

**ИНФОРМАТИКА И КОМПЮТЪРНИ НАУКИ
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VBA AS A FIRST TEXT-BASED PROGRAMMING LANGUAGE

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Abstract: *Programming is an important asset in today's world. Everyone has been talking about AI since LLMs like ChatGPT at the latest. The first programming language that springs to mind in this context is Python. But why VBA is the more suitable first programming language, even directly before Python, is explained in this article.*

In companies, the integrated scripting language VBA is often used for the digital process automation of Microsoft products. This is due to the enormous availability (every Office product already has the corresponding IDE, VBE, on board), but also due to the easy-to-learn syntax, as VBA is based on BASIC. Due to its practical relevance in companies, high availability and low barrier to entry, VBA is the ideal first programming or scripting language for new programmers according to the author. MS Excel also has a macro recorder, which can be used to convert actions directly into code. As changes are immediately visible, the learning effect is enormous.

Keywords: *VBA; scripting language; programming education; MS Office; programming language*

INTRODUCTION

The ability to programme is becoming increasingly important, also because of the AI hype. To understand ML and AI in particular, models should be trained by students using Python. However, Python is not necessarily ideal as a first programming language. Of course, the syntax is expressive. However, an IDE and Python itself must first be installed, packages have to be installed via pip etc. What is often not even possible in companies is at least exhausting at home. Of course, it would be more convenient if everything was already installed on the PC. And that's exactly how it is with VBA on any PC that has MS Office installed. VBA is one of many scripting languages. However, experienced programmers tend to think of bash, cmd, JavaScript or perhaps even VBS when they think of scripting languages – but not VBA. In comparisons of scripting languages, VBA is often not even mentioned; in the Popularity of Programming Language (PYPL) Index, VBA has a share of less than one per cent (cf. Carbonnelle 2024). And yet the scripting language is extremely important in companies (cf. Kleinz 2022). So important, in fact, that MS promptly reversed a deactivation by default of VBA in Microsoft 365 (cf. Hill 2022).

“[...] VBA is still the preferred way to customize Microsoft Office applications for the desktop.” (Hamilton 2023)

The author's first programming language was C at a technical upper-level secondary school. In his opinion, this hardware-related language is completely unsuitable as the first programming language for a number of reasons, including the fact that it requires extensive knowledge of the computer's memory system. The author's opinion (from the perspective of a former learner) is shared by a professor, Ian Barland from Radford University, among others (cf. Barland 2019).

No extensive prior knowledge is required for VBA, but there are many other reasons that speak in favour of VBA as the first programming language. Why VBA is suitable as the first programming language will be explained below.

RESEARCH METHODOLOGY

The chosen methodology is that of a case study. The author has many years of experience in the field of data analysis and tutoring apprentices, high school graduates and students in a professional environment and is therefore the object of the case. As he often observed difficulties in students

with their first programming language (e.g. C), his experience with VBA led him to believe that it would be a more suitable first programming language. For this reason, the research question of the paper is why VBA should be the more suitable first programming language than other languages. Therefore, the opinion based on the author's experience is described and supported by literature.

RESULTS

This is not the first paper to deal with the question of the optimal first programming language (Gupta 2004). The relevance of the first programming language lies, among other things, in the fact that it characterizes the programmer. Programmers prefer the first programming language they learnt, this even goes so far that the style and structures are used in subsequent programming languages (Wexelblat 1980). There are some papers that recommend a different language as a good first programming language or focus on a specific language as a first programming language, but why VBA is the right first programming language for the author follows:

- Available virtually everywhere

Nearly every PC has installed MS Office. As soon as MS Office is installed on the PC, Office's own IDE, VBE, is automatically on board. In 2020, for example, 85% of companies in Germany used MS Office (Empower & Nielsen 2020). Of course, many home PCs also have MS Office, but these statistics are primarily intended to illustrate its relevance in companies.

- Easy to learn

VBA is comparatively easy to learn due to its BASIC roots. In C, for example, the standard input and output file must already be included for the output "Hello, World!" so that the output function `printf` works. The main function is preceded by an `int` data type, although other data types are not permitted in this case. The programme is ended with a `return 0`, followed by a curly bracket. What ends the programme now, the bracket or the return? Even "Hello, World!" raises questions for the programming novice.

In contrast, VBA requires exactly one line in addition to the first and last line, which delimit the programme without brackets and `return 0`: `MsgBox ("Hello World!")`. This outputs a message box with the content "Hello World!", as can also be surmised by laypersons. It doesn't get much simpler than this.

Another huge advantage is that the scripting language can be practised at home on the computer as soon as MS Office is installed. Only the developer options need to be activated, there is no need to install an IDE or any packages. Many parts of object-oriented programming (OOP) can be learnt using VBA, as VBA supports classes.

- Guided learning

Excel has a so-called macro recorder, which records many executed activities and converts them into VBA code. This is then saved in a module and can be viewed. This allows you to try out a variety of things and see directly what this looks like as VBA code. This guided learning is particularly efficient, as actions can be converted directly into code and viewed immediately. The generated code is far from ideal, for example cells are marked where a cell could have been referenced directly. With this knowledge, however, it is possible to optimize the generated code, which has a further learning effect.

- Relevant scripting language

VBA is still a very relevant scripting language in industrial companies. It is often the only way for organizations to automate digital processes due to restrictive software restriction policies. IDEs for Python, for example, are often not allowed to be installed and even the successor to VBA, Office Scripts, is often blocked. Furthermore, virtually all existing scripts in Excel workbooks, PowerPoint presentations etc. are based on VBA, and adapting them all is a very difficult endeavour.

Many universities teach Assembly or C as an introduction, but these programming languages only have very specific purposes, VBA can be used for everyday problems in companies and at home. Furthermore, the entry barriers are much higher with the mentioned programming languages and the syntax is much easier to understand with VBA. Other universities such as Wisconsin-Platteville University have recognized the advantages of VBA and use it for programming and

data acquisition, for example (Evensen 2014).

- Applicable for everyday problems

VBA can be used for everyday problems. Each value of a column in Excel must be divided by three? No problem at all. Of course, you could create an auxiliary column and overwrite the original column, but where would the programming fun be in that? The effect of the VBA code is also directly visible in Excel and Office in general, which is particularly rewarding.

- Nearly object oriented

Although VBA is primarily an event-driven, object-orientated programming paradigm, it also supports procedural and structured programming. Classes and objects can be created in VBA, which is typical of object-orientated programming. The only thing VBA lacks to become a fully-fledged OOP language is one of the four pillars of OOP, inheritance (Kasture 2019). However, since classes and objects can be created in VBA, basic OOP paradigms can be taught.

CONCLUSION

VBA is very well-suited as an introduction to the world of programming. The simple syntax, easy accessibility and relevance in companies not only make the scripting language very easy to get started with, but also offer real added value. Many universities use Assembler or C as a starting point, but these programming languages only have very specific purposes, VBA can be used for everyday problems. For these and other reasons, VBA is, in the author's opinion, a very suitable first programming language. Some universities have also recognized this and are using VBA in their teaching.

REFERENCES

- BARLAND, I., 2019. *Why C and C++ are bad*. 25 April. [viewed 10 July 2025]. Available from: <https://sites.radford.edu/~ibarland/Manifestoes/whyC++isBad.shtml>
- CARBONNELLE, P., 2024. *PYPL popularity of programming language index*. January. [viewed 10 July 2025]. Available from: <https://pypl.github.io/PYPL.html>
- EMPOWER; NIELSEN, 2020. *Die große Office-Software Studie: Wie Unternehmen mit Office arbeiten*. [viewed 10 July 2025]. Available from: https://www.empowersuite.com/hubfs/Marketing/Downloads/Office%20Studie%202020/Die%20gro%C3%9Fe%20Office%20Studie_empower%20GmbH.pdf
- EVENSEN, H., 2014. A versatile platform for programming and data acquisition: Excel and Visual Basic for Applications. In: *2014 ASEE Annual Conference & Exposition Proceedings*, pp. 24.125.1–24.125.12. [viewed 10 July 2025]. Available from: <https://doi.org/10.18260/1-2--20017>
- GUPTA, D., 2004. What is a good first programming language? *XRDS: Crossroads, The ACM Magazine for Students*, vol. 10, no. 4, p. 7. [viewed 10 July 2025]. Available from: <https://doi.org/10.1145/1027313.1027320>
- HAMILTON, T., 2023. Is Excel VBA still worth learning in 2024? *Training Hamilton*, 7 August. [viewed 10 July 2025]. Available from: <https://www.traininghamilton.com/is-excel-vba-still-worth-learning/>
- HILL, J., 2022. *VBA-Makros in Office: Microsoft bringt Makros zurück – vorübergehend*. 12 July. [viewed 10 July 2025]. Available from: <https://www.computerwoche.de/a/microsoft-bringt-makros-zurueck-voruebergehend,3553723>
- KASTURE, D., 2019. Pillars of object oriented system. *International Journal for Research in Applied Science and Engineering Technology*, vol. 7, no. 12, pp. 589–591. [viewed 10 July 2025]. Available from: <https://doi.org/10.22214/ijraset.2019.12096>
- KLEINZ, T., 2022. VBA-Makros: Microsoft Office öffnet die Büchse der Pandora wieder. *Der Spiegel*, 11 July. [viewed 10 July 2025]. Available from: <https://www.spiegel.de/netzwelt/apps/vba-makros-microsoft-office-oeffnet-die-buechse-der-pandora-wieder-a-753af73c-c848-416b-9fc1-67f7fa322bd7>
- WEXELBLAT, R. L., 1980. The consequences of one's first programming language. In: *Proceedings of the 3rd ACM SIGSMALL Symposium and the First SIGPC Symposium on Small Systems (SIGSMALL '80)*. Palo Alto, California, United States: ACM Press, pp. 52–55. [viewed 10 July 2025]. Available from: <https://doi.org/10.1145/800088.802823>

VBA КАТО ПЪРВИ ТЕКСТОВО БАЗИРАН ПРОГРАМЕН ЕЗИК

Резюме: Програмирането е важен актив в днешния свят. Всички говорят за изкуствен интелект, откакто се появила LLM като ChatGPT. Първият език за програмиране, който идва на ум в този контекст, е Python. Но защо VBA е по-подходящият първи език за програмиране, дори пред Python, е обяснено в тази статия.

В компаниите интегрираният скриптов език VBA често се използва за цифрова автоматизация на процесите на продуктите на Microsoft. Това се дължи на огромната му достъпност (всеки продукт на Office вече разполага със съответния IDE, VBE), но и на лесния за научаване синтаксис, тъй като VBA се базира на BASIC. Благодарение на практическата си приложимост в компаниите, високата достъпност и ниската бариера за навлизане VBA е идеалният първи език за програмиране или скриптове за нови програмисти според автора. MS Excel разполага и с макрорекордер, който може да се използва за преобразуване на действия директно в код. Тъй като промените са видими веднага, ефектът от ученето е огромен.

Ключови думи: VBA; скриптов език; обучение по програмиране; MS Office; език за програмиране

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