

Integrating ChatGPT in Visual Basic Programming (VB.Net): A Study of Students' Learning Experience

L. Shanmugam*, M. I. Ismail, M. H. A. Fadzil

Department of Information Technology and Communication
Politeknik Balik Pulau, Pinang Nirai, 11000 Balik Pulau, Pulau Pinang, Malaysia.

*Corresponding Author's Email: letchumanan@pbu.edu.my

Article History: Received 14 August 2023; Revised 4 October 2023;
Accepted 21 November 2023

©2023L.Shanmugam et al. Published by Jabatan Pendidikan Politeknik dan Kolej Komuniti.
This article is an open article under the CC-BY-NC-ND license
(<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

Abstract

This study investigated the integration of ChatGPT into the learning of Visual Basic Programming (VB.NET) among students, as a potential solution to the limitations of existing platforms for teaching Visual Basic programming. The study aimed to assess the potential benefits of ChatGPT in enhancing the learning process and to evaluate its impact on individual learners. To collect data, semi-structured interviews were conducted with three purposively sampled students one of the Department of Information Technology at a northern polytechnic in Malaysia. The findings revealed that students favoured online platforms for learning, with W3Schools being the most popular. The study highlights the need to develop tailored platforms that cater to the specific needs of individual learners and underscores the potential benefits of integrating ChatGPT into Visual Basic programming education.

Keywords: ChatGPT; Visual Basic Programming; Qualitative Study

1.0 Introduction

ChatGPT is a state-of-the-art language model developed by OpenAI for use in conversational artificial intelligence (AI) systems. It was specifically designed to serve as a highly effective chatbot that is capable of comprehending and responding to natural language input from users, as well as performing tasks and providing information on a broad range of topics (Radford et al., 2019; Brown et al., 2020).

The development of ChatGPT was informed by earlier successful language models, such as GPT-2 and GPT-3, but features several unique characteristics that make it particularly suitable for use in conversational AI. For instance, it was trained on a vast corpus of text data, comprising books, articles, and online forums, which imbues it with the ability to understand and respond to a wide array of topics. Additionally, it possesses a highly efficient and scalable architecture that allows it to swiftly process input and respond in a conversational manner (Brown et al., 2020).

One of the most significant advantages of ChatGPT is its capacity for continuous learning and improvement through its interactions with users. This is achieved via a technique called "fine-tuning," which involves adjusting the model's weights based on fresh data and feedback from users. As a result, ChatGPT can adapt to the diverse needs and preferences of different users,

making it a highly personalized and effective conversational AI system. Notwithstanding its many benefits, ChatGPT also has some limitations. For instance, it may not consistently provide accurate or reliable information on certain topics, as its responses are exclusively based on the data it was trained on. Furthermore, it may encounter difficulties with comprehending more complex or nuanced language usage, such as sarcasm or irony (Vaswani et al., 2017).

Visual Basic Programming, also known as VB.NET, is a popular programming language that is widely used for developing Windows desktop applications, web applications, and mobile applications. It was first introduced by Microsoft in 2002 and has since evolved to become one of the most versatile and accessible programming languages for developers of all skill levels. VB.NET is a high-level language that is designed to be easy to learn and use, making it an ideal choice for beginners who are just starting to learn programming (Microsoft, 2022).

One of the key features of VB.NET is its ability to quickly create graphical user interfaces (GUIs) for applications. This is achieved through the use of drag-and-drop controls, such as buttons, text boxes, and labels, which can be easily placed and customized within the application. VB.NET also provides access to a large library of pre-built functions and controls, which can help speed up the development process and simplify common programming tasks. Overall, VB.NET is a powerful and flexible programming language that offers a wide range of capabilities for developing applications across multiple platforms.

The acquisition of Visual Basic programming skills involves the use of diverse platforms, both online and offline. However, not all of these platforms provide a tailored approach that meets the specific needs of individual students in the learning process of Visual Basic programming. As such, this study aims to explore the potential benefits of integrating ChatGPT into Visual Basic learning, and whether such integration directly facilitates the learning process.

2.0 Methodology

The present study employs semi-structured interviews as the primary technique for collecting detailed and comprehensive data. As described by Punch (2005); Patton (2015), interviews involve a dialogic exchange between researchers and respondents, in which questions are posed and answers are provided. This method is particularly useful for obtaining immediate and voluminous data. Merriam (2009) notes that interviews offer a swift means of acquiring information within a short period of time. In the context of the present investigation, interviews were conducted by the researcher with participants to elicit precise and accurate information, and to corroborate the findings obtained from the interviews. The use of interviews also allows the researcher to obtain direct statements from participants about their opinions, thoughts, views, and experiences, thereby enhancing the study's rigor and validity.

Table 1: Methodology

Research Objective	Research Design	Sampling Techniques	Number of Respondents	Type of Instruments
RO1	Qualitative	Purposive Sampling	3 Students Visual Basic Programming Course Department of Information Technology at one of the northern polytechnics in Malaysia	Semi-structured Interview

3.0 Result and Discussion

In this study, the researchers employed semi-structured interviews and formulated the following question:

Q1 : Do you use an offline or online platform to learn visual basic programming? If so, could you provide examples of these platforms.

PBUR1: *“hmmmm...Offline platforms for learning Visual Basic programming include textbooks, online or offline courses, and software packages like Visual Studio. These resources allow individuals to learn the programming language at their own pace and in a structured way. Online platforms for learning Visual Basic programming include websites such as W3Schools, Codecademy, Udemy, and Coursera....”*

PBUR2: *“Yes sir, but not familiar with textbook, only use w3 school website to explore VB.CODE”*

PBUR3: *“Books very difficult to get sir, sometime high price, so I used w3 school”*

Based on data, it is evident that all three respondents employed an online platform, namely W3School, to learn Visual Basic programming. Notably, only one of the respondents reported utilizing an offline platform. This finding indicates that students possess a keen inclination towards online learning platforms due to their user-friendly and comprehensible nature.

Q2 : If you were presented with an opportunity to learn Visual Basic programming through the ChatGPT platform, would you consider using it?

PBUR1: *“hmmmm...chatGPT, yes sir.But, if request...”*

PBUR2: *“Yes. It is easy to use and it gives almost correct answers. Not only that, it also explains what is going on in the code”*

PBUR3: *“Yes sir, it sound looks interesting”*

The findings revealed that all three respondents expressed their interest in using the ChatGPT platform for this purpose. Respondent PBUR1 expressed hesitation and sought clarification about the ChatGPT platform, but ultimately stated that they would try it. Respondent PBUR2 expressed a positive attitude towards using the ChatGPT platform, citing its user-friendliness, accuracy, and explanation of coding processes as its advantages. Respondent PBUR3 also expressed interest in using the ChatGPT platform, finding it intriguing. These findings suggest that the ChatGPT platform may serve as a viable option for those interested in acquiring proficiency in Visual Basic programming.

Q3 : Can you describe your experience with using ChatGPT for writing code? In what ways do you think ChatGPT has been helpful for you?

PBUR1: *"Yes, ChatGPT can provide assistance when writing code in Visual Basic programming language. If you have a specific coding question or are stuck on a particular coding problem, you can ask ChatGPT for help and it will do its best to provide you with a helpful response. ChatGPT can provide information on syntax and programming concepts, suggest code examples, and help troubleshoot errors or bugs in your code"*

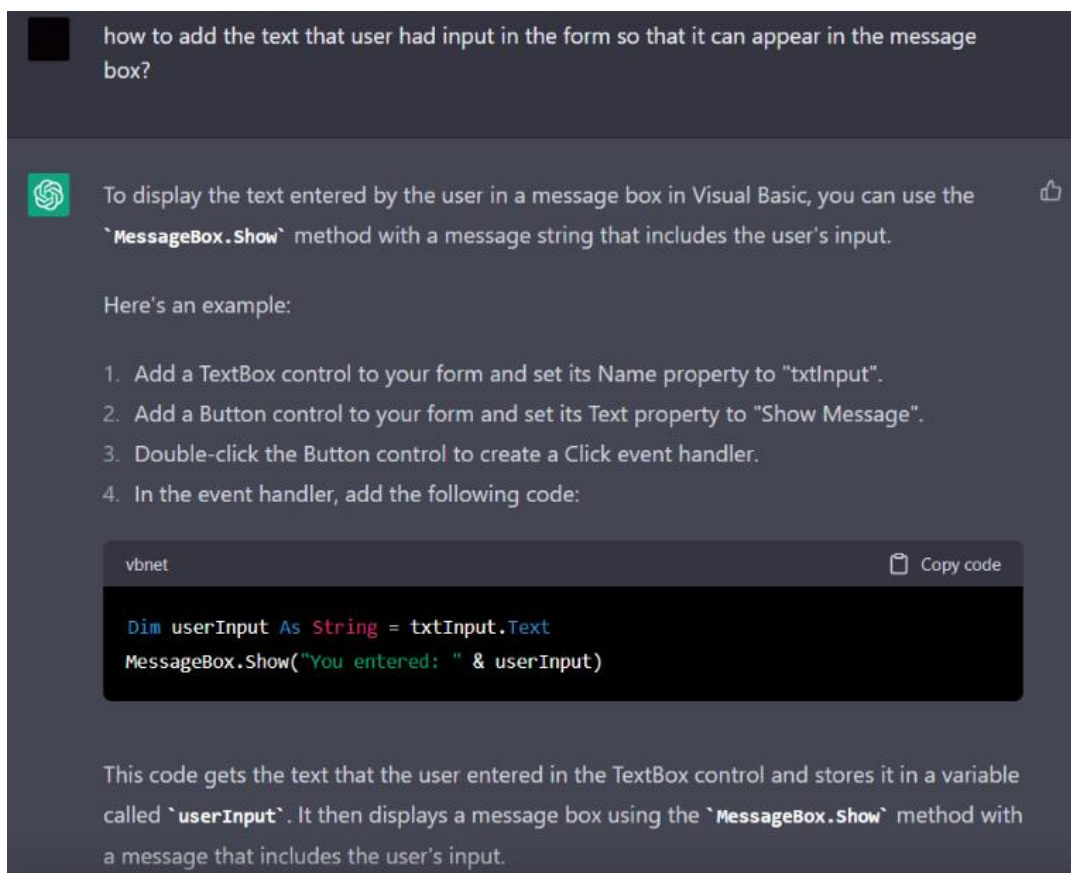
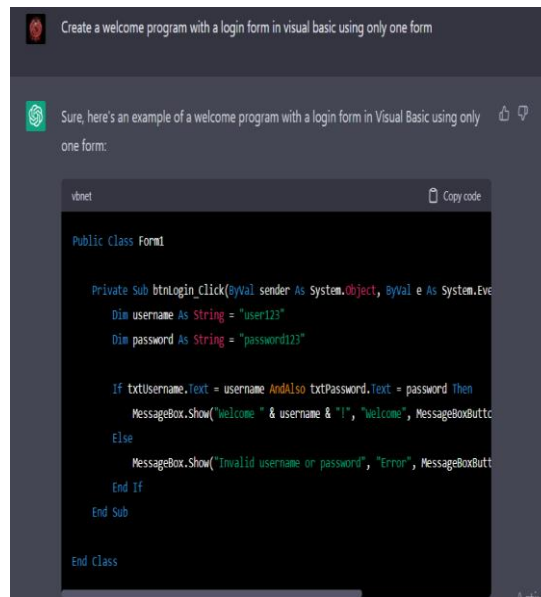


Figure 1: Demo from respondent PBUR1
Patton (2015)

PBUR2: *“yes. ChatGPT offered snippets of code or even write parts or all of the program”*



Create a welcome program with a login form in visual basic using only one form

Sure, here's an example of a welcome program with a login form in Visual Basic using only one form:

```
vbnet Copy code

Public Class Form1

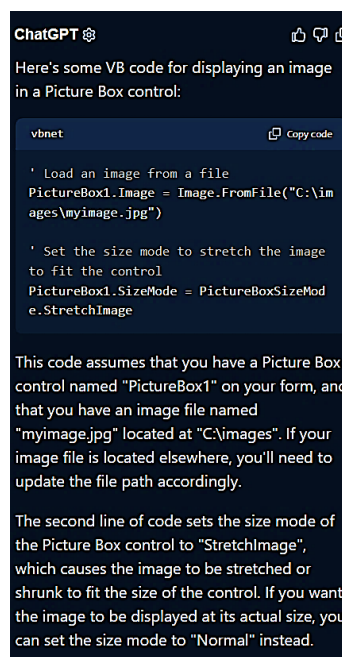
    Private Sub btnLogin_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles btnLogin.Click
        Dim username As String = "user123"
        Dim password As String = "password123"

        If txtUsername.Text = username AndAlso txtPassword.Text = password Then
            MessageBox.Show("Welcome " & username & "!", "Welcome", MessageBoxButtons.OK)
        Else
            MessageBox.Show("Invalid username or password", "Error", MessageBoxButtons.OK)
        End If
    End Sub

End Class
```

Figure 2: Demo from respondent PBUR2
Patton (2015)

PBUR3: *“Yes, ChatGPT can be helpful when writing coding by providing information and suggestions related to programming concepts, syntax, and best practices. For example, if you have a specific question or problem related to writing code in a particular programming language, you can ask ChatGPT for guidance or clarification on the topic.”*



ChatGPT

Here's some VB code for displaying an image in a PictureBox control:

```
vbnet Copy code

' Load an image from a file
PictureBox1.Image = Image.FromFile("C:\images\myimage.jpg")

' Set the size mode to stretch the image to fit the control
PictureBox1.SizeMode = PictureBoxSizeMode.StretchImage
```

This code assumes that you have a PictureBox control named "PictureBox1" on your form, and that you have an image file named "myimage.jpg" located at "C:\images". If your image file is located elsewhere, you'll need to update the file path accordingly.

The second line of code sets the size mode of the PictureBox control to "StretchImage", which causes the image to be stretched or shrunk to fit the size of the control. If you want the image to be displayed at its actual size, you can set the size mode to "Normal" instead.

Figure 3: Demo from respondent PBUR3
Patton (2015)

Based on the qualitative analysis of responses from three respondents, it can be concluded that ChatGPT is a helpful resource for individuals who are writing code in Visual Basic programming language. Respondent PBUR1 notes that ChatGPT can provide assistance with specific coding questions and can offer information on syntax and programming concepts, as well as help troubleshoot errors. Respondent PBUR2 goes a step further, suggesting that ChatGPT can provide code snippets or even write parts or all of a program. Respondent PBUR3 reinforces the idea that ChatGPT can be helpful by providing guidance and clarification on programming concepts and best practices.

Overall, the responses suggest that ChatGPT can be a valuable tool for individuals who are writing code in Visual Basic. It can offer a range of services, from simple advice to more complex code writing. As such, it may be beneficial for those who are struggling with specific coding questions or problems to seek assistance from ChatGPT. Future research could explore the effectiveness of ChatGPT as a tool for improving coding skills or increasing productivity in programming tasks (Radford et al., 2019; Brown et al., 2020).

Q4 : Can you describe your experience using ChatGPT to debug your code?
How has it helped you in the debugging process?

PBUR1: *“Sure. We just need to provide the error message, and the tool will provide suggestions and all possible solutions.”*

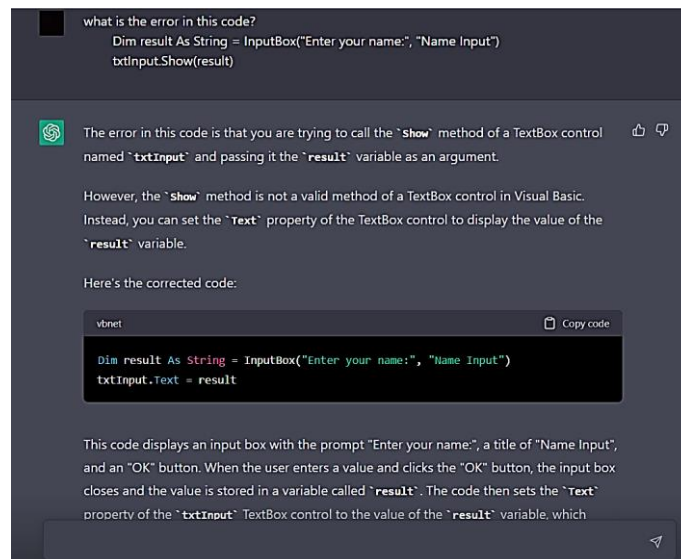


Figure 4: Demo from respondent PBUR1
Patton (2015)

PBUR2: "Yes its helps to check if there's error in coding"

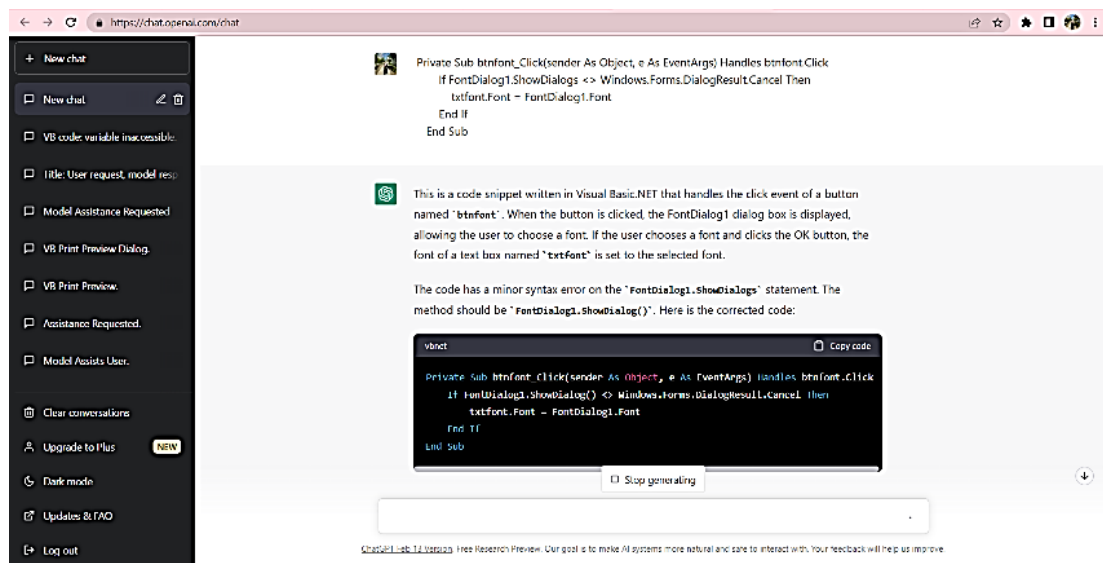


Figure 5: Demo from respondent PBUR2
Patton (2015)

PBUR3: "Yes. You just need to write the error you are getting, and it helps you with it."

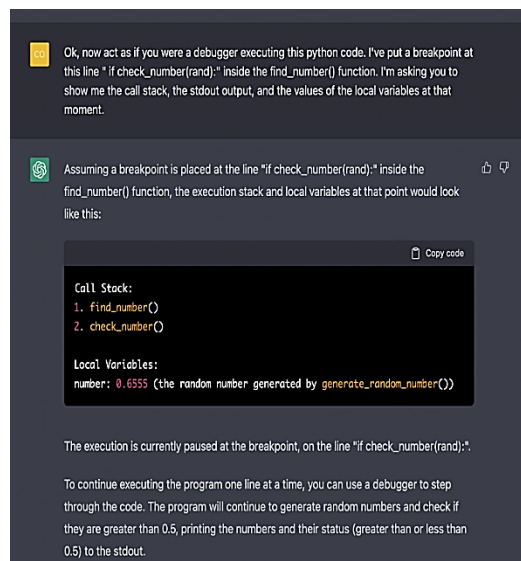


Figure 6: Demo from respondent PBUR3
Patton (2015)

Based on the responses from the three respondents in the qualitative research, it can be concluded that ChatGPT can help with debugging in programming. All the respondents agreed that ChatGPT can provide assistance in identifying and fixing errors in code. The respondents also indicated that the process of obtaining assistance from ChatGPT involves providing the error message and allowing the tool to provide suggestions and possible solutions. Therefore, ChatGPT can be a helpful resource for programmers who are experiencing issues with their code and need assistance with debugging.

Q5 : Will you be using ChatGPT for your next learning?

PBUR1: “ Yes, because it is very useful and helpful...”

PBUR2: “ Yes because it is easy and straight forward”

PBUR3: “ Yes because its easy to use and very convenient”

From the responses of the three respondents, it can be concluded that ChatGPT is a valuable resource for learning. All the respondents agreed that they would use ChatGPT for their next learning, citing its usefulness, ease of use, and convenience. Respondent PBUR1 stated that ChatGPT is "very useful and helpful", while respondent PBUR2 described it as "easy and straightforward". Respondent PBUR3 emphasized the tool's ease of use and convenience. These findings suggest that ChatGPT can be an effective tool for individuals who seek to improve their learning and programming skills.

4.0 Conclusion

This paper draws upon findings from a study conducted by Sabri (2020), Visual Basic is often lauded as an ideal programming language for beginners due to its user-friendly and visually intuitive nature, significantly lowering barriers for those new to coding. This inherent simplicity can have a positive influence on students' initial learning experiences. Furthermore, VB's provision of a visual interface for constructing Windows applications allows learners to grasp the interplay between code and the user interface, making the educational process more engaging and tangible. Its capacity for rapid application development enables students to swiftly witness the results of their coding efforts, fostering motivation and creating a positive feedback loop. Beyond programming skills, students also cultivate valuable problem-solving abilities.

Based on the findings of this study, it can be concluded that the integration of ChatGPT in the learning process of Visual Basic Programming (VB) has a positive impact on the learning experience of students. The personalized assistance and feedback provided by ChatGPT can improve students' understanding of VB concepts and help them overcome challenges they may face in programming tasks. The study also highlights the importance of considering the individual needs and preferences of students when designing AI-based learning tools. The use of ChatGPT can be particularly effective for students who prefer interactive and conversational learning experiences, and who may benefit from personalized feedback and assistance.

However, it is important to recognize the limitations of ChatGPT and AI-based learning tools in general. These tools may not always provide accurate or reliable information on certain topics, and may struggle with understanding more complex or nuanced language use. Therefore, it is essential to continue to develop and improve AI models for education, while also maintaining a human-centered approach that prioritizes the needs and preferences of learners. Overall, this study contributes to the growing body of research on the use of AI in education and provides insights for educators and developers on the potential benefits and limitations of integrating AI-based tools like ChatGPT into the learning process.

Acknowledgment

The authors would like to extend their sincere gratitude to Politeknik Balik Pulau and Jabatan Pendidikan Politeknik dan Kolej Komuniti that have made significant contributions to various parts of this research endeavor.

Author Contributions

L. Shanmugam: Conceptualization, Methodology, Supervision, Writing - Review & Editing. **M. I. Ismail:** Data curation, Investigation, Writing - Original Draft. **M. H. A. Fadzil:** Formal analysis, Software, Visualization, Writing - Original Draft.

Conflicts of Interest

The manuscript has not been published elsewhere and is not under consideration by other journals. All authors have approved the review, agree with its Submission and declare no conflict of interest in the manuscript.

References

- Radford, A., Wu, J., Child, R., Luan, D., Amodei, D., & Sutskever, I. (2019). Language models are unsupervised multitask learners. OpenAI Blog. <https://openai.com/blog/language-unsupervised/>
- Brown, T. B., Mann, B., Ryder, N., Subbiah, M., Kaplan, J., Dhariwal, P., & Amodei, D. (2020). Language models are few-shot learners. *Advances in Neural Information Processing Systems*, 33, 18720-18732. <https://proceedings.neurips.cc/paper/2020/file/1d81b3bf3a71a3e739ee8a81fa83bcb8-Paper.pdf>
- Radford, A., Narasimhan, K., Salimans, T., & Sutskever, I. (2018). Improving language understanding by generative pre-training. OpenAI Blog. https://s3-us-west-2.amazonaws.com/openai-assets/research-covers/language-unsupervised/language_understanding_paper.pdf
- Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., & Polosukhin, I. (2017). Attention is all you need. *Advances in Neural Information Processing Systems*, 30, 5998-6008. <https://proceedings.neurips.cc/paper/2017/file/3f5ee243547dee91fb-d053c1c4a845aa-Abstract.html>
- Microsoft. (2022). Introduction to Visual Basic. <https://docs.microsoft.com/en-us/dotnet/visual-basic/getting-started/>
- Patton, M. Q. (2015). *Qualitative Research & Evaluation Methods: Integrating Theory and Practice* (4th ed.). Thousand Oaks, CA: Sage.
- Sabri, S. (2020). An introduction to VB.NET programming. Towards Data Science. <https://towardsdatascience.com/an-introduction-to-vb-net-programming-506d44d06bdf>
- Microsoft. (2022). What is Visual Basic used for? <https://docs.microsoft.com/en-us/dotnet/visual-basic/fundamentals/what-is-visual-basic-used-for>