Computer Science and Information Processing exam

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Surname \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Number:\_\_\_\_\_\_\_   
**(write them now!!!)**

You have only one paper. No questions are allowed, if you have doubts fell free to write them on this paper.  
You have 45 minutes starting from now.

## Exercise Relational databases

Draw the architecture of this database, using at least (more if necessary): 3 tables, a junction table, 5 fields per table. Try to make the database as complete as possible, keeping it simple and not contorted. You must indicate very clearly field names, field types (numeric, text, memo, date, yes/no), primary keys, relations with their “1” and “many” sides and the fields involved in the relations, required fields. For all the fields whose name is not obvious, you must also include a small comment that lets everybody understand what the field should contain. You must also justify non standard choices.  
Moreover, suggest a new query which involves at least two tables and suggest another new query which needs a summary query to be implemented.

**Research Institute**: this temporal database is designed to keep record of all the research projects conducted by a research institute with the involved researchers. Each researcher belongs to a research unit, which has a specific goal and a location in the buildings, and is involved in several project for a different amount of months. Each project is characterized by a research area, duration, funding. The database should be able to answer the question “How many researchers of the Theoretical Physics unit have been involved in projects funded by the European Union?”

## Exercise Theoretical questions

For each sentence, check either the TRUE or the FALSE box.

**~~This device acts as an input (or input-output) device:~~**

~~TRUE  FALSE  speakers  
TRUE  FALSE  keyboard  
TRUE  FALSE  printer  
TRUE  FALSE  multifunction printer with fax~~

**If you need to store 300 GB of data on a single device, you can store them:**TRUE  FALSE  on the internal hard disk of a modern computer  
TRUE  FALSE  on a modern external hard disk  
TRUE  FALSE  on a DVD

TRUE  FALSE  on a rewritable DVD  
TRUE  FALSE  on a blu-ray

TRUE  FALSE  on a modern USB pendrive

**Open source software**

TRUE  FALSE  can be always modified without asking for permissions

TRUE  FALSE  its original source code is freely available

TRUE  FALSE  may be shareware

TRUE  FALSE  may be commercial

**If you know the absolute path of a file**

TRUE  FALSE  you know in which directory it is contained

TRUE  FALSE  you know its size

TRUE  FALSE  you know its extension

TRUE  FALSE  you know in which disk or device it is physically stored

**This file is an image:**TRUE  FALSE  img .bat

TRUE  FALSE  MyPictures.zip

TRUE  FALSE  vacation.bmp  
TRUE  FALSE  album.mp3

TRUE  FALSE  webalbum.html

**~~This device acts as a server (or as a server and a client):~~**

~~TRUE  FALSE  network hard disk  
TRUE  FALSE  network printer~~

~~TRUE  FALSE  VoIP telephone~~

~~TRUE  FALSE  Outlook program~~

**You have 1 minute of time and a GigaEthernet connection. You can transfer:**

TRUE  FALSE  5000 **Kilo**bytes

TRUE  FALSE  5 **K**B

TRUE  FALSE  50 **M**B

TRUE  FALSE  500 **Giga**bytes

TRUE  FALSE  5 **G**B

**~~This is a protocol used for emails:~~**~~TRUE  FALSE  POP3  
TRUE  FALSE  HTTP   
TRUE  FALSE  DNS   
TRUE  FALSE  IMAP~~  
**VoIP telephone calls are usually much cheaper than standard telephone calls when calling:**

TRUE  FALSE  a local home telephone

TRUE  FALSE  a local mobile telephone

TRUE  FALSE  a home telephone in another country

TRUE  FALSE  another VoIP telephone with the same system in the same country

TRUE  FALSE  another VoIP telephone with the same system in another country

**A digital signature:**

TRUE  FALSE  guarantees the author’s identity

TRUE  FALSE  guarantees that the document’s content has not been altered

TRUE  FALSE  must be certified by a certification authority

TRUE  FALSE  can be used together with PEC

TRUE  FALSE  needs a scanner to be applied to documents

**A good and safe password**

TRUE  FALSE  must be changed every 7 days

TRUE  FALSE  can be d8Jhhn!je6t

TRUE  FALSE  can be 10061983

TRUE  FALSE  can be used in all websites’ registrations