The Experience in Teaching of Programming at Elementary Schools

Vítězslav Novák

Department of Applied Informatics
Faculty of Economics, VŠB - Technical University of Ostrava
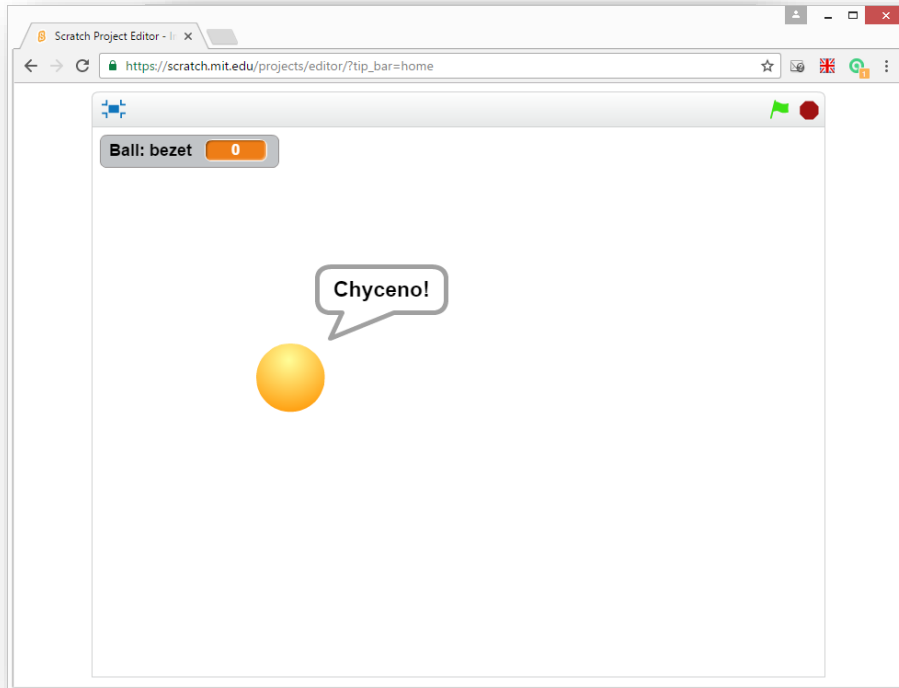
Project

➔ **Project's name**: Introduction to programming in Visual Basic for Application.

➔ **Program's name**: State support for work with children and youth for non-governmental organizations.

➔ **Grant area**: Supporting of talented pupils of elementary and secondary schools in 2016.

➔ **Project implementer**: VŠB-TU Ostrava, Innovation Support Centre.

➔ **Afternoon lessons**:

- elementary school at Valašské Meziříčí,
- 15 children from classes 7 to 9,
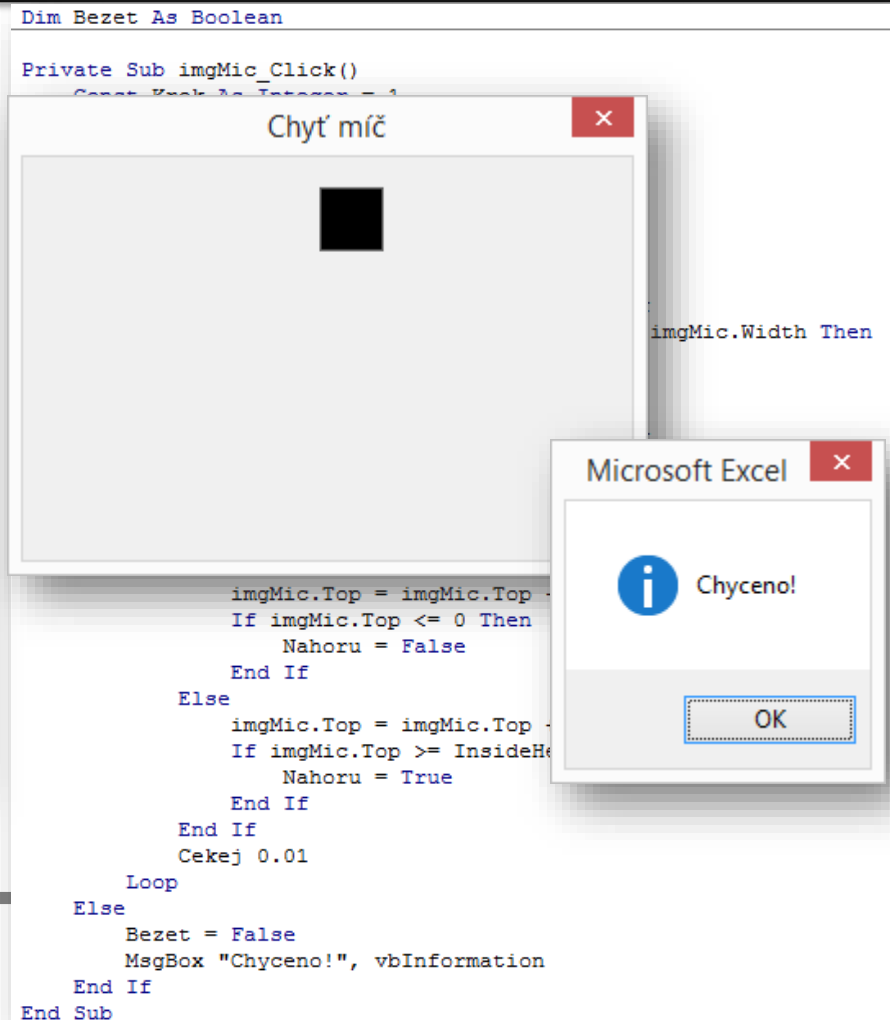- 10 times every 14 days, lasting 3 teaching hours.

What type of programming language to choose?

Visual programming language

Classical programming language

What type of programming language to choose? Positives x Negatives

	Visual programming languages	Classical programming languages
System requirements	**+** (Low, Web browser)	**?** (it depends, VBA (Excel) x Java)
Language difficulty	**+** (Low) (- Czech language, - simple syntax, - no data types, - you can create nice games with graphics, sounds etc. more quickly)	**-** (High) (- English language, - more complicated syntax, - data types, - you can create only simple games, games with graphics and sounds are only for experienced programmers etc.)
Language's usability in different areas	**-** (Low)	**+** (Higher)

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What classical programming language to choose?

➔ It is necessary to consider many often contradictory characteristics, e.g.:

  ▪ structured language x object-oriented languages,

  ▪ strongly typed language x weakly typed language,

  ▪ language with IDE with high system requirements x language with IDE with low system requirements etc.

➔ Why the Visual Basic for Application in Excel was chosen?

  ▪ Available development environment (Excel is a standard).

  ▪ Low system requirements.

  ▪ Relatively simple syntax.

  ▪ It is not object-oriented language but it supports working with objects.

  ▪ Weakly typed language, there is no need to declare variables in VBA (but it is recommended).

  ▪ Pupils can use the knowledge of VBA in their future life.

How to teach children programming in VBA?

→ Minimum of theory (theory is simply boring for children).

- basic data types (Boolean, Integer, String),
- program flow control commands such as loop or conditional statement,
- principle of using subroutines and functions (including several VBA functions such as MsgBox or InputBox),
- arrays,
- principle of using forms and their controls, their properties and events,
- error handling.

→ Used MS Office application is not important.

→ Programming of games.

→ Let something happen by itself.
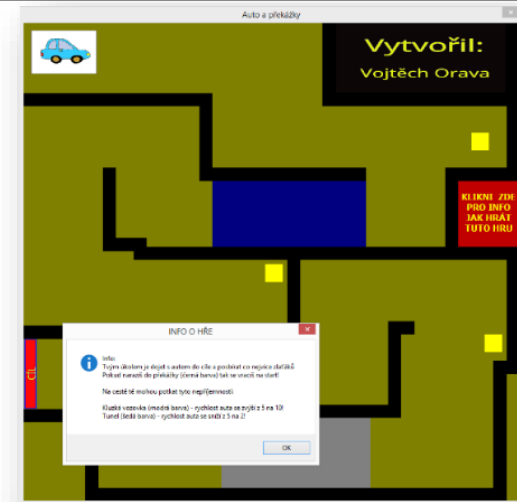
```
Sub Wait(Seconds As Single)
    Dim EndOfPause As Single
    EndOfPause = Timer + Seconds

    Do While Timer < EndOfPause
        DoEvents
    Loop
End Sub
```

Conclusion

→ Although 15 "talented" pupils attended VBA lessons, only 5 pupils were really active and interested in programming. The proof can be their activity in lessons and their voluntary homework.

- they were supposed to create a program with output in either console, Excel worksheet or form and everybody chose a game in the form.

Thank you for your attention