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Designing Intelligent Technology Applications using the Visual Basic Files

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Abstract- This paper proposes an overview of the approach to design management computer applications using advanced programming languages and having the Visual Basic demonstration as support, which is one of the most popular object-oriented programming languages, in the area of programmer training. After a brief introduction to the Visual Basic syntax instructions for working with files, the description of how to build applications out of school activities for students - application that is set up as an illustration of features offered by the Visual Basic in working with collections of independent data - the files.

Key-Terms: *file, open, close, sequential, random, binary, line input, print, get, put.*

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Designing Intelligent Technology Applications using the Visual Basic Files

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Abstract- This paper proposes an overview of the approach to design management computer applications using advanced programming languages and having the Visual Basic demonstration as support, which is one of the most popular object-oriented programming languages, in the area of programmer training. After a brief introduction to the Visual Basic syntax instructions for working with files, the description of how to build applications out of school activities for students - application that is set up as an illustration of features offered by the Visual Basic in working with collections of independent data - the files.

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I. Introduction

Computer programming for the development of management applications can be achieved through advanced programming languages, the most widely currently used being the object oriented ones. One of the most recommended in this category, especially in terms of teaching is Visual Basic. If we relate to computer management applications, the huge amount of data they manipulate leads to the necessity of working with collections of data, especially files, usually regarded as independent, their relationship being done just by the help of the computer programs that exploit them.

Visual Basic has several peculiarities in the use of data files, which is why we approached the present study, providing the following aspects to the reader: the concept of files in Visual Basic, general self-documenting format of instructions that allow translation into programming language operations with files and obviously the needed illustration. For the latter approach we chose an example that has a strong teaching purpose, the problem solved being intentionally simplified by proposing a Visual Basic project.

We describe the operations in detail, for the programmer to enable any reader, that has minimal knowledge of programming in Visual Basic, to achieve the proposed project on their own, including the completion of its functions with code-programs, that are missing from the material.

The material is on the one hand, a systematization of knowledge that is necessary for the development of projects using Visual Basic files and, on the other hand, the setting out of the proper conditions for training the programming skills in this area, even for amateur or novice programmers.

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II. Review of the Paper on the Subject Matter

The specialized literature in programming in Visual Basic is very generous lately. The current trend in the development of documentation for help in programmer training is to provide the computer user, willing to make a major step towards becoming a programmer, a self-documented documentation and accompanied, on each major section, by examples that enhance the attractiveness of the reader.

We considered that such work is welcome, and we wanted it to be an effective means of learning and, at the same time, a model for the development of the documentation for current or prospective programmers.

III. Theoretical Basis

In the development of the present material, we approached the theoretical and practical issues, having the documentation connected to the bibliography in Paragraphs 1 and especiallly 2, as a starting point.

a) *Working with files in VB [2]*

The large amount of the data to be processed requires the storage of the data in collections that have records of a well defined structure. As we mentioned before these are called files. Like other advanced programming languages, VB offers the possibility of processing the data stored in files.

To enable the writing or reading of information to /from files and to protect the data stored in files, they must undergo some opening, respectively closing tasks, before or after their "use". For the description of the tasks as open, close, read or write of information stored in files, in the VB programs, the program has specific instructions defined.

i. *Open a file [2]*

Prior to input / output operations on the data stored in files, VB requires the opening of the file. This process is described in VB by the *Open* instruction, whose general syntax is the following one:

Open file specifier *For mode [Access]* access *[lock] As [#]* file number [*Len* = length article]

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The significance of the parameters that appear in the command syntax is as follows:

- *file specifier*: specifies the file to be submitted to the opening operation. Let us remember that by file specifier we understand: [<username> disc>] [<path of acces>] name [. Extension]. If the thus specified file does not exist on the disk, and the way of opening corresponds to an opening file is then it is created.
- *access*: allows specifying the type of access of the data in the file. Thus, the sequential access mode should be indicated *Append* (add new records to an existing file), *Input* (reading data from an existing file) or *Output* (creating a new file), and, in case you want to open a direct access you use the *Random* option.
- *file number*: a file identification number between 1 and 255. It is a work area in which the file opens. Thus for the Input or Random modes, we can open a file without closing a copy of the attached work elsewhere, namely another file number. For the Append and Output modes, opening the file can be done only after closing the copy which is already opened into another area.

To open multiple files simultaneously, it is recommended that the number of work area attached to the file, to contain the value returned by Free Find (this function returns the next number of a free zone in which the file can be opened). To determine the record length of a file RecLength function can be used.

Open instruction can be used only for opening files from VB applications, not other applications such as Word, Excel or Access.

ii. *Closing a file [2]*

To ensure the security of data stored in files, after their use, these should be subject to the closing operation. The shutdown operation of files in VB is achieved by *Close* instruction having the follwing general syntax:

Close [list of file numbers]

Close instruction without parameter has the effect of closing all files that are active at the time. For files opened with Append or Output, all data in the buffer area associated with the file are transferred before closing. Closing a file results in ending the relation between the file and the associated buffer zone, which is thus released.

iii. *Accessing a file [1] [2]*

Files can be accessed through VB programs in several ways:

¬Sequentially
¬Randomly
¬Binarily

Sequential access is possible for files opened in the Input, Output or Append ways. It is recommended in processing data stored in files on several lines of different lengths. To accomplish this way of using VB, access instructions / O Line Input # and Print # are used. They have the following general format:
Line Input # file number, variable name
Print # file number, the list of output variables

Line Input instruction has the effect of reading a record from the file indicated by file number and storing the data read in the internal memory (buffer) associated to the variable whose name appears as a parameter of the instruction. Following the execution of this instruction on an open file with the Open instruction, the data are read from the file, character by character, to meet the CRLF code sequence (Carriage Return Line Fide), which marks the end of a line in the file, and are transferred to the buffer are associated to the file.

Print instruction allows indication of the the operation of VB program writes data in a file identified by the file number currently the command parameter. List of output variables contains variables, arithmetic expressions or strings that are intended to be stored on a new line of the file. If this parameter is missing, the file will be written a blank line.

Random access (Random) is used when data records are structured the same length and the same structure in fields. In this case access to the data stored in the file is done directly on the registration sought. To ensure that the description of the input / output files opened in Random mode have been designed in VB following instructions:

Get # file number [number of article] variable name
Put # file number, [number of article] variable name

Get instruction allows reading from the file identified by the file number of the article with the number indicated as a parameter and storing it in a variable whose name is mentioned.

Put instruction allows data transfer from the variable indicated in an article name of the file that was specified via the file number.

Next we consider an *issue that requires the use of files to solve it in VB: the record of student academic situation of a university regarding the computer science subjects*. Each student must store the following information: registration number, first name second name, faculty, group and year of study, grade connected to practical examination1, grade connected to practical examination 2, final grade for each semester.

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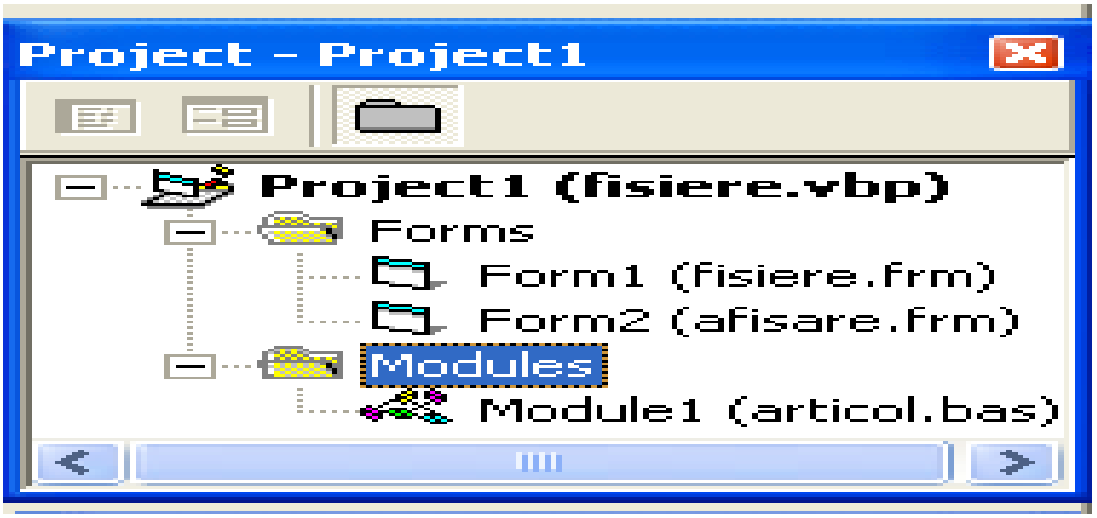

Fig. 1 : VB project structure

We associated two forms and one module to the application as shown in Fig.1

In *Module1* (stored on the hard disk in file *articol.bas*) we described the structure of an article in the *student* file. It is created in the Random way to store information regarding a student as required by the issue. The program code associated with the *article* module is the following one:

```
Type articol
   nr_matr As Integer
   nume As String * 20
   pren As String * 25 modulus
   fac As String * 10
   grupa As Byte
   notap1_1 As Byte
   notap2_1 As Byte
   notas_1 As Byte
   nota1 As Byte
   notap_2 As Byte
   notas_2 As Byte
   nota2 As Byte
End Type
```

Fişiere.vbp project consists of *fişiere.frm* and *afişare.frm* forms and *articol.bas* way, whose content was previously presented. We remind you that if the first form is automatically created a project, for the introduction of other forms in the project we proceed as follows: click the mouse Right on *Forms* from *Project Explorer* and access the *Add* function. You can then select *Form* and a new form in the project is included.

Form1 form of the project will have the interface shown in Fig. 2 . We can notice the presence of a *label* type controller which has the task to enter a title for the window managing the project, of 5 *control buttons* for the implementation of the project functions and a *text casset* type controller for the transmition of the parameters necessary to *Form2* form.

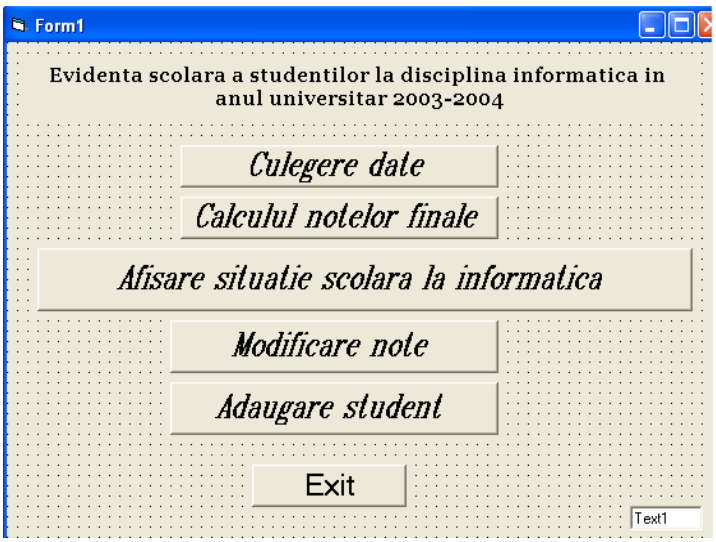

Fig. 2 : The opening window of the project

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Form 1

Student study situation record regarding the IT subject in 2014-2015 accademic year

Data gathering
Final grades calculation
Displaying the student study situation regarding the IT subject
Modify grade
Add student
Exit

Further on we present the program code associated to the first form and objects in its interface:

```
Dim s As articol
Dim i, j As Byte
Private Sub Command1_Click()
Dim gata As Boolean
Dim r As String * 1
Open "student" For Random As #1
i = 1
Data = False
While Not gata
   s.nr_matr = InputBox("Numarul matricol al studentului" Student registration number)
   s.nume = InputBox("Numele studentului" Student last name)
   s.pren = InputBox("Prenumele studentului" Student first name)
   s.grupa = InputBox("Grupa si anul de studiu" Group and year of study)
   s.notap1_1 = InputBox("Nota la prima proba practica sem. I" Grade for the first practical examination -1st semester)
   s.notap2_1 = InputBox("Nota la a doua proba practica sem. I" Grade for the second practical examination -1st semester)
   s.notas_1 = InputBox("Nota la proba scrisa sem. I" Grade for the written examination -1st semester)

   s.notap_2 = InputBox("Nota la a doua proba practica sem. II" Grade for the second practical examination -2 nd semester)
   s.notas_2 = InputBox("Nota la proba scrisa sem. II" Grade for the written examination -2nd semester)
   Put #1, i, s
   r = InputBox("Gata adugare? [d/n]" Ready to add[y/n] ?)
   If r = "d" Then
      gata = True
   Else
      i = i + 1
   End If
Wend
Close #1
End Sub
Private Sub Command2_Click()
i = InputBox("Cati studenti aveti in vedere?"How many students do you take into consideration?)
Open "student" For Random As #2
j = 1
While j <= i
   Get #2, j, s
   If s.notap1_1 > 4 Then
      If s.notap2_1 > 4 Then
```


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```
            If s.notas_1 > 4 Then
               s.nota1 = (s.notap1_1 + s.notap2_1 + s.notas_1) / 3
            End If
         End If
         Else
         s.nota1 = 0
      End If
      If (s.notap_2 > 4) And (s.notas_2 > 4) Then
         s.nota2 = (s.notap_2 + s.notas_2) / 2
         Else
         s.nota2 = 0
      End If
      Put #2, j, s
      j = j + 1
Wend
Close #2
End Sub
Private Sub Command3_Click()
Form1.Hide
i = InputBox("Cati studenti aveti in vedere?" How many students do you take into consideration?)
Form1.Text1.Text = Str(i)
Form2.Command1.Enabled = True
If i = 1 Then
  Form2.Command1.Enabled = False
End If
Form2.Show
End Sub
Private Sub Command6_Click()
End
End Sub
Private Sub Form_Load()
   Form1.Text1.Visible = False
End Sub
```

It should be mentioned that we only developed the software codes associated to the first three of them and to the last of the control buttons. The other two (changing or adding a new record) were left as an exercise for the reader.

Form2 form meets only the function to ensure the school situation display for each and every student. Data are displayed on the screen in the form *afisare.frm* interface whose interface is shown in FIG. 3. The form contains text and label type controllers and command buttons.

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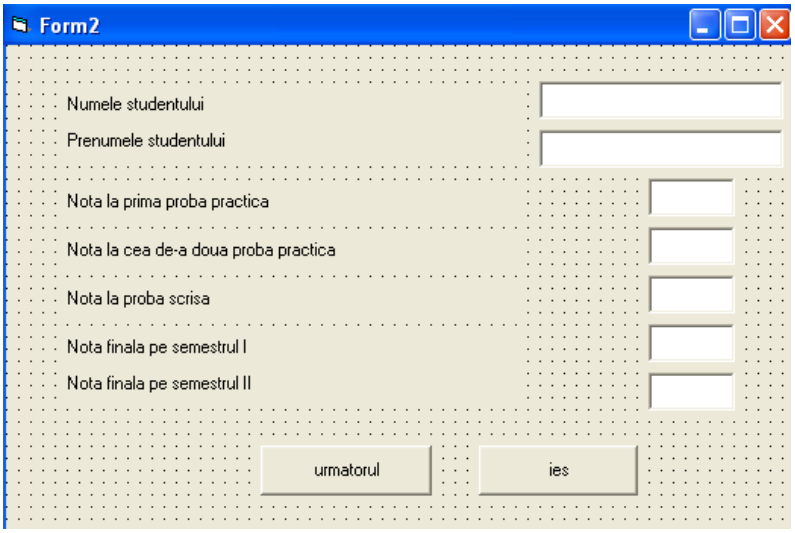

Fig. 3 : Data gathering layout

Student's last name
Student's first name
Student's grade - first practical examination
Student's grade - second practical examination
Student's grade for the written examination
Student's final grade- first semester
Student's final grade- second semester

The program code associated to *Form2* form is the following one:

```
Private Sub Form_Load()
   Open "student" For Random As #3
   Dim s As articol
   Get #3, 1, s
   Form2.Text1.Text = s.nume
   Form2.Text2.Text = s.pren
   Form2.Text3.Text = Str(s.notap1_1)
   Form2.Text4.Text = Str(s.notap2_1)
   Form2.Text5.Text = Str(s.notas_1)
   Form2.Text6.Text = Str(s.nota1)
   Form2.Text7.Text = Str(s.nota2)
   Close #3
End Sub
```

This program code opens the "student" file and displays the data related to the first student and closes this file.
The program code associated with the command button is as follows:

```
Dim i As Byte
Private Sub Command1_Click()
        i = CInt(Form1.Text1.Text)
        j = 2
        Open "student" For Random As #3
        Dim s As articol
  While j <= i
     Get #3, j, s
     Form2.Text1.Text = s.nume
     Form2.Text2.Text = s.pren
     Form2.Text3.Text = Str(s.notap1_1)
     Form2.Text4.Text = Str(s.notap2_1)
     Form2.Text5.Text = Str(s.notas_1)
     Form2.Text6.Text = Str(s.nota1)
```


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```
        Form2.Text7.Text = Str(s.nota2)
        j = j + 1
    Wend
    Close #3
    Form2.Command1.Enabled = False
End Sub
```

The program code contains the receiving of the number of students for which display is wanted, the opening of the file and the displaying of the student academic situation for all students, beginning with the second one. At the end of the listing process, the *next* button is disabled (the last instruction of the code).

The program code associated to the *ies* button has the purpose to revert to the first form and is given as follows:

```
Private Sub Command2_Click()
    Form2.Hide
    Form1.Show
End Sub
```

We leave the designing of a program code associated to the command buttons *Change student grades* and *Add student* in window shown in Fig.2, as an exercise to the reader.

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