### Bazy Danych 2

### Laboratorium 1

Oracle PL/SQL

Mateusz Łopaciński

### Schemat bazy danych

Obraz zawierający stół

Opis wygenerowany automatycznie

### Tworzenie tabel

#### **People**

**CREATE** **TABLE** People **(**

person\_id INT GENERATED ALWAYS **AS** **IDENTITY** **NOT** **NULL,**

firstname VARCHAR2**(**50**)** **NOT** **NULL,**

lastname VARCHAR2**(**50**)** **NOT** **NULL,**

**CONSTRAINT** People\_pk **PRIMARY** **KEY** **(**person\_id**)**

**);**

#### **Trips**

**CREATE** **TABLE** Trips **(**

trip\_id INT GENERATED ALWAYS **AS** **IDENTITY** **NOT** **NULL,**

name VARCHAR2**(**100**)** **NOT** **NULL,**

country VARCHAR2**(**50**)** **NOT** **NULL,**

trip\_date DATE **NOT** **NULL,**

max\_no\_places INT **NOT** **NULL,**

**CONSTRAINT** Trips\_pk **PRIMARY** **KEY** **(**trip\_id**)**

**);**

#### **Reservations**

**CREATE** **TABLE** Reservations **(**

reservation\_id INT GENERATED ALWAYS **AS** **IDENTITY** **NOT** **NULL,**

trip\_id INT **NOT** **NULL,**

person\_id INT **NOT** **NULL,**

status CHAR**(**1**)** **NOT** **NULL,**

no\_places INT **NOT** **NULL,**

**CONSTRAINT** Reservations\_pk **PRIMARY** **KEY** **(**reservation\_id**)**

**);**

#### **ReservationsLog**

**CREATE** **TABLE** ReservationsLog **(**

log\_id INT GENERATED ALWAYS **AS** **IDENTITY** **NOT** **NULL,**

reservation\_id INT **NOT** **NULL,**

log\_date DATE **NOT** **NULL,**

status CHAR**(**1**)** **NOT** **NULL,**

no\_places INT **NOT** **NULL,**

**CONSTRAINT** ReservationsLog\_pk **PRIMARY** **KEY** **(**log\_id**)**

**);**

### Warunki integralnościowe

Poniżej umieściłem warunki integralnościowe, które nie zostały zdefiniowane w kodzie tworzącym tabele.

#### **Trips**

**ALTER** **TABLE** Trips

**ADD** **CONSTRAINT** Trips\_chk1 **CHECK** **(**max\_no\_places **>** 0**);**

#### **Reservations**

**ALTER** **TABLE** Reservations

**ADD** **CONSTRAINT** Reservations\_fk1 **FOREIGN** **KEY** **(**person\_id**)**

**REFERENCES** People**(**person\_id**);**

**ALTER** **TABLE** Reservations

**ADD** **CONSTRAINT** Reservations\_fk2 **FOREIGN** **KEY** **(**trip\_id**)**

**REFERENCES** Trips**(**trip\_id**);**

**ALTER** **TABLE** Reservations

**ADD** **CONSTRAINT** Reservations\_chk1 **CHECK** **(**status **IN** **(**'n'**,** 'p'**,** 'c'**));**

**ALTER** **TABLE** Reservations

**ADD** **CONSTRAINT** Reservations\_chk2 **CHECK** **(**no\_places **>** 0**);**

#### **ReservationsLog**

**ALTER** **TABLE** ReservationsLog

**ADD** **CONSTRAINT** ReservationLog\_chk1 **CHECK** **(**status **IN** **(**'n'**,** 'p'**,** 'c'**));**

**ALTER** **TABLE** ReservationsLog

**ADD** **CONSTRAINT** ReservationsLog\_chk2 **CHECK** **(**no\_places **>** 0**);**

### Wstawianie danych do tabel

#### **People**

**INSERT** **INTO** People **(**firstname**,** lastname**)**

**VALUES** **(**'Adam'**,** 'Kowalski'**);**

**INSERT** **INTO** People **(**firstname**,** lastname**)**

**VALUES** **(**'Jan'**,** 'Nowak'**);**

**INSERT** **INTO** People **(**firstname**,** lastname**)**

**VALUES** **(**'Andrzej'**,** 'Kowalczyk'**);**

**INSERT** **INTO** People **(**firstname**,** lastname**)**

**VALUES** **(**'Anna'**,** 'Klimek'**);**

**INSERT** **INTO** People **(**firstname**,** lastname**)**

**VALUES** **(**'Zbigniew'**,** 'Zygora'**);**

**INSERT** **INTO** People **(**firstname**,** lastname**)**

**VALUES** **(**'Rafał'**,** 'Noga'**);**

**INSERT** **INTO** People **(**firstname**,** lastname**)**

**VALUES** **(**'Aleksandra'**,** 'Sobczak'**);**

**INSERT** **INTO** People **(**firstname**,** lastname**)**

**VALUES** **(**'Maryla'**,** 'Ordon'**);**

**INSERT** **INTO** People **(**firstname**,** lastname**)**

**VALUES** **(**'Piotr'**,** 'Słota'**);**

**INSERT** **INTO** People **(**firstname**,** lastname**)**

**VALUES** **(**'Aleks'**,** 'Stachowiak'**);**

**COMMIT;**

**W rezultacie otrzymujemy tabelę:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | person\_id | firstname | lastname |
| 1 |  | 1 | Adam | Kowalski |
| 2 |  | 2 | Jan | Nowak |
| 3 |  | 3 | Andrzej | Kowalczyk |
| 4 |  | 4 | Anna | Klimek |
| 5 |  | 5 | Zbigniew | Zygora |
| 6 |  | 6 | Rafał | Noga |
| 7 |  | 7 | Aleksandra | Sobczak |
| 8 |  | 8 | Maryla | Ordon |
| 9 |  | 9 | Piotr | Słota |
| 10 |  | 10 | Aleks | Stachowiak |

**Tabela 4.1. People**

#### **Trips**

**INSERT** **INTO** Trips **(**name**,** country**,** trip\_date**,** max\_no\_places**)**

**VALUES** **(**'wycieczka do Paryza'**,** 'Francja'**,** **TO\_DATE(**'2021-09-03'**,** 'yyyy-mm-dd'**),** 5**);**

**INSERT** **INTO** Trips **(**name**,** country**,** trip\_date**,** max\_no\_places**)**

**VALUES** **(**'wycieczka do Krakowa'**,** 'Polska'**,** **TO\_DATE(**'2022-12-05'**,** 'yyyy-mm-dd'**),** 8**);**

**INSERT** **INTO** Trips **(**name**,** country**,** trip\_date**,** max\_no\_places**)**

**VALUES** **(**'wycieczka do Warszawy'**,** 'Polska'**,** **TO\_DATE(**'2022-04-11'**,** 'yyyy-mm-dd'**),** 12**);**

**INSERT** **INTO** Trips **(**name**,** country**,** trip\_date**,** max\_no\_places**)**

**VALUES** **(**'wycieczka do Madrytu'**,** 'Hiszpania'**,** **TO\_DATE(**'2022-07-02'**,** 'yyyy-mm-dd'**),** 8**);**

**COMMIT;**

**W rezultacie otrzymujemy tabelę:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | trip\_id | name | country | trip\_date | max\_no\_places | | |
| 1 |  | 1 | wycieczka do Paryza | Francja | 2021-09-03 | | 5 |
| 2 |  | 2 | wycieczka do Krakowa | Polska | 2022-12-05 | | 8 |
| 3 |  | 3 | wycieczka do Warszawy | Polska | 2022-04-11 | | 12 |
| 4 |  | 4 | wycieczka do Madrytu | Hiszpania | 2022-07-02 | | 8 |

**Tabela 4.2. Trips**

#### **Reservations**

**INSERT** **INTO** Reservations **(**trip\_id**,** person\_id**,** no\_places**,** status**)**

**VALUES** **(**1**,** 1**,** 1**,** 'n'**);**

**INSERT** **INTO** Reservations **(**trip\_id**,** person\_id**,** no\_places**,** status**)**

**VALUES** **(**1**,** 2**,** 2**,** 'p'**);**

**INSERT** **INTO** Reservations **(**trip\_id**,** person\_id**,** no\_places**,** status**)**

**VALUES** **(**2**,** 1**,** 1**,** 'p'**);**

**INSERT** **INTO** Reservations **(**trip\_id**,** person\_id**,** no\_places**,** status**)**

**VALUES** **(**2**,** 2**,** 1**,** 'c'**);**

**INSERT** **INTO** Reservations **(**trip\_id**,** person\_id**,** no\_places**,** status**)**

**VALUES** **(**2**,** 4**,** 2**,** 'n'**);**

**INSERT** **INTO** Reservations **(**trip\_id**,** person\_id**,** no\_places**,** status**)**

**VALUES** **(**3**,** 5**,** 4**,** 'c'**);**

**INSERT** **INTO** Reservations **(**trip\_id**,** person\_id**,** no\_places**,** status**)**

**VALUES** **(**3**,** 5**,** 3**,** 'n'**);**

**INSERT** **INTO** Reservations **(**trip\_id**,** person\_id**,** no\_places**,** status**)**

**VALUES** **(**3**,** 6**,** 4**,** 'p'**);**

**INSERT** **INTO** Reservations **(**trip\_id**,** person\_id**,** no\_places**,** status**)**

**VALUES** **(**4**,** 7**,** 3**,** 'p'**);**

**INSERT** **INTO** Reservations **(**trip\_id**,** person\_id**,** no\_places**,** status**)**

**VALUES** **(**4**,** 9**,** 1**,** 'c'**);**

**INSERT** **INTO** Reservations **(**trip\_id**,** person\_id**,** no\_places**,** status**)**

**VALUES** **(**4**,** 8**,** 5**,** 'n'**);**

**COMMIT;**

**W rezultacie otrzymujemy tabelę:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | reservation\_id | trip\_id | person\_id | status | no\_places | |
| 1 |  | 1 | 1 | 1 | n | | 1 |
| 2 |  | 2 | 1 | 2 | p | | 2 |
| 3 |  | 3 | 2 | 1 | p | | 1 |
| 4 |  | 4 | 2 | 2 | c | | 1 |
| 5 |  | 5 | 2 | 4 | n | | 2 |
| 6 |  | 6 | 3 | 5 | c | | 4 |
| 7 |  | 7 | 3 | 5 | n | | 3 |
| 8 |  | 8 | 3 | 6 | p | | 4 |
| 9 |  | 9 | 4 | 7 | p | | 3 |
| 10 |  | 10 | 4 | 9 | c | | 1 |
| 11 |  | 11 | 4 | 8 | n | | 5 |

**Tabela 4.3. Reservations**

### Widoki

#### **ReservationsView**

reservations(country,trip\_date,trip\_name, firstname, lastname,reservation\_id,no\_places,status)

**CREATE** **OR** **REPLACE** **VIEW** ReservationsView

**AS**

**SELECT**

t**.**trip\_id**,**

t**.**country**,**

t**.**trip\_date**,**

t**.**name **AS** trip\_name**,**

p**.**person\_id**,**

p**.**firstname**,**

p**.**lastname**,**

r**.**reservation\_id**,**

r**.**no\_places**,**

r**.**status

**FROM** Trips t

**INNER** **JOIN** Reservations r

**ON** r**.**trip\_id **=** t**.**trip\_id

**INNER** **JOIN** People p

**on** p**.**person\_id **=** r**.**person\_id**;**

**SELECT** **\*** **FROM** ReservationsView**;**

**W rezultacie otrzymujemy tabelę:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | trip\_id | country | trip\_date | trip\_name | person\_id | | firstname | lastname | reservation\_id | no\_places | status |
| 1 |  | 1 | Francja | 2021-09-03 | wycieczka do Paryża | | 1 | Adam | Kowalski | 1 | 1 | n |
| 2 |  | 2 | Polska | 2022-12-05 | wycieczka do Krakowa | | 1 | Adam | Kowalski | 3 | 1 | p |
| 3 |  | 1 | Francja | 2021-09-03 | wycieczka do Paryża | | 2 | Jan | Nowak | 2 | 2 | p |
| 4 |  | 2 | Polska | 2022-12-05 | wycieczka do Krakowa | | 2 | Jan | Nowak | 4 | 1 | c |
| 5 |  | 2 | Polska | 2022-12-05 | wycieczka do Krakowa | | 4 | Anna | Klimek | 5 | 2 | n |
| 6 |  | 3 | Polska | 2022-04-11 | wycieczka do Warszawy | | 5 | Zbigniew | Zygora | 6 | 4 | c |
| 7 |  | 3 | Polska | 2022-04-11 | wycieczka do Warszawy | | 5 | Zbigniew | Zygora | 7 | 3 | n |
| 8 |  | 3 | Polska | 2022-04-11 | wycieczka do Warszawy | | 6 | Rafał | Noga | 8 | 4 | p |
| 9 |  | 4 | Hiszpania | 2022-07-02 | Wycieczka do Madrytu | | 7 | Aleksandra | Sobczak | 9 | 3 | p |
| 10 |  | 4 | Hiszpania | 2022-07-02 | Wycieczka do Madrytu | | 8 | Maryla | Ordon | 11 | 5 | n |
| 11 |  | 4 | Hiszpania | 2022-07-02 | Wycieczka do Madrytu | | 9 | Piotr | Słota | 10 | 1 | c |

**Tabela 5.1. Tabela utworzona przez widok ReservationsView**

#### **TripsView**

trips(country,trip\_date, trip\_name,max\_no\_places, no\_available\_places)

**CREATE** **OR** **REPLACE** **VIEW** TripsView

**AS**

**SELECT**

trip\_id**,**

country**,**

trip\_date**,**

name **AS** trip\_name**,**

max\_no\_places**,**

getAvailablePlaces**(**trip\_id**)** **AS** no\_available\_places

**FROM** Trips**;**

**W rezultacie otrzymujemy tabelę:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | trip\_id | country | trip\_date | trip\_name | max\_no\_places | | no\_available\_places |
| 1 |  | 1 | Francja | 2021-09-03 | wycieczka do Paryża | | 5 | 2 |
| 2 |  | 2 | Polska | 2022-12-05 | wycieczka do Krakowa | | 8 | 5 |
| 3 |  | 3 | Polska | 2022-04-11 | wycieczka do Warszawy | | 12 | 5 |
| 4 |  | 4 | Hiszpania | 2022-07-02 | wycieczka do Madrytu | | 8 | 0 |

**Tabela 5.2. Tabela utworzona przez widok TripsView**

#### **AvailableTripsView**

trips(country,trip\_date, trip\_name, max\_no\_places, no\_available\_places)

**CREATE** **OR** **REPLACE** **VIEW** AvailableTripsView

**AS**

**SELECT** **\***

**FROM** TripsView

**WHERE** trip\_date **>** **SYSDATE**

**AND** no\_available\_places **>** 0**;**

**W rezultacie otrzymujemy tabelę:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | trip\_id | country | trip\_date | trip\_name | max\_no\_places | | no\_available\_places |
| 1 |  | 2 | Polska | 2022-12-05 | wycieczka do Krakowa | | 8 | 5 |
| 2 |  | 3 | Polska | 2022-04-11 | wycieczka do Warszawy | | 12 | 5 |

**Tabela 5.2. Tabela utworzona przez widok AvailableTripsView**

### Obiekty

#### **TripParticipantObject i TripParticipantsTable**

**CREATE** **OR** **REPLACE** **TYPE** TripParticipantObject **AS** **OBJECT** **(**

firstname VARCHAR2**(**50**),**

lastname VARCHAR2**(**50**),**

reservation\_id INT**,**

no\_places INT**,**

status CHAR**(**1**)**

**);**

**CREATE** **OR** **REPLACE** **TYPE** TripParticipantsTable **IS** **TABLE** **OF** TripParticipantObject**;**

#### **PersonReservationObject i PersonReservationsTable**

**CREATE** **OR** **REPLACE** **TYPE** PersonReservationObject **AS** **OBJECT** **(**

trip\_id INT**,**

country VARCHAR2**(**50**),**

trip\_date DATE**,**

trip\_name VARCHAR2**(**100**),**

reservation\_id INT**,**

no\_places INT**,**

status CHAR**(**1**)**

**);**

**CREATE** **OR** **REPLACE** **TYPE** PeopleReservationsTable **IS** **TABLE** **OF** PersonReservationObject**;**

#### **AvailableTripObject i AvailableTripsTable**

**CREATE** **OR** **REPLACE** **TYPE** AvailableTripObject **AS** **OBJECT** **(**

trip\_id INT**,**

name VARCHAR2**(**100**),**

country VARCHAR2**(**50**),**

trip\_date DATE**,**

max\_no\_places INT

**);**

**CREATE** **OR** **REPLACE** **TYPE** AvailableTripsTable **IS** **TABLE** **OF** AvailableTripObject**;**

### Funkcje skalarne