENT,
    timestamp TIMESTAMP NOT NULL,
    tipo ENUM("in", "out") NOT NULL,
    id_autista INT UNSIGNED NOT NULL,
    numero_lettore VARCHAR(25) NOT NULL,
    PRIMARY KEY (id),
    FOREIGN KEY (id_autista)
        REFERENCES Autista(id)
        ON DELETE CASCADE
        ON UPDATE CASCADE,
    FOREIGN KEY (numero_lettore)
        REFERENCES LettoreNFC(numero_serie)
        ON DELETE CASCADE
        ON UPDATE CASCADE
) ENGINE = INNODB;

```

```

CREATE TABLE LettoreNFC (
    numero_serie VARCHAR(25) NOT NULL,
    data_installazione DATE NOT NULL,
    PRIMARY KEY (numero_serie)
) ENGINE = INNODB;

```

```
CREATE TABLE Autista (  
    id INT UNSIGNED NOT NULL AUTO_INCREMENT,  
    nome VARCHAR(25) NOT NULL,  
    cognome VARCHAR(25) NOT NULL,  
    data_nascita DATE NOT NULL,  
    iban VARCHAR(34) NOT NULL,  
    email VARCHAR(254) NOT NULL,  
    numero_documento VARCHAR(9) NOT NULL UNIQUE,  
    id_indirizzo INT UNSIGNED NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (id_indirizzo)  
        REFERENCES Indirizzo(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
) ENGINE = INNODB;
```

```
CREATE TABLE Cliente (  
    id INT UNSIGNED NOT NULL AUTO_INCREMENT,  
    nome VARCHAR(25) NOT NULL,  
    cognome VARCHAR(25) NOT NULL,  
    email VARCHAR(254) NOT NULL UNIQUE,  
    password VARCHAR(32) NOT NULL,  
    numero_documento VARCHAR(9) NOT NULL UNIQUE,  
    id_indirizzo INT UNSIGNED NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (id_indirizzo)  
        REFERENCES Indirizzo(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
) ENGINE = INNODB;
```

```
CREATE TABLE Indirizzo(  
    id INT UNSIGNED NOT NULL AUTO_INCREMENT,  
    via VARCHAR(25) NOT NULL,  
    provincia VARCHAR(25) NOT NULL,  
    citta VARCHAR(25) NOT NULL,  
    cap VARCHAR(5) NOT NULL,  
    PRIMARY KEY(id)  
) ENGINE = INNODB;
```

```
CREATE TABLE Metodo_pagamento (  
    id INT UNSIGNED NOT NULL AUTO_INCREMENT,  
    tipo_carta ENUM("visa", "mastercard", "postepay", "maestro", "american_express") NOT NULL,  
    numero_carta VARCHAR(16) NOT NULL UNIQUE,  
    nome_titolare VARCHAR(25) NOT NULL,  
    data_scadenza DATE NOT NULL,  
    id_indirizzo INT UNSIGNED NOT NULL,  
    id_cliente INT UNSIGNED NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (id_indirizzo)  
        REFERENCES Indirizzo(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE,  
    FOREIGN KEY (id_cliente)  
        REFERENCES Cliente(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
) ENGINE = INNODB;
```

```
CREATE TABLE Abbonamento (  
    id INT UNSIGNED NOT NULL AUTO_INCREMENT,  
    data_scadenza DATE NOT NULL,  
    id_tratta INT UNSIGNED NOT NULL,  
    id_proprietario INT UNSIGNED NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (id_tratta)  
        REFERENCES Tratta(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE,  
    FOREIGN KEY (id_proprietario)  
        REFERENCES Cliente(id)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
) ENGINE = INNODB;
```