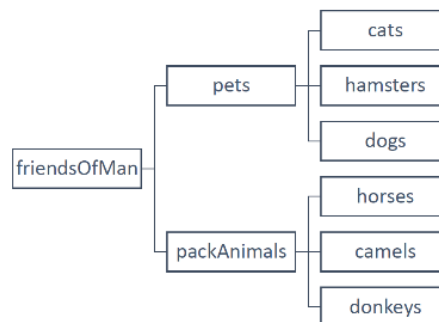**Объектно-ориентированное программирование**

6. Диаграмма классов

См. chartAnimals.pdf

7. Работа с MySQL

- В ранее подключенном MySQL создать базу данных с названием "Human Friends".

```
mysql> CREATE DATABASE HumanFriends;
Query OK, 1 row affected (0,08 sec)

mysql> USE HumanFriends;
Database changed
mysql>
```

- Создать таблицы, соответствующие иерархии из вашей диаграммы классов.

```
Query OK, 0 rows affected (0,10 sec)

mysql> CREATE TABLE Donkeys (id INT AUTO_INCREMENT, Name VARCHAR(20), BirthDay DATE, Commands SET('go', 'Stop', '
Lynx', 'Hop', 'Step', 'Quietly', 'git', 'durr', 'kash', 'khh', 'hap', 'cock', 'Lets_go', 'Hush', 'Crawl', 'face',
 'Give_me_your_paw', 'give_paw', 'Halt', 'Jump', 'Lie', 'Lie_down', 'locate', 'Phew', 'Roll_over', 'Sit', 'Stand'
, 'To_me', 'Tumble', 'Ugh', 'Voice', 'Come_here'), PRIMARY KEY(id));
Query OK, 0 rows affected (0,08 sec)

mysql> CREATE TABLE Hamsters (id INT AUTO_INCREMENT, Name VARCHAR(20), BirthDay DATE, Commands SET('go', 'Stop',
'Lynx', 'Hop', 'Step', 'Quietly', 'git', 'durr', 'kash', 'khh', 'hap', 'cock', 'Lets_go',
Hush', 'Crawl', 'face', 'Give_me_your_paw', 'give_paw', 'Halt', 'Jump', 'Lie', 'Lie_down', 'locate', 'Phew', 'Rol
l_over', 'Sit', 'Stand', 'To_me', 'Tumble', 'Ugh', 'Voice', 'Come_here'), PRIMARY KEY(id));

Query OK, 0 rows affected (0,07 sec)

mysql> CREATE TABLE Horses (id INT AUTO_INCREMENT, Name VARCHAR(20), BirthDay DATE, Commands SET('go', 'Stop', 'L
ynx', 'Hop', 'Step', 'Quietly', 'git', 'durr', 'kash', 'khh', 'hap', 'cock', 'Lets_go', 'Hu
sh', 'Crawl', 'face', 'Give_me_your_paw', 'give_paw', 'Halt', 'Jump', 'Lie', 'Lie_down', 'locate', 'Phew', 'Roll_
over', 'Sit', 'Stand', 'To_me', 'Tumble', 'Ugh', 'Voice', 'Come_here'), PRIMARY KEY(id));
Query OK, 0 rows affected (0,07 sec)

mysql> SHOW TABLES;
+----------------------+
| Tables_in_HumanFriends |
+----------------------+
| Camels               |
| Cats                 |
| Dogs                 |
| Donkeys              |
| Hamsters             |
| Horses               |
+----------------------+
6 rows in set (0,02 sec)

mysql>
```

- Заполнить таблицы данными о животных, их командах и датами рождения.


```
root@norb-linux: /home/norb/itog_work

mysql> INSERT INTO Hamsters (Name, BirthDay, Commands) VALUES ('Grey',20090504,('lets_go,stop,step'));
Query OK, 1 row affected (0,01 sec)

mysql> SELECT * FROM Cats;
+----+-------+------------+------------------------------------+
| id | Name  | BirthDay   | Commands                           |
+----+-------+------------+------------------------------------+
|    |       | 2020-05-15 | Lie_down,Sit,Voice                 |
|  9 | Casi  | 2022-03-05 | Come_here                          |
| 10 | Harry | 2021-12-12 | Give_me_your_paw,Voice,Come_here   |
+----+-------+------------+------------------------------------+
3 rows in set (0,00 sec)

mysql> SELECT * FROM Dogs;
+----+-------+------------+------------------------------------+
| id | Name  | BirthDay   | Commands                           |
+----+-------+------------+------------------------------------+
|  1 | Leo   | 2017-09-10 | Crawl,Tumble,Voice,Come_here       |
|  2 | Simbo | 2015-05-13 | Crawl,Lie_down,Tumble,Come_here    |
|  3 | Perry | 2023-08-31 | Lie,Sit,Stand                      |
+----+-------+------------+------------------------------------+
3 rows in set (0,00 sec)

mysql> SELECT * FROM Donkeys;
+----+-------+------------+--------------------------------------+
| id | Name  | BirthDay   | Commands                             |
+----+-------+------------+--------------------------------------+
|  1 | Marsy | 2019-08-11 | face,Give_me_your_paw,Lie,Sit,To_me,Ugh |
|  2 | Lessy | 2024-07-08 | Roll_over                            |
|  3 | Dag   | 2023-12-21 | Sit                                  |
+----+-------+------------+--------------------------------------+
3 rows in set (0,00 sec)
```

```
mysql> SELECT * FROM Horses;
+----+--------+------------+-------------------------------+
| id | Name   | BirthDay   | Commands                      |
+----+--------+------------+-------------------------------+
|  1 | Sophi  | 2005-04-15 | go,Stop,Hop,Step,Quietly      |
|  2 | Berry  | 2007-02-06 | go,Stop,Lynx,Hop,Step,Quietly |
|  3 | Demian | 2010-06-20 | go,Stop,Step,Quietly          |
+----+--------+------------+-------------------------------+
3 rows in set (0,00 sec)

mysql> SELECT * FROM Hamsters;
+----+--------+------------+----------------------+
| id | Name   | BirthDay   | Commands             |
+----+--------+------------+----------------------+
|  1 | Hipper | 2008-07-24 | Stop,hap,Lets_go     |
|  2 | Zeus   | 2017-11-19 | Stop,Hop,Lets_go,Hush |
|  3 | Grey   | 2009-05-04 | Stop,Step,Lets_go    |
+----+--------+------------+----------------------+
3 rows in set (0,00 sec)

mysql> SELECT * FROM Camels;
+----+-------+------------+---------------------+
| id | Name  | BirthDay   | Commands            |
+----+-------+------------+---------------------+
|  1 | Bemby | 2014-10-05 | git,durr,kash,cock  |
|  2 | Bart  | 1999-01-01 | Lynx,git,durr,hap,cock |
|  3 | Manny | 2003-02-27 | git,durr,hap        |
+----+-------+------------+---------------------+
3 rows in set (0,00 sec)

mysql>
```

- Удалить записи о верблюдах и объединить таблицы лошадей и ослов.

```
mysql> DELETE FROM Camels;
Query OK, 3 rows affected (0,01 sec)

mysql> SELECT * FROM Camels;
Empty set (0,00 sec)

mysql> CREATE TABLE packAnimals (id INT AUTO_INCREMENT, Type VARCHAR(12), Name VARCHAR(20), BirthDay DATE, Comman
ds SET('go', 'Stop', 'Lynx', 'Hop', 'Step', 'Quietly', 'git', 'durr', 'kash', 'khh', 'hap', 'cock', 'Lets_go', 'H
ush', 'Crawl', 'face', 'Give_me_your_paw', 'give_paw', 'Halt', 'Jump', 'Lie', 'Lie_down', 'locate', 'Phew', 'Roll
_over', 'Sit', 'Stand', 'To_me', 'Tumble', 'Ugh', 'Voice', 'Come_here'), PRIMARY KEY(id));
Query OK, 0 rows affected (0,06 sec)

mysql> INSERT INTO packAnimals (Type, Name, BirthDay, Commands) SELECT 'Horse', Name, BirthDay, Commands FROM Hor
ses UNION ALL SELECT 'Camel', Name, BirthDay, Commands FROM Camels UNION ALL SELECT 'Donkey', Name, BirthDay, Com
mands FROM Donkeys;
Query OK, 6 rows affected (0,02 sec)
Records: 6  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM packAnimals;
+----+--------+--------+------------+-----------------------------------------+
| id | Type   | Name   | BirthDay   | Commands                                |
+----+--------+--------+------------+-----------------------------------------+
|  1 | Horse  | Sophi  | 2005-04-15 | go,Stop,Hop,Step,Quietly                |
|  2 | Horse  | Berry  | 2007-02-06 | go,Stop,Lynx,Hop,Step,Quietly           |
|  3 | Horse  | Demian | 2010-06-20 | go,Stop,Step,Quietly                    |
|  4 | Donkey | Marsy  | 2019-08-11 | face,Give_me_your_paw,Lie,Sit,To_me,Ugh |
|  5 | Donkey | Lessy  | 2024-07-08 | Roll_over                               |
|  6 | Donkey | Dag    | 2023-12-21 | Sit                                     |
+----+--------+--------+------------+-----------------------------------------+
6 rows in set (0,00 sec)

mysql>
```

```
mysql> CREATE TABLE Pets (id INT AUTO_INCREMENT, Type VARCHAR(12), Name VARCHAR(20), BirthDay DATE, Commands SET(
'go', 'Stop', 'Lynx', 'Hop', 'Step', 'Quietly', 'git', 'durr', 'kash', 'khh', 'hap', 'cock', 'Lets_go', 'Hush', '
Crawl', 'face',
'Give_me_your_paw', 'give_paw', 'Halt', 'Jump', 'Lie', 'Lie_down', 'locate', 'Phew', 'Roll_over', 'Sit', 'Stand',
 'To_me', 'Tumble', 'Ugh', 'Voice', 'Come_here'), PRIMARY KEY(id));
Query OK, 0 rows affected (0,05 sec)

mysql> INSERT INTO Pets (Type, Name, BirthDay, Commands) SELECT 'Cat', Name, BirthDay, Commands FROM Cats UNION A
LL SELEC
T 'Dog', Name, BirthDay, Commands FROM Dogs UNION ALL SELECT 'Hamster', Name, BirthDay, Commands FROM Hamsters;
Query OK, 9 rows affected (0,01 sec)
Records: 9  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM Pets;
+----+---------+--------+------------+--------------------------------+
| id | Type    | Name   | BirthDay   | Commands                       |
+----+---------+--------+------------+--------------------------------+
|  1 | Cat     | Penny  | 2020-05-15 | Lie_down,Sit,Voice             |
|  2 | Cat     | Casi   | 2022-03-05 | Come_here                      |
|  3 | Cat     | Harry  | 2021-12-12 | Give_me_your_paw,Voice,Come_here |
|  4 | Dog     | Leo    | 2017-09-10 | Crawl,Tumble,Voice,Come_here   |
|  5 | Dog     | Simbo  | 2015-05-13 | Crawl,Lie_down,Tumble,Come_here |
|  6 | Dog     | Perry  | 2023-08-31 | Lie,Sit,Stand                  |
|  7 | Hamster | Hipper | 2008-07-24 | Stop,hap,Lets_go               |
|  8 | Hamster | Zeus   | 2017-11-19 | Stop,Hop,Lets_go,Hush          |
|  9 | Hamster | Grey   | 2009-05-04 | Stop,Step,Lets_go              |
+----+---------+--------+------------+--------------------------------+
9 rows in set (0,00 sec)

mysql>
```

- Создать новую таблицу для животных в возрасте от 1 до 3 лет и вычислить их возраст с точностью до месяца.

```
mysql> CREATE TABLE YoungAnimals (id INT AUTO_INCREMENT, Type VARCHAR(12), Name VARCHAR(20), BirthDay DATE, Comma
nds SET('go', 'Stop', 'Lynx', 'Hop', 'Step', 'Quietly', 'git', 'durr', 'kash', 'khh', 'hap', 'cock', 'Lets_go', '
Hush', 'Crawl', 'face', 'Give_me_your_paw', 'give_paw', 'Halt', 'Jump', 'Lie', 'Lie_down', 'locate', 'Phew', 'Rol
l_over', 'Sit', 'Stand', 'To_me', 'Tumble', 'Ugh', 'Voice', 'Come_here'), Age TEXT, PRIMARY KEY(id));
Query OK, 0 rows affected (0,05 sec)

mysql> SELECT * FROM YoungAnimals;
Empty set (0,00 sec)

mysql> INSERT INTO YoungAnimals (Type, Name, BirthDay, Commands, Age) SELECT Type, Name, BirthDay, Commands, CONC
AT(TIMESTAMPDIFF(MONTH, BirthDay, CURDATE()) div 12, ' year, ', TIMESTAMPDIFF(MONTH, BirthDay, CURDATE()) % 12, '
 month') FROM Pets WHERE TIMESTAMPDIFF(MONTH, BirthDay, CURDATE()) >= 12 AND TIMESTAMPDIFF(MONTH, BirthDay, CURDA
TE()) < 36 UNION ALL SELECT Type, Name, BirthDay, Commands, CONCAT(TIMESTAMPDIFF(MONTH, BirthDay, CURDATE()) div
12, ' year, ', TIMESTAMPDIFF(MONTH, BirthDay, CURDATE()) % 12, ' month') FROM packAnimals WHERE TIMESTAMPDIFF(MON
TH, BirthDay, CURDATE()) < 36;
Query OK, 5 rows affected (0,02 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM YoungAnimals;
+----+--------+-------+------------+----------------------------------+------------------+
| id | Type   | Name  | BirthDay   | Commands                         | Age              |
+----+--------+-------+------------+----------------------------------+------------------+
|  1 | Cat    | Casi  | 2022-03-05 | Come_here                        | 2 year, 7 month  |
|  2 | Cat    | Harry | 2021-12-12 | Give_me_your_paw,Voice,Come_here | 2 year, 10 month |
|  3 | Dog    | Perry | 2023-08-31 | Lie,Sit,Stand                    | 1 year, 1 month  |
|  4 | Donkey | Lessy | 2024-07-08 | Roll_over                        | 0 year, 3 month  |
|  5 | Donkey | Dag   | 2023-12-21 | Sit                              | 0 year, 10 month |
+----+--------+-------+------------+----------------------------------+------------------+
5 rows in set (0,00 sec)

mysql>
```

- Объединить все созданные таблицы в одну, сохраняя информацию о принадлежности к исходным таблицам.

```
                              root@norb-linux: /home/norb/itog_work
'Crawl',
'face', 'Give_me_your_paw', 'give_paw', 'Halt', 'Jump', 'Lie', 'Lie_down', 'locate', 'Phew', 'Roll_over', 'Sit'
, 'Stand',
'To_me', 'Tumble', 'Ugh', 'Voice', 'Come_here'), PRIMARY KEY(id));
Query OK, 0 rows affected (0,04 sec)

mysql> SELECT * FROM FriendsOfMan;
Empty set (0,00 sec)

mysql> INSERT INTO FriendsOfMan (Type, Name, BirthDay, Commands) SELECT Type, Name, BirthDay, Commands FROM Pet
s UNION ALL SELECT Type, Name, BirthDay, Commands FROM packAnimals;
Query OK, 15 rows affected (0,02 sec)
Records: 15  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM FriendsOfMan;
+----+--------+--------+------------+------------------------------------------+
| id | Type   | Name   | BirthDay   | Commands                                 |
+----+--------+--------+------------+------------------------------------------+
|  1 | Cat    | Penny  | 2020-05-15 | Lie_down,Sit,Voice                       |
|  2 | Cat    | Casi   | 2022-03-05 | Come_here                                |
|  3 | Cat    | Harry  | 2021-12-12 | Give_me_your_paw,Voice,Come_here         |
|  4 | Dog    | Leo    | 2017-09-10 | Crawl,Tumble,Voice,Come_here             |
|  5 | Dog    | Simbo  | 2015-05-13 | Crawl,Lie_down,Tumble,Come_here          |
|  6 | Dog    | Perry  | 2023-08-31 | Lie,Sit,Stand                            |
|  7 | Hamster| Hipper | 2008-07-24 | Stop,hap,Lets_go                         |
|  8 | Hamster| Zeus   | 2017-11-19 | Stop,Hop,Lets_go,Hush                    |
|  9 | Hamster| Grey   | 2009-05-04 | Stop,Step,Lets_go                        |
| 10 | Horse  | Sophi  | 2005-04-15 | go,Stop,Hop,Step,Quietly                 |
| 11 | Horse  | Berry  | 2007-02-06 | go,Stop,Lynx,Hop,Step,Quietly            |
| 12 | Horse  | Demian | 2010-06-20 | go,Stop,Step,Quietly                     |
| 13 | Donkey | Marsy  | 2019-08-11 | face,Give_me_your_paw,Lie,Sit,To_me,Ugh  |
| 14 | Donkey | Lessy  | 2024-07-08 | Roll_over                                |
| 15 | Donkey | Dag    | 2023-12-21 | Sit                                      |
+----+--------+--------+------------+------------------------------------------+
15 rows in set (0,00 sec)

mysql>
mysql>
```