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# INTELLECT MODELING KIT

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**Abstract.** The technology called Intellect Modeling was developed with idea of amplification of human intellect and as an alternative to traditional Artificial Intelligence. The goal is to assist human intellect on every step of its activity, accept human knowledge and develop new knowledge together with people. The activity of Intellect Modeling applications could be verified by human expert on every stage. Intellect Modeling Kit is an open-source project located at Sourceforge repository <http://sourceforge.net/projects/gkm-ekp>.

**Keywords:** intellect modeling, artificial intelligence, adaptive learning, just-in-time knowledge, general knowledge machine, electronic knowledge publishing

## 1 Introduction

Intellect Modeling Kit (IMK) is a system for assisting intellectual activity during the following steps:

### 1. Observation - getting data and information

The component `gkmforms.exe` creates specialized site accessible with Web browser for interaction with user

### 2. Producing propositions, based on the knowledge

The component `gkm2017b.exe` produces propositions based on user input and internal e-knowledge

### 3. Selection and verification of the most appropriate propositions

The specialized site for interaction with user created by component `gkmforms.exe` produces ranged propositions list with detailed explanations

### 4. Memorizing - converting data to information and new knowledge item creation

The component `soz2017b.exe` creates e-knowledge database containing human knowledge that could be used on step 1

### 5. Abstraction finding – building artificial objects representing group of real objects, featuring typical signs of group

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<sup>1</sup> <http://gkm-ekp.sf.net>

The component `abs2017b.exe` performs tasks as Data Mining, Big Data and Natural Cluster Analysis to find groups of similar objects and regularities they are based on

## **2 IMK Components and Interaction**

### **2.1 IMK Components**

IMK was developed as an alternative to traditional Artificial Intelligence. The goal is to assist human intellect on every step of its activity, accept human knowledge and develop new knowledge together with people. The activity of IMK could be verified by human expert on every stage.

IMK includes the following objects:

- `v2017b.zip` – sources of components `soz2017b.f`, `gkm2017b.f`, `abs2017b.f`, `gkmforms.bas`, `gkminter.php`, `settings`, `ini` and `dat` files, binaries for Windows and Linux, pictures and icons.
- `renais.zip` – sources for ELECTRONIC KNOWLEDGE SYSTEM ON RENAISSANCE PAINTING
- `gestures.zip` – sources for ELECTRONIC KNOWLEDGE SYSTEM ON LANGUAGE OF GESTURES
- `avitamin.zip` – sources for ELECTRONIC KNOWLEDGE SYSTEM ON AVITAMINOSIS
- `gfortran4.zip` – portable compiler of GNU Fortran v4.7 for Windows with IMK sources in `bin` directory
- `freebas.zip` – portable compiler of Free Basic v1.04 for Windows with IMK sources
- `geany.zip` – portable IDE for Windows for Fortran, Basic and PHP
- `kmeleon.zip` – portable browser for Windows K-Meleon
- `xampp.zip` – portable environment for Windows supporting Apache Web Server and PHP, including ready-to-use ELECTRONIC KNOWLEDGE SYSTEM ON TOXICOLOGY, ELECTRONIC KNOWLEDGE SYSTEM ON RENAISSANCE PAINTING, ELECTRONIC KNOWLEDGE SYSTEM ON LANGUAGE OF GESTURES, ELECTRONIC KNOWLEDGE SYSTEM ON AVITAMINOSIS

### **2.2 IMK Interaction**

The realization of IMK is based on idea of member of USSR Academy of Science M. N. Livanov that the essence of memory associations is a spatial-temporal coherence of narrow-band periodical oscillations of central neurons sets activity.

Upon information input the list of propositions based on etalons supplied ranged by value.

Proposition Value Index PVI for etalon =  $((\text{etalon refs signs weights sum})/(\text{object signs number}) + (\text{etalon refs signs number})/(\text{etalon signs number}))/2$ . Element of etalon description weight =  $1/(\text{number of etalons with this element/sign})$ .

The system assisting human expert's activity should comply with the following requirements described by Arthur Conan Doyle in Sherlock Holmes stories.

We would call it a knowledge machine.

#### **Step 1 - Observation**

1. A knowledge machine should have maximum possible information about a case before a judgment.

#### **Step 2 - Producing propositions, based on knowledge**

2. A knowledge machine should possess maximum possible knowledge in a sphere of implementation.

3. A knowledge machine should possess no excessive knowledge, should have nothing but the tools which may help in doing work.

4. Getting indication of the course of events, a knowledge machine should be able to guide itself by other similar cases which occur to its memory.

5. A knowledge machine should have an ability to take into account not only descriptions of situations in its memory but results as well, providing a possibility to reconstruct a description from a result, i.e. if you told it a result, it would be able to evolve what the steps were which led up to that result.

6. Possessing information about the great number of cases, a knowledge machine should have an ability to find a strong family resemblance about them, i.e. to find templates of typical cases.

7. A knowledge machine should have an ability to explain the grounds of its conclusion.

8. A knowledge machine should arrive at the conclusion for a few seconds after getting a description of case.

9. A knowledge machine should focus on the most unusual in descriptions of situations.

#### **Step 3 - Elimination of impossible propositions**

10. A knowledge machine should have an ability to point out all impossible propositions.

#### **Step 4 - Selection and verification of the most appropriate propositions**

11. A knowledge machine should estimate a level of a confidence of its propositions.

The technologies of AI as expert systems and neural networks don't comply with these requirements. And it is a reason why human-AI interaction is complicated at the time. People hardly can trust AI propositions.

Expert system is based on the idea of decision tree, when, with every answer to a program's question, a direction of moving through a tree changes until a final leaf (decision) will be reached.

- So not all possible questions will be asked, and not maximum information will be received.
- The key elements are decision rules, but no knowledge itself. Not a word about the thousands of other similar cases, about typical cases.
- As we see, expert systems originally were designed to be deduction machines. But it is not very reliable to entrust to machine deciding what is absolutely impossible. We think that more fruitful approach is to show what reasons to consider some hypotheses as impossible. And only man should make the final decision.

Neural network is based, as we know, on the idea of teaching of set of elements (neurons), controlling conductivity between them.

- A neural network cannot explain reasons of own conclusion in terms that people can understand. So it is very hard to verify its activity and, therefore, to believe.

An expert system is an example of a 'top-down' approach when particular instances of intelligent behavior selected and an attempt to design machines that can replicate that behavior was made. A neural network is an example of 'bottom-up' approach when there is an attempt to study the biological mechanisms that underlie human intelligence and to build machines, which work on similar principles.

IMK technology complies with all 11 requirements and unites 'top-down' and 'bottom-up' approaches. Any human knowledge written and spoken can be uploaded to IMK in a straight way by any expert not familiar with software coding. The IMK components are designed to create ready-to-use software application using simple text files edited by people. IMK assists intellectual activity, but does not replace people.

### 2.3 Building IMK Application

It is needed to prepare knowledge to be processed in a special human-like way.

#### Step I

You should name the project usually using up to 8 symbols suitable for file name (for example, Renaissance Painting System may be named `renais`). Create a directory where system will reside, for example, `d:\renais`. Copy there the development software `soz2017b.exe`.

Preliminarily, it is needed to remove from initial text all excessive information, keeping titles, exact descriptions of situations and recommendations. Please try to concentrate on ideas rather than on words. We propose to define 'idea' as a standard text directly defining a specific side of a situation. You should control appearance of synonymous ideas, carefully removing duplications. Resulting text, which may be used as example, in a case of painting information, is the following.

1. Hieronimus Bosch (Van Aken), 1450-1516, Netherlands

-----  
Facial expressions are childishly naive

...

Every idea in a description of situation we call a sign. In principle, any sign can have a grade, for example, if a sign is 'Weight' it may have grades '1-Very low, 2-Low, 3-Mean, 4-High, 5-Very high'. But in existing human texts all signs have as a rule only one grade. It is very rare need to use sign with several grades.

### **Step II**

You should gather all signs from all descriptions of situations, eliminate duplicates, and number them pointing number of possible grades. You should make a file called, for example, renaiss.sgn of the following type.

```
1. Artist is pessimist (Sign's title up to 64 symbols)
1, (Number of sign's grades)
```

...

and so on.

### **Step III**

You should make a file called, for example, renaiss.stn, containing numbered titles of possible situations with numbers of corresponding signs and grades, where zero means end of list. If sign's grade is 1 than you may just place one more comma. It should look like the following.

```
1. Hieronimus Bosch (Van Aken), 1450-1516, Netherlands
1,,2,,3,,4,,5,,6,,7,,8,,9,,10,,11,,12,,13,,14,,15,,16,,
17,,18,,19,,115,,
```

0,,

```
2. Hieronimus Bosch, after 1500, Netherlands
```

```
20,,21,,22,,23,,24,,25,,26,,
```

0,,

```
3. Drawing by Hieronimus Bosch, 1450-1516, Netherlands
```

```
27,,28,,29,,30,,31,,
```

0,,

...

and so on.

### **Step IV**

You should make a file containing a questionnaire for a convenient description of a problem. In this questionnaire you should group questions regardless of its numbers. It is allowed to include additional explanations, if needed. Format of chapter's title is '= Title', format of sign's number is 'NNNN~' (for example ' 11~') and format of sign's grade is 'NN~'. You should make a file called, for this example, renaiss.que of the following type.

```
== INDEPENDENT VERIFICATION PROJECT - CONSULTING POINT
ON PAINTING
```

```
General Knowledge Machine Research Group
```

```
(c) Copyright Konstantin M. Golubev 2017. All rights
reserved.
```

```
Web site: http://gkm-ekp.sf.net, email: gkm-
ekp@users.sf.net
```

<em>Ideas source: Renaissance painting from Breughel to El Greco,

Text by Lionello Venturi, Translated by Stuart Gilbert,  
(c) 1979 by Editions d'Art Albert Skira S.A., Geneva,  
ISBN 0 333 26644 7

</em>

<hr>

DISCLAIMER WARNING!

This kind of system is intended to assist in paintings evaluation.

It shouldn't in no way replace qualified expert!

== PICTURE'S GENRE =====

3~Picture is in tradition of illuminators

7~Allegories with a moral purpose

55~Painting nature and daily life without celestial or diabolic interventions

230~Landscape, ingeniously diversified with genre scenes

...

and so on.

#### Step V

You should make a file containing all propositions regarding identified situations. You should call it renais.prp and it should look like the following.

The first line of proposition is a title of situation from file renais.stn preceding by '~' sign. After this proposition text goes. Please note that for Internet version of e-knowledge system you may include any HTML tags into proposition text (references to pictures, multimedia, URL and so on).

~ 1. Hieronimus Bosch (Van Aken), 1450-1516, Netherlands

-----  
Artist is pessimist

Artist saw not enough God presence in man

Picture is in tradition of illuminators

Painter is wholly medieval

Fish, pigs, all kind of animals assume human-like forms

Great number of small figures

Allegories with a moral purpose

Savage irony, which gives a piquancy

Scene look like a puppet play

Facial expressions are childishly naive

Artist was incapable of dramatic effects

Stressing everywhere the conflict between good and evil

A picture presents itself as a sequence in time

Lightness of touch  
Airy freedom  
Exquisitely lovely figures dad in the most delicate  
of colors  
Color-light synthesis  
Tonal unity of the composition as a whole  
Deep religious sensibility  
Exceptionally fertile imagination  
THE FOLLOWING IS DETAIL OF PICTURE "THE HAY WAGON",  
PRADO, MADRID  
<IMG src="bosch.jpg">

...

### Step VI

You should make a file called `soz2017b.ini` of the following format:

Title of e-knowledge system  
Signs descriptions file name (.sgn)  
Situations descriptions file name (.stn)  
Propositions file name (.prp)

For example, in our system:

Electronic Knowledge System on Renaissance Painting  
`renais.sgn`  
`renais.stn`  
`renais.prp`

Please run command interpreter. Change directory to that appointed for development. All previously created files must be placed in this directory. After that run the program `soz2017b.exe`. On completion view the file `proto.soz`. If it does not contain errors messages than initial e-knowledge base creation (files \*.gkm) was successful. If there are errors please edit your files.

Initial sources have limitations: up to 2,000 possible signs, up to 8,000 possible situations (etalons), up to 100 signs in problem description, up to 100 signs in situation (etalon) description, up to 1,000 size of e-knowledge base element. It is sufficient to build very large e-knowledge system. But if it is necessary to build greater system, you should edit file `all2017b.set` and recompile sources.

Ready-to-use application development by component `gkmforms.exe`

Please run command interpreter. Change directory to that appointed for development. All previously created files must be placed in this directory. After that run the program `gkmforms.exe`.

Answer the name of project to question Title, for example, `renais`.

On completion view the file `index.php` that's a homepage for application like the following.

```
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 4 //EN">
<html>
<head>
<META NAME = "description" CONTENT = "INDEPENDENT
VERIFICATION PROJECT - CONSULTING POINT ON PAINTING">
```



```

<META NAME = "author" CONTENT = "Member of the GKM Re-
search Group, http://gkm-ekp.sf.net">
<META NAME = "keywords" CONTENT = "General Knowledge
Machine, Online, Electronic Knowledge Publishing, Intel-
ligent Web Site, Intellect Modeling Kit, GKM Research
Group, Electronic Knowledge System">
<META HTTP-EQUIV="content-type" CONTENT="text/html;
charset=windows-1252">
<title>INDEPENDENT VERIFICATION PROJECT - CONSULTING
POINT ON PAINTING</title>
</head>
<body bgcolor="#383853" link="#0000FF" VLINK="#0000ff"
ALINK="#0000ff">
<a Name=YK><FORM ACTION="gkminter.php" METHOD=POST tar-
get='gkminterhtml' NAME=gkmzf onSubmit='return
ANSWER();'>
<table bgcolor="#FFFFFF" border=3
bordercolordark="#000001" cellpadding=1 cellspacing=0>
<TR><TD align=left></a><STRONG>E-KNOWLEDGE
SYSTEM</STRONG></TD><TD align=right>Powered by General
Knowledge Machine<A HREF=http://gkm-ekp.sf.net><IMG
SRC=gkmlogo.gif ALT='GKM Research Group Home' HSPACE=11
WIDTH=100 HEIGHT=53 ALIGN=TOP BORDER=0></A><IMG
SRC=wgbhuser.gif ALT='Web Access Symbol (for people with
disabilities)' ALIGN=TOP BORDER=0></TD>
</TR><TR><TD><IMG SRC=Holmes.jpg alt='Mr Sherlock
Holmes' align=left border=1></TD><TD>
<EM><b>Disclaimer warning! This system is not a re-
placement of qualified expert.<br>Authors should not be
liable for any results of its implementation.<br>In every
specific case only authorized person should make deci-
sions.</b></em><hr><br>
<B>INDEPENDENT VERIFICATION PROJECT - CONSULTING POINT
ON PAINTING</B><br>
<br><INPUT NAME=Y1 TYPE=TEXT VALUE='Input here non-
standard info like name, title ...' SIZE=54><br><br>
<b>Please check all signs describing problem among
listed below and press (Advise).<br>Don't block pop-up
window containing advice!&nbsp;Press (Clear) to reset be-
fore next try.&nbsp;</b><br>
<br>Set higher Max. Prop. Num. if you need more re-
sults. &nbsp;</b><br>
<BR><SELECT NAME="SPISOK" SIZE="1" OnChange="SPISOKY()"
LANGUAGE="JAVASCRIPT">
<OPTION VALUE=1> INDEX OF CONTENTS

```

<OPTION VALUE=2>INDEPENDENT VERIFICATION PROJECT -  
CONSULTING POINT ON PAINTING  
<OPTION VALUE=3>PICTURE'S GENRE  
<OPTION VALUE=4>PORTRAITS  
<OPTION VALUE=5>HUMAN FIGURES  
<OPTION VALUE=6>FIGURES  
<OPTION VALUE=7>COLORS  
<OPTION VALUE=8>LIGHT

...

On completion the files renaissnn.html and index.php appear containing knowledge texts. For example:

renais.html renaiss1.html ... renaiss31.html gkminter.php  
index.php

You should create directory for application in htdocs directory of Apache Web server like d:\xampp\htdocs\renais. After that copy to it files \*.gkm, \*.html, \*.php, \*.pdf, gkm2017b.exe, gkm2017b.ini, and files from images directory. The address is http://localhost:8000/renais. The following is files list of ELECTRONIC KNOWLEDGE SYSTEM ON RENAISSANCE PAINTING (renais).

d:\xampp\htdocs\renais  
boe.gkm db.gkm db2.gkm renaiss.html renaiss1.html...  
renais31.html gkm-n gkm2017b.exe gkm2017b.ini gkmhelp.pdf  
gkminter.php gkmlogo.gif Holmes.jpg ie.gkm index.php  
ip.gkm oe.gkm seboe.gkm sip.gkm soe.gkm we.gkm  
wgbhuser.gif

Ready-to-use applications provided

IMK includes the following application ready-to-use.

- ELECTRONIC KNOWLEDGE SYSTEM ON TOXICOLOGY  
(emergmed)
- ELECTRONIC KNOWLEDGE SYSTEM ON RENAISSANCE PAINTING  
(renais)
- ELECTRONIC KNOWLEDGE SYSTEM ON LANGUAGE OF  
GESTURES (gestures)
- ELECTRONIC KNOWLEDGE SYSTEM ON AVITAMINOSIS  
(avitamin)

They are located in the htdocs directory of xampp – portable environment for Windows supporting Apache Web server and PHP.

To install applications file xampp.zip should be unzipped into the root directory of partition, for example d:\xampp. The applications should be located in the following subdirectories of d:\xampp\htdocs - d:\xampp\htdocs\emergmed, d:\xampp\htdocs\renais, d:\xampp\htdocs\gestures and d:\xampp\htdocs\avitamin. Start Apache Web Server with command d:\xampp\apache\_start.bat. A text window appears notifying about server start. Server shutdown is by closing a window.

The browser K-Meleon could be used for accessing applications. To install browser file kmeleon.zip should be unzipped into suitable directory, for example, d:\K-MeleonPortable. Start browser with command d:\K-MeleonPortable\K-MeleonPortable.exe. The initial page pointing to presented applications appears, for example, <http://localhost:8000>.

## 2.4 Natural Cluster Analysis

Have you ever tried to understand is there any sense in a significant amount of data? Did you use heavy mathematics to classify objects? Was it easy and convenient?

Have you been satisfied with results?

Amazingly, but human experts can do such a job without any mathematics. We call such persons experienced. They know not only facts but can explain relations between facts, set general cases and rules for their treatment.

Can we develop mathematics to simulate this?

Let us try to solve the following problem with theoretical mathematics. We have 1000 cases with every case described by subset of parameters from a whole set of parameters with total number 1000. We want to find typical cases dividing all number of cases into groups of similar ones.

How we can do this?

We can place all cases into the database and try to query database with all possible subsets of parameters. This way we hope to find typical combinations of parameters and corresponding groups of cases.

What computing power we will need?

The most powerful supercomputer in the world of 2016 Tianhe-2 (54 PFLOPS) has the power of  $6 \cdot 10^{16}$  FLOPS (Floating point operations per second). It is equal approximately to  $2^{50}$  FLOPS. Assume that we can do one query per one FLOP. In reality it takes much more. Total number of queries should be  $2^{1000}$ . The time needed is  $(2^{1000})/(2^{50})=2^{950}$ , i.e.  $10^{300}$  seconds. This number is really greater than number of seconds in universe existence, i.e.  $4.32 \cdot 10^{17}$ .

But could we simulate human tactics?

The brain contains near 100 billion neurons, every one of them is a computer. They are working together in an organized way and it is impossible at the moment to build such a complex structure.

Is situation hopeless?

The brain is multi-floor building and what we know about intellect is higher floor expressed by words. Fortunately, number of verbal concepts and ideas used by people are limited and can be replicated by our computers.

How?

If we could model intellectual activity based on verbal ideas, then we would have a chance to simulate human experience.

The central point of this is ability of human brain to find similar objects descriptions inside memory. The brain can do it almost instantly.

The IMK technology may be used to simulate this activity. With this technology it is possible to model expert evaluation of situation based on human knowledge doing

grouping/categorization. Every object from set should belong to at least one group. And all objects in group should be similar.

We can start the following procedure. With General Knowledge Machine we try to find for every object sets of similar objects in a chosen range of similarity limits and compute signs typical for thus found groups with a given frequency of occurrence. After that we build groups of objects containing all or almost all found signs. This way we have number of compound iterations equal to a number of initial objects. And the time needed is moderate, usually hours.

It is possible that not all groups can be found this way but many of them could. And we have a possibility to set some signs as obligatory that provides very convenient thing. For example, we can set as obligatory signs treatment and result for a number of patients. And then we could see groups of typical patients having predefined treatment and result.

You should make a file called `abs2017b.ini` of the following format:

```
Title of e-knowledge system
Grades Dispersion Limit (%) [Start, Finish, Step]
(PVI) Similarity Limit [Start, Finish, Step]
(% Of Etalons) Regularity Signs Selection Limit
(%) [Start, Finish, Step]
(Att. Ind. % of Signs) Group Selection Limit [Number]
(% of Objects in Group) Typical Signs Limit [Number]
Group Objects Number Lower Limit (%) [Number]
Obligatory Signs. Up to 10 [Number]
```

For example, in our system:

```
Renaiss
0,0,0,
1,98,1,
1,98,1,
80,
85,
5,
0
```

Please run command interpreter. Change directory to that appointed for development. All previously created files must be placed in this directory. After that run the program `abs2017b.exe`.

Answer the name of project to question Title, for example, `renais`. Input values into appropriate fields.

On completion view the file `proto.abs`.

```
You can look at variant of proto.abs in sources for Painting.
Intellect Modeling Kit v.2017beta regularities finding
Copyright (C) 1987-2017 Konstantin M. Golubev
Web site http://gkm-ekp.sf.net, Email gkm-ekp@users.sf.net
```

Distributed under Lesser GNU General Public License

Snum: 2000 Enum: 8000 Emax:100 Imax:100 Base: 1000 Sn:  
80 En: 80

Renais

Regularities Finding

-----

\*\*\*\*\* Signs Probabilities \*\*\*\*\*

Total Number of Etalons 31

3. % 1)1. Artist is pessimist

3. % 2)2. Artist saw not enough God presence in  
man

3. % 3)3. Picture is in tradition of illuminators

...

\*\*\*\* Regularity derived from the object:

18.18. Jacomo Pontormo (Carrucci), 1494-1556/57, Tus-  
cany, Italy

204 - 1)204. Mannerist

226 - 1)226. Elongation of proportions

231 - 1)231. Anti-classical composition

Group members

23.23. Niccolo dell'Abbate, 1509-1571, Modena, Italy

30.30. El Greco (Domenikos Theotokopulos), 1541-1614,  
Italy, Spain

Total 2 of 31 ( 6.45 +- 8.65 % )

\*\*\*\* Regularity derived from the object:

18.18. Jacomo Pontormo (Carrucci), 1494-1556/57, Tus-  
cany, Italy

204 - 1)204. Mannerist

226 - 1)226. Elongation of proportions

Group members

22.22. Francesco Parmigianino (Mazzda), 1503-1540,  
Parma, Italy

23.23. Niccolo dell'Abbate, 1509-1571, Modena, Italy

30.30. El Greco (Domenikos Theotokopulos), 1541-1614,  
Italy, Spain

Total 3 of 31 ( 9.68 +- 10.41 % )

\*\*\*\* Regularity derived from the object:

19.19. Rosso Fiorentino (Giovanni Battista), 1495-1540, Florence

204 - 1)204. Mannerist

Group members

18.18. Jacomo Pontormo (Carrucci), 1494-1556/57, Tuscany, Italy

19.19. Rosso Fiorentino (Giovanni Battista), 1495-1540, Florence

20.20. Domenico Beccafumi, 1486-1551, Montaperti, Italy

21.21. Agnolo Bronzino (di Cosimo), 1503-1572, Florence, Italy

22.22. Francesco Parmigianino (Mazzda), 1503-1540, Parma, Italy

23.23. Niccolo dell'Abbate, 1509-1571, Modena, Italy

28.28. Bartholomeus Spranger, 1546-1611, Netherlands

29.29. Pieter Aertsen, 1508-1575, Netherlands

30.30. El Greco (Domenikos Theotokopulos), 1541-1614, Italy, Spain

Total 9 of 31 ( 29.03 +- 15.98 % )

\*\*\*\* Regularity derived from the object:

15.15. Tintoretto (Jacopo Robusti), 1518-1594, Venetia

115 - 1)115. Exceptionally fertile imagination

Group members

1. 1. Hieronimus Bosch (Van Aken), 1450-1516, Netherlands

15.15. Tintoretto (Jacopo Robusti), 1518-1594, Venetia

19.19. Rosso Fiorentino (Giovanni Battista), 1495-1540, Florence

Total 3 of 31 ( 9.68 +- 10.41 % )

\*\*\*\* Regularity derived from the object:

4. 4. Quentin Massys, 1466-1530, Netherlands

39 - 1)39. Total serenity

40 - 1)40. Depicting man and nature with loving care in details

41 - 1)41. Color are conditioned by the images, not autonomous

Group members

4. 4. Quentin Massys, 1466-1530, Netherlands  
5. 5. Eyckian tradition, Netherlands  
Total 2 of 31 ( 6.45 +- 8.65 % )

\*\*\*\* Regularity derived from the object:

7. 7. Pieter Brueghel, 1525/30-1569, Netherlands

13 - 1)13. A picture presents itself as a sequence in time

Group members

1. 1. Hieronimus Bosch (Van Aken), 1450-1516, Netherlands  
7. 7. Pieter Brueghel, 1525/30-1569, Netherlands  
Total 2 of 31 ( 6.45 +- 8.65 % )

\*\*\*\* Regularity derived from the object:

24.24. Francois Clouet, before 1522-1572, France

233 - 1)233. Attention to details

Group members

24.24. Francois Clouet, before 1522-1572, France  
27.27. Antonio Moro, 1519-1576, Netherlands  
Total 2 of 31 ( 6.45 +- 8.65 % )

\*\*\*\*\* GROUPS FOUND \*\*\*\*\*

## 2.5 Software Compilation

IMK supplied with sources and binaries for Windows and Linux. Portable Windows GNU Fortran gfortran4.zip and Free Basic compilers freebas.zip are included. Universal Windows IDE GEANY is included in geany.zip.

In order to compile for your system e-knowledge base engine provide that GNU compiler is on your system (visit <http://www.gnu.org>). Unzip, for example, GNU Fortran compiler to directory d:\gfortran4, Free Basic compiler to directory d:\FreeBASIC-1.04.0-win32.

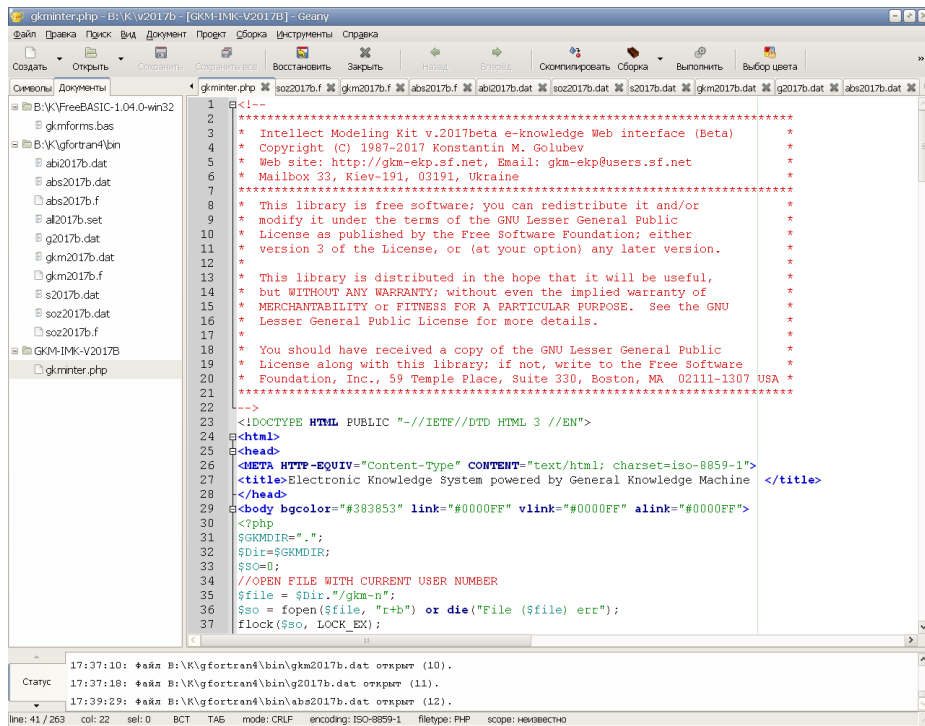
Unzip Fortran sources \*.f, \*.dat, \*.set to selected directory with compiler binary like d:\gfortran4\bin. Change directory to chosen one. Issue commands:

```
gfortran soz2017b.f -o soz2017b.exe
```

```
gfortran gkm2017b.f -o gkm2017b.exe
gfortran abs2017b.f -o abs2017b.exe
```

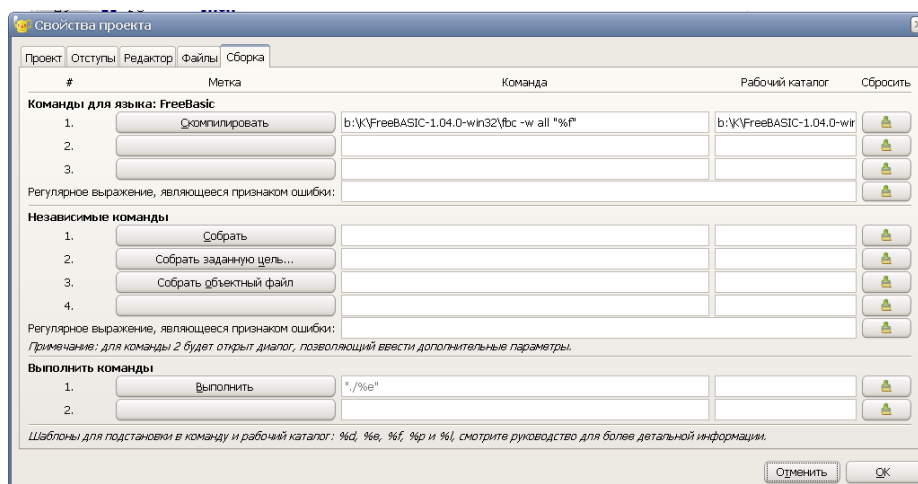
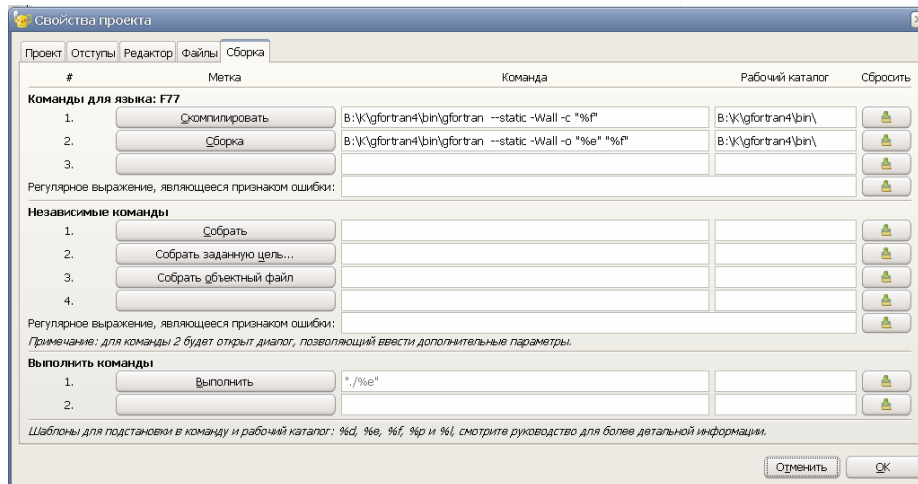
Unzip Free Basic sources \*.bas to selected directory with compiler binary like d:\FreeBASIC-1.04.0-win32. Change directory to chosen one. Issue command:

```
fbc -w all gkmforms.bas
```



```
gkminter.php - B:\K\V2017b - [GKM-IMK-V2017B] - Geany
Файл  Правка  Поиск  Вид  Документ  Проект  Сборка  Инструменты  Справка
Создать  Открыть  Сохранить  Сохранить как...  Восстановить  Закрыть  Наласт  Вывод  Очистить/сбросить  Сборка  Выполнить  Выбор цвета
Символы  Документы
B:\K\FreeBASIC-1.04.0-win32
  gkmforms.bas
  B:\K\gfortran4\bin
    abs2017b.dat
    abs2017b.f
    all2017b.set
    g2017b.dat
    gkm2017b.dat
    gkm2017b.f
    s2017b.dat
    soz2017b.dat
    soz2017b.f
  GKM-IMK-V2017B
    gkminter.php
1  <!--
2  *
3  * Intellect Modeling Kit v.2017beta e-knowledge Web interface (Beta)
4  * Copyright (C) 1987-2017 Konstantin M. Golubev
5  * Web site: http://gkm-ekp.sf.net, Email: gkm-ekp@users.sf.net
6  * Mailbox 33, Kiev-191, 03191, Ukraine
7  *
8  * This library is free software; you can redistribute it and/or
9  * modify it under the terms of the GNU Lesser General Public
10 * License as published by the Free Software Foundation; either
11 * version 3 of the License, or (at your option) any later version.
12 *
13 * This library is distributed in the hope that it will be useful,
14 * but WITHOUT ANY WARRANTY; without even the implied warranty of
15 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
16 * Lesser General Public License for more details.
17 *
18 * You should have received a copy of the GNU Lesser General Public
19 * License along with this library; if not, write to the Free Software
20 * Foundation, Inc., 59 Temple Place, Suite 330, Boston, MA 02111-1307 USA
21 *
22 *->
23 <!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 3 //EN">
24 <html>
25 <head>
26 <META HTTP-EQUIV="Content-Type" CONTENT="text/html; charset=iso-8859-1">
27 <title>Electronic Knowledge System powered by General Knowledge Machine </title>
28 </head>
29 <body bgcolor="#383853" link="#0000FF" vlink="#0000FF" alink="#0000FF">
30 <?php
31 $GKMDIR=".";
32 $Dir=$GKMDIR;
33 $So=0;
34 //OPEN FILE WITH CURRENT USER NUMBER
35 $file = $Dir."/gkm-n";
36 $so = fopen($file, "r+b") or die("File ($file) ert");
37 flock($so, LOCK_EX);
38
Статус
17:37:10: Файл B:\K\gfortran4\bin\gkm2017b.dat открыт (10).
17:37:18: Файл B:\K\gfortran4\bin\g2017b.dat открыт (11).
17:39:29: Файл B:\K\gfortran4\bin\abs2017b.dat открыт (12).
line: 41 / 263 col: 22 sel: 0 BCT TAB mode: CRLF encoding: ISO-8859-1 filetype: PHP score: неизвестно
```





## 2.6 Results

Early versions of General Knowledge Machine were developed for UNIX, MS-DOS, Windows operating systems. The latest version supports all platforms of GNU compiler options (any Windows, Linux, UNIX ...).

There are working products which can be presented to experts in corresponding areas.

Products were tested in various environments – business, medicine, arts. Papers were published in Russia, Italy and UK. The work was featured in the 2006-2007 Edition of the Marquis Who's Who in Science and Engineering as a pioneer research.

### 3 Conclusion and Perspectives

Some people say about a crisis of crisis of human intellect? Of course, not. May be it's a crisis of human self-confidence. In the beginning there were many promises to built machines more intelligent than people. And those machines should use advanced principles of work, much better than obsolete human intellect [5]. Instead of help to human intellect there were attempts to replace it. But those, who read works of academician V. Vernadsky from Ukraine [6], E. Le Roy [7] and P. Teilhard de Chardin from France [8], know that the main result of evolution on Earth is creation of Noosphere - a sphere of intellect. And, in this case, it is very interesting what can be called an intellect, but is based on other principles than developed by evolution?

#### References

1. J.L.Alty and M.J.Coombs. Expert systems. Concepts and examples. The National Computing Centre Limited (1984)
2. Geoffrey E. Hinton. Learning in parallel networks. Byte. By McGraw-Hill, Inc., New York (1985)
3. M. N. Livanov. Spatial Organization of Cerebral Processes. John Wiley & Sons: Chichester (1977)
4. K. M. Golubev. Adaptive learning with e-knowledge systems. Inderscience Enterprises Limited, UK, in IJTM, Vol. 25, Nos.6/7 (2003)
5. K.M. Golubev: Traditional + Adaptive learning = broad way to knowledge, ISPIM,(1999) [http://www.ispim.org/files/ISPIM\\_1999\\_Conference\\_Programme.pdf](http://www.ispim.org/files/ISPIM_1999_Conference_Programme.pdf)
6. Roger Schank, Larry Hunter. The quest to understand thinking. Byte. By McGraw-Hill, Inc., New York (1985)
7. Vladimir I. Vernadsky. The Biosphere. tr. David B. Langmuir, ed. Mark A. S. McMenamin, New York, Copernicus (1998)
8. E. Le Roy. Les origines humaines et l'evolution de l'intelligence. Paris (1928)
9. P. Teilhard de Chardin. La place de l'homme dans la nature. Éditions du Seuil, Paris (1956)
10. Google blog posted by Marina Tarasova, Communications Associate, Ukraine, <http://googleblog.blogspot.com/2011/12/remembering-remarkable-soviet-computing.html>
11. Development of Computer science and technologies in Ukraine, International Charity Foundation for History and Development of Computer Science and Technique ICFCST, [http://www.icfcst.kiev.ua/MUSEUM/LEBEDEV/L\\_life.html](http://www.icfcst.kiev.ua/MUSEUM/LEBEDEV/L_life.html)
12. Development of Computer science and technologies in Ukraine, International Charity Foundation for History and Development of Computer Science and Technique ICFCST, [http://www.icfcst.kiev.ua/MUSEUM/GL\\_HALL2/1f5\\_9.html#1f5\\_9-1](http://www.icfcst.kiev.ua/MUSEUM/GL_HALL2/1f5_9.html#1f5_9-1)
13. Development of Computer science and technologies in Ukraine, International Charity Foundation for History and Development of Computer Science and Technique ICFCST, <http://www.icfcst.kiev.ua/MUSEUM/Amosov.html>
14. I. Ezhkova. Universal Scales to Systems of Communicating Contextual Systems,, <http://posp.raai.org/data/posp2005/Ezhkova/ezhkova.html>
15. V. N. Dumenko. The phenomenon of spatial synchronization of the brain potentials in a broad frequency band 1-250 Hz, <http://lib.bioinfo.pl/paper:18064890>

16. V. K. Oshe. A role of operative memory in solving of tasks of visual interpolation of linear intervals. In book "Psychophysiological regularities of perception and memory". Nauka, Moscow, Russia, (1985)
17. Renaissance painting from Breughel to El Greco. Text by Lionello Venturi, Translated by Stuart Gilbert. Editions d'Art Albert Skira S.A., Geneva, 1979
18. Sir Arthur Conan Doyle. The Penguin Complete Sherlock Holmes. With a preface of Christopher Morley. Penguin Books, 1981,