# **Search Gallery**

#### operation manual, 2022

Image Gallery with text descriptions, you can search by keywords/classes, using synonyms and generalizations, building you own expert system with rules and facts for fast and suitable image search.

Results can be collected, sorted, stored and viewed as slides and shared with standard iOS tools

Starting application, you get a launch screen for a while.

The launch screen will be displayed until the application has read all the image files in the directory. This may take tens of seconds if there are tens of thousands of Images in the gallery.

Privacy notes: no information is collected or sending elsewhere by this app. This application presented "as is" without any warranty of data loss.

Manual based on test database included Known problems are presented at the end of this file

# SEARCH GALLARY

# Just a second

Preparing interface...

## Quick start

- 1. Open application
- 2. Tap Photos tab
- 3. Tap "+" icon to browse you phone gallery

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Search	Photos	DB	Synonim	Setup

- 4. Select pictures you want to add tapping them
- 5. Tap "Add" in up right corner to finish
- 6. Tap picture to select
- 7. Add description in the box above, write what you see on the picture
- 8. Press "**Arrow to box**" button to save written description
- 9. After adding descriptions to pictures tap "Search" tab to back search





Christmas, Zhuravlevka, flashlight, violet, winter forest







amber, grapes, magenta, orchid, peach, sunny, window Christmas wreath, lights, my home



- 10. Type in the box what you want to find
- 11. Tap "Big lens" button right
- 12. You got the result!









Saint Nicholas, Zhuravlevka, flashlight, forest, heart, winter

flashlight, violet, winter forest





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#### Use demo DB

You can download and experiment with demo DB form link

- 1. Download demo.zip to **Files** application folder
- 2. Unzip

3. In **Setup** tab choose **Database menu** then **Files** and **Restore** item



3 items

-0

Shared

Browse

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Recents

9:21	📚 🗖
Us	e biometric ID
Au	to refresh image collection
-   +	Photo not sorted
-   +	Search result not sorted
-   +	Inference chain or description
-   +	No label while play
-   +	3 view column(s)
Slide show d	elay 2.0 sec, video 7.0



4. Select demo folder ant tap Open

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- 5. You may asked to begin restoration process or erase old files tap **Ok**
- 9:22 .... 🔶 🔲 **〈** On My iPhone demo 🗸  $\odot$ Open Q Search DBImgage OrigImage 3 items 88 items and the second s





9:25					<b>?</b>			
	Use biometric I	D						
	Auto refresh im	age collec	tion					
	- + Photo not sorted							
	- + Search result not sorted							
	+ Inferen	ce chain o	r descri	ption				
-	+ No labe	el while pla	ıу					
-	+ 3 view	column(s)						
Slide sho	w delay 2.0	sec, vi	deo	7.0				
DB ready Restore Restore Check re	Cancel	[OK] to res	tore Ok	ore				
DB:		defaul	t					
Data ver 0.5	base menu		Pictu	res me	enu			
Q Search	Photos	DB	Synor	nim	Setup			

- 6. When restoration completes you got message **Restored [...] from demo**
- Tap Search tab and Big lens button after - you should see something like this(right pic)

Enjoy





#### How to search

This application can search thru pictures descriptions in two ways:

- context search of input characters
- rule and facts based search defined in database and synonyms, like expert systems

If it's not defined explicitly, all ways applied simultaneously

If sing "!" after word used – it switch off rule based search

#### **Context search**

Very simple and use 3 operators:

< (left angle bracket) - input characters should be from the beginning of the word

> (right angle bracket) - input characters should be at the end of word

. (dot) - input characters can be everywhere in the word

Lets look the difference of using context search "flower" from beginning, at the end and anywhere





yellow flowers

flowers



DB

Synonim

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Search

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Photos



#### **Rules based search**

If you set the rules, how your "pictures world" will be catalogued, for example, you set, that flowers contains: cornflower, cyclamen, dandelion, hyacinth, marigold flower, narcissus, wild rose, yellow flowers, application will find that fact in the descriptions of all picture you have in the base

Let us see the difference between context search word "flower" everywhere in the phrase and rule "flower" that found additional pictures with narcissus, dandelion, cyclamen



#### 8:50

.... 🔶 🔳

flowers: cornflower, cyclamen, dandelion, hyacinth, marigold flower, narcissus, wild rose, yellow flow...





flowers: cornflower, cyclamen, dandelion, hyacinth, marigold flower, narcissus, wild rose, yellow flowers

animals: pets, wild animals

area: air, countries, ground, territory, water

countries: Belgium, Germany, Poland, Russia, Spain, Ukr...

dog: doggy, puppies

event: holiday, war, work

family: ancle, aunt, dad, daughter, grand daughter, gran...

female: aunt, daughter, girl, girlfriend, grand daughter,...

flowers: cornflower, cyclamen, dandelion, hyacinth, mar...

hairdresser: barber, wigs

happiness: holidays, morning, sunny

health: doctor, gym, hospital, relaxation, sleep

holiday: Christmas, break, parade, playday

kitchen: cooker, electric kettle, oven, waffle oven

male: ancle, boy, boyfriend, dad, grand father, grand so...

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Search	Photos	DB	Synonim	Setup

How to protect your pictures and movies?

There are two ways to protect your data:

- Go to Setup tab, press Database menu and select New DB, just enter desired DB name and cryptokey with conformation check, which will be used for Apple CryptoKit AES algorithm. Every image, GIF or movie you will add to this base will be immediately encrypted without any temporary files, etc. Also, no unprotected duplicates will be generated while you are browsing protected base.
- If you already have a base, you can simply go to the Protect sub menu and select Encrypt base. Just wait some time for all your data became protected. Encrypted files just written over your original images make impossible attempts to restore originals

Very recommended to store cryptokeys in a safe place or use iOS password valet (save as login (db name) and password for a dummy website like "lala.com", "www.site"). We never collect your data and have no algorithm for password restoration

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Auto	refresh image collection	
-   +	Photo not sorted	
- +	Search result not sorte	ed
-   +	Inference chain or des	cription
-   +	No label while play	
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Slide show del	lay 2.0 sec, video	7.0
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DB

**Pictures menu** 

Synonim

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Setup

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> Repair

> Files

Rename DB

Delete DB

New DB

ver 0.5

Q

Search

Database menu

Photos

7:06

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#### Input name for new base and confirm

#### All APPLICATION DESCRIPTION

#### Search tab opens immediately

In the field above, you can enter a search query of tags (words, phrases of two or more words), separated by a comma.

Below is the search button, hint and interface switch button (left arrow)

At the button there are tabs for switching between: Search – here we are Pictures - adding pictures to the gallery and picture descriptions DB - adding new classes of image descriptions to the base Synonyms - synonyms database operations Setup - settings for app

4:59		4	î <b>D</b>
Enter request like: David friend, w day	ioman, j	oets,	Q
Hint: Type request above and Search, swipe 2 fingers left to clear	<b>•</b>		



First menu button on Search page:

**Catalog** (**folder**) – all tags that are in the photo database are displayed

**Clear edit** bar (**trash** can) - clear input request

Clear selected pictures (x in a box)

**Deselect** all pictures

Share what you find - files can be sent by mail or via instant messengers, saved in files

Application supports simultaneously two image collection:

- Current query
- All for collecting images from several queries, adding them

Second menu button on Search page for current **Query** collection:

Add selectes images from current query to All(common) collection then switch to All collection

**Clear query** – clear results of current query

Show All - switch view to All collection





You can join results of different queries in **All** collection

Second menu button on Search page for All collection:

**Undo last** – undo last changes for All collection(add delete)

**Del selected** – delete selected images from collection

**Show Query** – switch to **Query** collection view

#### Files submenu:

**Merge collection** – merge saved list of references from file to current collection, same references not merged

**Save collection** – save list of references for collected images to file

Save images – share selected images anywhere

**Third menu button** – is extended query editor, where items Catalog is also accessible for big queries







Hint Enter request, each item separeted "," - search by rules "!"- exect "?"- exect and synonims

before item place "^" - for not

When entered the search query, in our example: "hairdresser", press the "Search" button and get search result as thumbnails of the selected images with captions, which match the entered query

The total number of found images will appear in the hint line

Search time VERY depends on rules and facts complexity and number of stored images, progress is shown while searching

Pictures can be scrolled, long tap on collection image - it will be shown in maximum size

Tags entered with coma should much all in shown images

5:32 hairdresser -Found:query: 3 in 0.018 sec





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Cala d'Or, hairdresser



Lviv, barber

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#### Maximum/zoom image view

Selected image will appear in full screen with buttons: **Close (x)** - close the window **Share (square with arrow)** - share a picture with other applications

#### With gestures, you can:

Touch with one finger - a slide show will start from all selected pictures at the show interval specified in the settings as demo. Touch again in demo mode - stop demo Swipe right/left - swipe previous, next picture Zoom in/Zoom out – Zoom image in detail with two fingers

Below image there is a full description of the image. Description can be not to show in settings





cooker, hyacinths, flower bulbs

**Zoom in/ Zoom out** – Zoom image in detail allowed with gesture 2 fingers Maximum zoom is 5 times

1:53 .... <







Clicking on the button with a folder picture, a Catalog Dictionary of all keywords / tags entered as a description will be displayed with number of their appearance in image descriptions.

They can be clicked, scrolled, when clicked, they are added to the search bar separated by commas

For example, let's choose "winter, Antwerp"

Close the list and return to the search

As a result of the search, we get 4 images where there are such tags

Buttons:

**Delete item** – delete last description item **Close**(X) – close this window





5:34

winter, Antwerp

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Q

Setup

Search results can be shared or saved to files.

To do this, you can select one or more pictures and click the share button.

First, results are saved to telephone file's folders, then they can be transferred to phone's photo gallery

Transfer to messengers occurs immediately





"Photo" tab you can manage the image database (buttons from left to right):

- **update pictures and descriptions**, if "limit to description" is set (in settings), then here you can set a tag (one) by which pictures will be selected without taking into account synonyms and classes here

#### - add a picture (+)

- in one picture selecting mode - this is the addition of new pictures to the database
 - in multi-picture selection mode - is a batch adding description items added to all selected pictures

- delete the picture (-)

- in one picture selecting mode this is the deletion of the selected picture
- in **the multi-picture selection mode** is a batch deletion description items in the selected pictures

- clear input field (basket), you can also swipe it with two fingers to the left

- image selection mode:

- one empty square selection of only one picture
- four empty squares selection of several pictures

- square with "x" - deselect pictures

- **box with an arrow inside** - saving edited description for selected picture (does not work in multi-picture selection mode)



In single picture selection mode - you click on the "+" button, picture selector from the phone gallery appears (screen on the left) to add pictures in the base

In the multi-picture selection mode, a hint is displayed to use the +/- buttons to add the entered description to the selected pictures (screen on the right)



Show Selected (3)



When multiple images are selected number of selected images is entered in the tooltip at the top.

You can cancel the selection by clicking on **box with a cross** on the right (left screen)

Also, in this tab using gestures: **long press** you can view the picture in full (right screen) You can do with gestures **Zoom in/ Zoom out** – Zoom image in detail









Lviv, street cats

In the full picture(left screen), using gestures:

- **one tap** - turn off all buttons for easy viewing

- **double tap** - view Exif pictures (right screen)

- by **swiping it to the right / left** you can view the previous / next pictures in order



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Lviv, street cats

#### 2:37 **?** Try reading Exif Exif: { ColorModel = RGB; DPIHeight = 72; DPIWidth = 72;Depth = 8;Orientation = 1;PixelHeight = 3024; PixelWidth = 4032; PrimaryImage = 1; ProfileName = "Display P3"; "{Exif}" = { ApertureValue = "2.970853653853539"; BrightnessValue = "7.720444728843385"; ColorSpace = 65535; ComponentsConfiguration = 1, 2, 3, 0 ); CompositeImage = 2;DateTimeDigitized = "2022:04:13 14:00:00"; DateTimeOriginal = "2022:04:13 14:00:00"; ExifVersion = ( 2, 3, 2 ); ExposureBiasValue = 0; ExposureMode = 0;ExposureProgram = 2; ExposureTime = "0.003105590062111801"; FNumber = "2.8"; Flash = 16;FlashPixVersion = ( 1, Ó ); FocalLenIn35mmFilm = 77; FocalLength = 9; ISOSpeedRatings = ( Close 32

2:38

#### DB Tab

Editing a classifier (classes and concepts)

Search here is based on concepts:

- whole: its elements, like

"water: river, sea, ocean"

"river: Thames, Nile, Amazon", etc

- synonyms, like:

"cat, kitty"

"man, men" (to avoid plural if you like)

You can set an infinite number of such relations, they will be used while searching, for example, you set

Classes

"Joe Company: Katya, Pasha, Eva, Lisa, Sergey"

"Guys: Pasha, Sergey, Ivan, Kostya"

"Girls: Katya, Eva, Lisa, Natasha, Tatyana"

Synonyms

"Girlfriends, Girls"

And uploaded photos which will be marked with tags, described in these rules and then enter a query: " Joe Company, Girlfriends", then photos marked with tags: Katya, Eva, Liza will be displayed





Application is provided with demo base, which is presented on screen shot.

You can edit search rule's base in this tab using buttons:

Refresh (circular arrow) - display the current database after changes

Add class(+) – add rule as text "whole: element 1, element 2, element 3, ...."

"whole" is separated by a colon, elements are separated by commas, an element can be either one word or several words or other characters, separated by commas

Delete class(-) - the selected rule will be deleted

Clear input field (basket) - clears the input field for convenience

Save (arrow in the box) - saves the edited class

Tap class/rule for selection and editing

9:22							
street animals: dove, street cats, street dogs							
street animals: dove, street cats, street dogs							
ocean: Arctic ocean, Atlantic ocean, Indian ocean, Pacifi							
<b>people:</b> female, friend, male, stranger							
pets: cat, dog							
profession: barber, coach, doctor, teacher							
<b>rest:</b> amusement, enjoyment, relaxation, sleep							
river: river Kharkiv							
romantic: rose petals							
sadness: evening, sunset, violet							
<b>sea:</b> Black Sea, Mediterranean Sea							
street animals: dove, street cats, street dogs							
<b>time:</b> day, evening, morning, night							
water: galf, lake, ocean, river, sea, spring							
wild animals: lion, puma, snake, street animals							
world: animals, area, people, time							
QImage: Constraint of the second							

#### Synonyms tab

Here you can add, modify and delete synonym rules, which are separated by commas

One rule can contain any number of words or phrases that you consider synonymous

Everything is based on your idea and convenience.





The controls in Synonyms tab are similar DB Tab:

Refresh (circular arrow) - display the current database of synonyms after changes

Add synonyms(+) – add a new synonym rule in the form of the text "synonym 1, synonym 2, synonym 3, ....". Synonyms are separated by commas, synonyms can be either one word or several words or other text marks separated by commas

Delete synonym rule(-) - the selected rule will be deleted

Clear input field (basket) - clears the input field for convenience

Save (arrow to box) - saves the edited set/rule of synonyms

10:18		<b>?</b> 🔲
>> While refresh limit ouput type word h	nere	
boys, boy		
cat, kitty		
episode, incident, occasion, ever	nts, event, pł	nenomenon
lion, leo		
men, man		
people, human		
pets, pet		
schedule, time		
stranger, strangers		
wild animals, wild animal		
women, woman		



#### Setup tab: Switches:

- Use FaceID instead current crypto key reenter

- Automatically update views after making changes in picture descriptions, rules, etc

- Sort order for pictures view presentation

- Sort order for search results (right: search result for "my fight" sorted by date showing only creation date)

- Choose what information will be shown on image labels

- image reference(name of the physical file)

- creation date

- picture description
- their combinations

- Choose when information picture label will be displayed:

- show always
- do not show in slide mode
- never show

- Delay for showing pictures and first interval in sec of the video in slide mode

 Number of columns in image collection – changes Photo and Search views(left: 3 columns view)

9.42						
	Use bio	metric ID				
	Auto re	fresh image collection				
-	+	Photo not sorted				
-	+	Search result not sorted				
-	+	Inference chain or description				
-	+	No label while play				
-	+	3 view column(s)				
Slide sho	w delay	2.0 sec, video 7.0				
Crypto o Crypto o	off					

2

0.40

Crypto off crypto off readBasesFromFiles: for: default ReadDB:picsBDFile ok ReadDB:dbFile ok ReadDB:synDBFile ok Refresh image view to see changes Starting DB: default DB ready: true





**Current DB name and switch DB button** – pressing you get change DB window

#### **Buttons: Data Base menu**

This menu consists of three submenu:

- Protect crypto protection of you base andimages
- **Repair** some test and image file conversions
- Files the data base files operation<, like export, backup, etc

And common used items:

- New DB create new database
- Delete DB delete selected DB
- Rename DB rename DB

#### File submenu

- **Backup** – full copy of database and all original pictures

- **Restore** – restore previously backuped database

- **Save base** and make them available (transfer a copy to another device) - for observing (next page left screen)

- Load base – load backup data base (class, synonyms and pictures)

Use bi	iometric ID						
Auto refresh image collection							
-   +	- + Photo not sorted						
-   +	Search result not sorted						
-   +	Inference cha	in or des	scription				
-   +	No label while	e play					
- +	3 view colum	n(s)					
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-	Files				
	Restore		T		
	BackUp		T		
	Load base				
C	Save base				
D	atabase menu		Pict	ures me	enu
ver 0	.5				
Q		:=		=	<u>=</u>
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#### **Repair submenu**

- Test base - the correctness of the rules is controlled by the system upon entry, however, there may be situations when an error can occur, for example, when restoring databases from a backup. For this, a mode for checking the rules of the base is provided.

- Rebuild thumbnails – rebuild picture miniatures and update information

- PNG -> JPG – conversion all png lossless to jpg max quality

- GIF -> MP4 - conversion all old gif to mp4 video

IMPORTANT: mobile device it's not good solution for butch video conversion, may cause memory shortage fatal error

#### Protect submenu

EnterCryptokey – enter cryptokey again if missed

Decrypt base – make base and images acceceable for other view

Encrypt base -

9:28						ŝ
	Use bio	metric ID	)			
	Auto ref	resh ima	ige col	lection		
-	+	Photo no	ot sort	ed		
-	+	Search r	esult r	not sorte	ed	
-	+	Inferenc	e chaiı	n or des	cription	
-	+	No label	while	play		
	+	3 view c	olumn	(s)		
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Decrypt base					
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#### **Create pictures base**

You can create separate bases for your needs, rules and facts for each base are created and used separately.

If you enter crypto key while creating new base – base will be encrypted from the beginning.

If necessary, you can save rules and synonyms from one database, and then read them into another database. When reading rules from files, they are completely replaced. Merge is not supported for now.

#### Delete picture base

You can delete the bases you created.

6	<b>?</b> 🔳	7:04	🗢 🔳
Create new DB		Dele	ete DB
		Sele	ct from:
fun		✓ Select from	n:
Crypto key		default	
Confirm crypto key		fun	
$\checkmark$ $\boxtimes$			
Input name for new base and cor	firm		

#### Back up and Restore

You can save the contents of your databases to a directory of your choice, as well as restore your databases from this directory from the state in which you saved them.

Before saving, the catalog is cleared, and when restoring, the database into which the restoration takes place is cleared also. What warnings will be displayed.





#### Change bases and rename

You can switch between databases and rename them if necessary.

You cannot rename the current database, you must switch to another database before renaming the current one.

Switching bases may also require you to enter encryption keys.

:02	<b>?</b> 🔲	7:04	···· 🗢 🔲
Change DB		Rena	ame DB
Select from:		Sele	ect from:
✓ Select from:		✓ Select from	n:
default		default	
Confirm crypto key		V	
$\checkmark$ ×		Select BD and choos	e new name, then confirm

Choose DB, input keys, if needs, then confirm

#### Buttons picture: picture menu

- **Delete image files that are not referenced from databases,** integrity check (next page screen in the middle)

- Upload to the gallery / copy / share files with pictures that are no longer used in the database (next page right screen)

5:03		🗢 🔲			
Use biometric ID					
Auto	refresh image collection				
-   +	Photo not sorted				
-   +	Search result not sorted	ł			
-   +	Only pics description				
-   +	Show label everywhere				
-   +	2 view column(s)				
Slide show del	lay 2.0 sec				
Found:all: 3, a Found:query: Refresh image	le ok DBFile ok 7 in 0.006 sec added 3 7	闡			
DB:	Export unused				
Database i ver 0.5		menu			
Q Search Pho	Dtos DB Synonim	Setup			

# Checking image files and remove unnecessary (left)

You got a report about missing and unnecessary files, if you touch OK – unnecessary files will be removed. Strongly recommend save to iOS file manager unnecessary files, which may contain important pictures

Save unnecessary files in iOS File manager (right)

5:38			···· 🗢 🔲,
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	22 missing n 22 missing n		
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	Ok		
	Cancel		
•			

1:24		<b>? ()</b> ,
Auto	refresh when added	
-   +	Photo sorted by input	
-   +	Search result sorted by crea	ation date
-   +	Only pics description	
-   +	No label while play	
-   +	2 view column(s)	
Slide show del	ay 2.0 sec	
Images saved		
<b>4 Imag</b> 5.7 MB	ges	×
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Save 4 Im	ages	டு
Print		ē
Add to Sh	ared Album	ē
Add Tags		$\bigcirc$
		-

## Saving data base files

db – file with rules picsDB – file with pictures descriptions synDB – synonym facts

5:41			• ? <b>-</b>
	Use b	iometric ID	
	Auto i	refresh image collection	
-	+	Photo not sorted	
-	+	Search result not sorted	
-	+	Only pics description	
-	+	Show label everywhere	
-	+	2 view column(s)	
Slide she	ow dela	y 2.0 sec	
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Сору			¢
Add T	ags		$\bigcirc$
Save	to File	S	
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7:40		🗢 🔲
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#### **Test bases**

During the Base check, the rules are scanned for their match with other rules. Identified partial and complete matches of the rules should be reviewed for possible errors during search.

Rules and synonyms were marked with [qual], marked orange should be revied, because they can cause problem with future search: recursively loop.

Also, better not to use same word in different synonyms facts. It's better collect all synonyms in one fact, because application consider them as one rule, but separating you may imagine they have different lexical meaning.



## **Bases' examples**

#### **Rules base**

world: people, animals, area, time sadness: evening, sunset, violet countries: Germany, Ukraine, Russia, Belgium, Poland, Spain female: grand mother, grand daughter, girlfriend, girl, aunt, woman, daughter people: friend, male, female, stranger Kharkiv: Klochkovskaya, Shevchenko garden, Zhuravlevka, Saltovka Germany: Berlin Europe: Ukraine, EU river: river Kharkiv meal: baked potato water: spring, river, ocean, galf, sea, lake ocean: Indian ocean, Arctic ocean, Pacific ocean, Southern ocean, Atlantic ocean wild animals: lion, snake, puma Ukraine: Kharkiv, Lviv male: dad, grand father, son, boy, man, boyfriend, grand son, ancle hairdresser: wigs, barber health: relaxation, sleep, hospital, doctor, gym sea: Mediterranean Sea, Black Sea flowers: marigold flower, dandelion, hyacinths, wild rose, cornflower, yellow flower, narcissus flowers, cyclamen family: grand mother, dad, grand son, ancle, grand daughter, grand father, aunt, daughter, son rest: amusement, enjoyment, sleep, relaxation

#### Synonym's facts base

pets, pet boys, boy stranger, strangers men, man women, woman leo, lion kitty, cat time, schedule wild animal, wild animals human, people experience, affair, occurrence, events, phenomenon, incident, event, occasion, happening, episode, proceeding street dog, street dogs street animal, street animals marigold flower, marigold flowers narcissus flower, narcissus flowers holidays, holiday sunshine, sunny

Poland: Warsaw EU: Spain, Poland, Belgium, Germany Saltovka: Kompas Berlin: Alexander platz my home: Kharkiv happiness: holidays, sunny, morning pets: cat, dog area: air, water, ground, territory, countries Spain: Barcelona street animals: street cats, street dogs, dove event: war, holiday, work Christmas: Saint Nicholas, Christmas wreath holiday: playday, Christmas, parade, break time: night, morning, day, evening **Belgium: Antwerp** profession: doctor, barber, teacher, coach animals: wild animals, pets kitchen: cooker, oven, electric kettle, waffle oven romantic: rose petals

#### **Known problems**

1. For security reasons multiply sharing encrypted files not possible 2. Also, encrypted video sharing could be saved only into "Files" with random name without correct extension, needs manual rename (Sharing video with UIActivityViewController needs writing decrypted temporary files before transfer, so there is an possibility when some application can reach this decripted files in temp folder, so video transfers to UI control as Data and needs rename after transfer)

3. As variant, you can share encrypted database backups