A Report

on

“Python Basics for Data Science”
“Cybersecurity Basics”

Field Training

BTES211P

SUBMITTED BY

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(III Semester)

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Certificate

This is to certify that Field Training

"Python Basics for DataScience"

"Cybersecurity Basics"

has been completed by

Mr. Shantanu Potdar
(PRN No. 2046491245042)

of III Semester, Computer Engineering of academic year 2021-22 in partial fulfillment of Field Training (BTES211P) course as prescribed by the Dr. Babasaheb Ambedkar Technological University, Lonere.

Internship Coordinator

Prof. Sheetal Kale
Head of the Department

Place: BIT, Wardha
Date: October 23,2021

Declaration

I, the undersigned declare that this report is personally prepared and compiled by me and that the contents within this report have not been duplicated or published anywhere or submitted to any other university for any degree program by student . I have personally compiled its based on the training, I had complete through edX course.

Report Title:Python Basics for Data Science ; Cybersecurity Basics
Student Name : Shantanu Potdar

Signature: _____

Date: October 23,2021
Place: BIT, Wardha

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Abstract

0.1 Python Basics for Data Science

Python is a widely used high-level, general-purpose, interpreted, dynamic programming language. Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code than would be possible in languages such as C++ or Java. The language provides constructs intended to enable clear programs on both a small and large scale.

0.2 Cybersecurity Basics

Cybersecurity is considered as appropriate means of cyber crime, cyber risk,insurance, and awareness to absorb nancial impact caused by computer security breaches. Since 1st computer incident we have been debating in which way that cyber security can be adapted to match the threats, vulnerabilities and losses by have impact on our world.

Keywords- ***Operations*****,** ***Webscraping*****,** ***Slicing*****,Digital badge , Cryptography**

0.3 Introduction

0.3.1 Python Basics for Data Science

Python for data science, as well as programming in general, with this beginner-friendly introduction to Python. Python is one of the world's most popular programming languages, and there has never been greater demand for professionals with the ability to apply Python fundamentals to drive business solutions across industries. This course will take you from zero to programming in Python in a matter of hours—no prior programming experience necessary!

0.3.2 Cybersecurity Basics

We learn the history of Cybersecurity, types and motives of cyber attacks to further current threats to organizations and individuals. Key terminology, basic system concepts and tools will be examined as an introduction to the Cybersecurity field.

0.4 Objectives

The main objectives of the projects are as follows:

0.4.1 Python Basics for Data Science

- What Python is and why is it useful.
- The application of Python,How to define variables.
- Sets,funtions and conditional statements in Python.
- How to operate on files to read and write data in Python.
- How to use pandas, a must have package for anyone attempting data analysis in Python.

0.4.2 Cybersecurity Basics

- Discuss the evolution of security based on historical events and List various types of malicious software.
- Describe key cybersecurity concepts including the CIA Triad, access management, incident response and common cybersecurity best practices.
- Dentify key cybersecurity tools which include the following: firewall, anti-virus, cryptography, penetration testing and digital forensics.

0.5 Organization of the Report

0.5.1 Python Basics for Data Science

The report is organized as follows:

- Chapter 1 presents the basics of Python and begins by exploring some of the different data types such as integers, real numbers, and strings. Continue with the module and learn how to use expressions in mathematical operations, store values in variables, and the many different ways to manipulate strings.
- Chapter 2 Explains Python data structures by explaining the use of lists and tuples and how they are able to store collections of data in a single variable.Next, learn about dictionaries and how they function by storing data in pairs of keys and values, and end with Python sets to learn how this type of collection can appear in any order and will only contain unique elements.
- Chapter 3 Explains Python fundamentals and begins with the concepts of conditions and branching. Continue through the module and learn how to implement loops to iterate over sequences, create functions to perform a specific task, perform exception handling to catch errors, and how classes are needed to create objects.
- Chapter 4 The basics of working with data in Python and begins the path with learning how to read and write files.Continue the module and uncover the best Python libraries that will aid in data manipulation and mathematical operations.
- Finally, We conclude in Chapter 5 explains delves into the unique ways to collect data by the use of APIs and webscraping. It further explores data collection by explaining how to read and collect data when dealing with different file formats.

0.5.2 Cybersecurity Basics

The report is organized as follows:

- Chapter 1 Explains An introduction to cybersecurity, ideal for learners who are curious about the world of Internet security and who want to be literate in the field.
- Chapter 2 Explains A brief overview of types of actors and their motives.
- Chapter 3 Describe the CIA Triad and what is meant by confidentiality, integrity and availability in terms of cybersecurity and the access management and incident response processes.
- Finally,We conclude in Chapter 4 Describe various cybersecurity frameworks and best practices, including NIST and the other the supporting organizations for each.

Chapter 1

NATURE OF COURSES

1.1 About the Course(s)

1.1.1 Python Basics for Data Science

This course will take you from zero to programming in Python in a matter of hours—no prior programming experience necessary!. Python fundamentals, including data structures and data analysis, complete hands-on exercises throughout the course modules, and create a final project to demonstrate your new skills.

1.1.2 Cybersecurity Basics

This course gives me the background to understand basic Cybersecurity.We will learn the history of Cybersecurity, types and motives of cyber attacks to further your knowledge of current threats to organizations and individuals. Key terminology, basic system concepts and tools will be examined as an introduction to the Cybersecurity field.

1.2 Modules of the Courses

1.2.1 Python Basics for Data Science

- Module 1 - Python Basics.
- Module 2 - Python Data Structures.
- Module 3 - Python Programming Fundamentals.
- Module 4 - Working with Data in Python.
- Module 5 - APIs and Data Collection.

1.2.2 Cybersecurity Basics

- Module 1: History of Cybersecurity.
- Module 2: A brief overview of types of actors and their motives.
- Module 3: An overview of key security concepts.

- Module 4: An overview of key security tools.

1.3 Details of the Course(s)

1.3.1 Python Basics for Data Science

Python is one of the world's most popular programming languages, and there has never been greater demand for professionals with the ability to apply Python fundamentals to drive business solutions across industries.

1.3.2 Cybersecurity Basics

This course is intended for anyone who wants to gain a basic understanding of Cybersecurity or as the first course in a series of courses to acquire the skills to work in the Cybersecurity field as a Cybersecurity Analyst.

Table 1.1: Summary of Courses

SN	Course Name	Course Home Page	Platform	Instructors	Grades
1	Python Basics for Data Science	https://learning.edx.org/course/course-v1:IBM+PY0101EN+2T2021/home	edX	1	82
2	Cyber security Basics	https://learning.edx.org/course/course-v1:IBM+Cybfun.1.0+1T2021/home	edX	1	91

Table 1.2: Duration of courses

SN	Course Name	Start day	End day	Duration (in weeks)
1	Python Basics for Data Science	20/09/2021	11/10/2021	3
2	Cybersecurity Basics	17/09/2021	15/10/2021	4

Chapter 2

SKILLS ACQUIRED DURING THE COURSE

2.1 Skills acquired during Python Basics for Data Science Course

- Base of Python.
- Analytical skills.
- Machine Learning and AI.
- Understanding of Multi-Process Architecture.
- Road to Data Science.
- Good grasp of Web Frameworks.
- Understanding of Multi-Process Architecture.

2.2 Skills acquired during Cybersecurity Basics course

- Problem-Solving Skills.
- Knowledge of Security Across Various Platforms.
- Attention to Detail.
- Communication Skills.
- A Desire to Learn.
- An Understanding of Hacking.

Chapter 3

IMPLEMENTATION & OUTCOMES OF COURSE(S)

3.1 Work Done

3.1.1 Python Basics for Data Science

Week 1:

The basics of Python and begins by exploring some of the different data types such as integers, real numbers, and strings.learn how to use expressions in mathematical operations, store values in variables and the many different ways to manipulate strings.

Tasks:

1. **Task 1**:Practice Quiz: Types
2. **Task 2**:Hands-On Lab: Your First Program, Types, Expressions, and Variables.
3. **Task 3**:Practice Quiz: Expressions and Variables.
4. **Task 4**:Practice Quiz: String Operations.
5. **Task 5**:Graded Quiz: Python Basics.

Week 2:

Python data structures by explaining the use of lists and tuples and how they are able to store collections of data in a single variable.

Next, learn about dictionaries and function by storing data in pairs of keys and values and end with Python sets to learn how this type of collection can appear in any order and will only contain unique elements.

Tasks:

1. **Task 1**:Hands-On Lab: Lists and Tuples.
2. **Task 2**:Practice Quiz: Lists and Tuples.
3. **Task 3**:Hands-On Lab: Dictionaries.

4. **Task 4**:Practice Quiz: Dictionaries.
5. **Task 5**:Hands-On Lab: Sets.
6. **Task 6**:Practice Quiz: Sets.
7. **Task 7**:Graded Quiz: Python Data Structures.

Week 3:

Python fundamentals and begins with the concepts of conditions and branching. Continue through the module and learn how to implement loops to iterate over sequences, create functions to perform a specific task, perform exception handling to catch errors, and how classes are needed to create objects.

Tasks:

1. **Task 1**:Hands-on Lab: Conditions and Branching.
2. **Task 2**:Practice Quiz: Conditions and Branching.
3. **Task 3**:Hands-on Lab: Loops.
4. **Task 4**:Practice Quiz: Loops
5. **Task 5**:Hands-on Lab: Functions
6. **Task 6**:Practice Quiz: Functions.
7. **Task 7**:Hands-On Lab: Exception Handling.
8. **Task 8**:Practice Quiz: Exception Handling.
9. **Task 9**:Hands-on Lab: Objects and Classes.
10. **Task 10**:Practice Quiz: Objects and Classes.
11. **Task 11**: Graded Quiz: Python Programming Fundamentals.

Week 4:

The basics of working with data in Python and begins the path with learning how to read and write files.

Continue to the Python libraries that will aid in data manipulation and mathematical operations.

Tasks:

1. **Task 1**:Hands-On Lab: Reading Files with Open.
2. **Task 2**:Hands-On Lab: Writing Files with Open.
3. **Task 3**:Practice Quiz: Reading Writing Files with Open.
4. **Task 4**:Hands-on Lab: Pandas with IBM Watson Studio.

5. **Task 5**:Practice Quiz: Pandas.
6. **Task 6**:Hands-On Lab: One Dimensional Numpy.
7. **Task 7**:Hands-On Lab: Two Dimensional Numpy.
8. **Task 8**:Practice Quiz: Numpy in Python.
9. **Task 9**:Graded Quiz: Working with Data in Python.

Week 5:

The unique ways to collect data by the use of APIs and webscraping. It further explores data collection by explaining how to read and collect data when dealing with different file formats.

Tasks:

1. **Task 1**:Hands-on Lab: Instruction for Speech to Text and Language Translator API Keys.
2. **Task 2**:Hands-On Lab: Introduction to API.
3. **Task 3**:Hands-On Lab: Watson Speech to Text and Language Translator API.
4. **Task 4**:Practice Quiz: Simple APIs.
5. **Task 4**:Hands-on Lab: Access REST APIs Request HTTP.
6. **Task 4**:Hands-on Lab: Web Scraping.
7. **Task 4**:Hands-on Lab: Working with different file formats.
8. **Task 4**:Practice Quiz: REST APIs, Webscraping, and Working with Files.
9. **Task 4**:Graded Quiz: APIs, and Data Collection.

Final Exam:

- Final Exam (25 Questions).

3.1.2 Cybersecurity Basics

Week 1:

- Define cybersecurity and describe key terms and key security roles and functions within and IT organization.
- Describe the history of cybersecurity and what events brought it into the national spotlight in the United States.
- Describe why critical thinking is such an important skill for the security analyst to possess in the rapidly evolving cyberattack landscape.
- Describe why it is so hard to secure online resources and what organizations and resources are available to help.

Tasks:

1. **Task 1**:Cybersecurity Programs.
2. **Task 2**:Cybersecurity - A Security Architect's Perspective.
3. **Task 3**:What is Critical Thinking?
4. **Task 4**:Graded Quiz: History of Cybersecurity .

Week 2:

A brief overview of types of actors and their motives.

Tasks:

1. **Task 1**:Types of actors and their motives.
2. **Task 2**:An Architect's perspective on attack classifications.
3. **Task 3**:Malware and an introduction to threat protection.
4. **Task 4**:Attacks and Cyber Crime Resources.
5. **Task 5**:Graded Quiz: A brief overview of types of actors and their motives.

Week 3:

- Describe the CIA Triad and what is meant by confidentiality, integrity and availability in terms of cybersecurity.
- Describe the access management and incident response processes.

Tasks:

1. **Task 1**:CIA Triad.
2. **Task 2**:Access Management, Completed.
3. **Task 3**:Incident Response.
4. **Task 4**:Frameworks and their purpose.
5. **Task 5**:Graded Quiz: An overview of key security concepts.

Week 4:

Describe various cybersecurity frameworks and best practices, including NIST and the other the supporting organizations for each.

Tasks;

1. **Task 1**:Firewalls.
2. **Task 2**:Antivirus/Antimalware.
3. **Task 3**:Introduction to Cryptography.
4. **Task 4**:First look at Penetration Testing and Digital Forensics.
5. **Task 5**:Graded Quiz: An overview of key security tools.

3.2 Course Impact

3.2.1 Python Basics for Data Science

- Easy to Learn Understand.
- Python's Popularity High Salary.
- Open-Source Language.
- Receives Regular Updates.
- Low Program Management.
- Extensive Support Libraries.
- Increased Productivity.

3.2.2 Cybersecurity Basics

- Cybersecurity – An Evergreen Industry
- Travel the World With Cybersecurity
- A Career that Serves the Greater Good
- A Chance to Work with Secret Agencies
- No Math!
- Unlimited Potential for Growth
- Plenty of Opportunities
- A Variety of Industries to Choose
- A Job that Never Gets Boring
- Fat Pay Cheques

3.3 Screenshots

Figure 3.1: Python Basics for Data Science

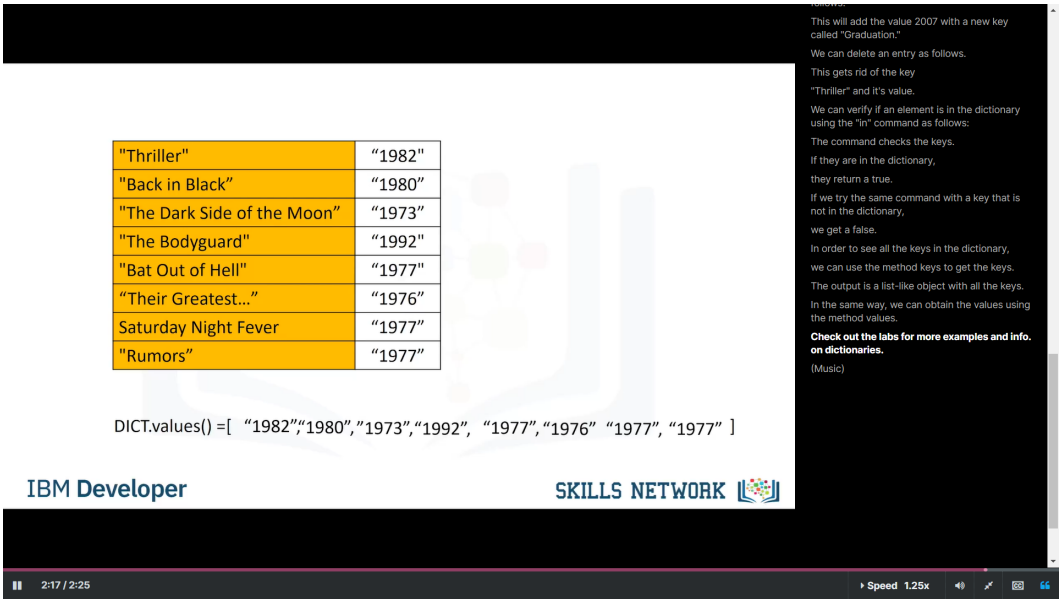


Figure 3.2: Python Basics for Data Science

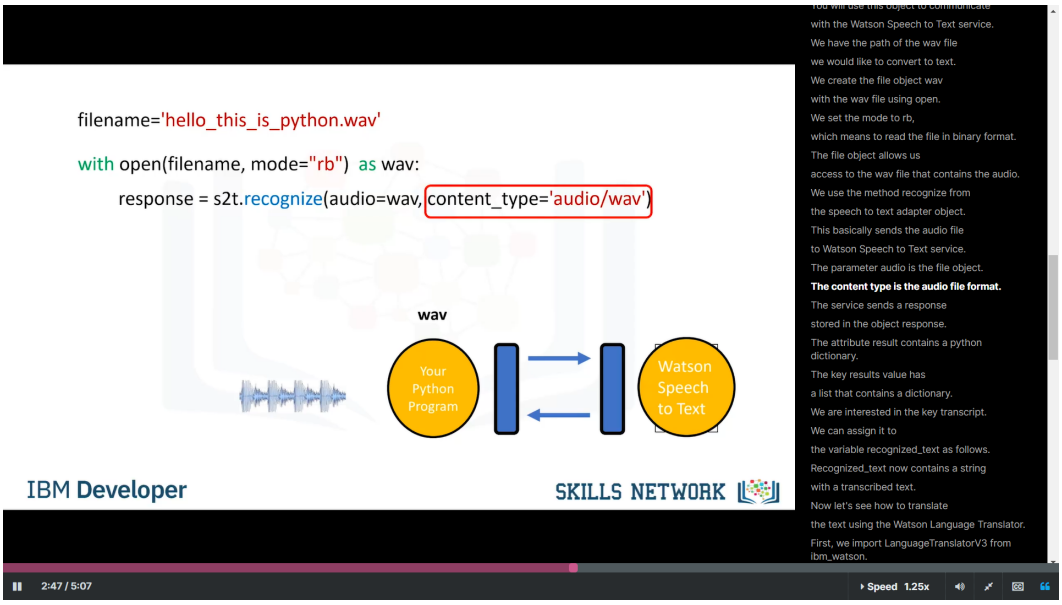


Figure 3.3: Cybersecurity Basics

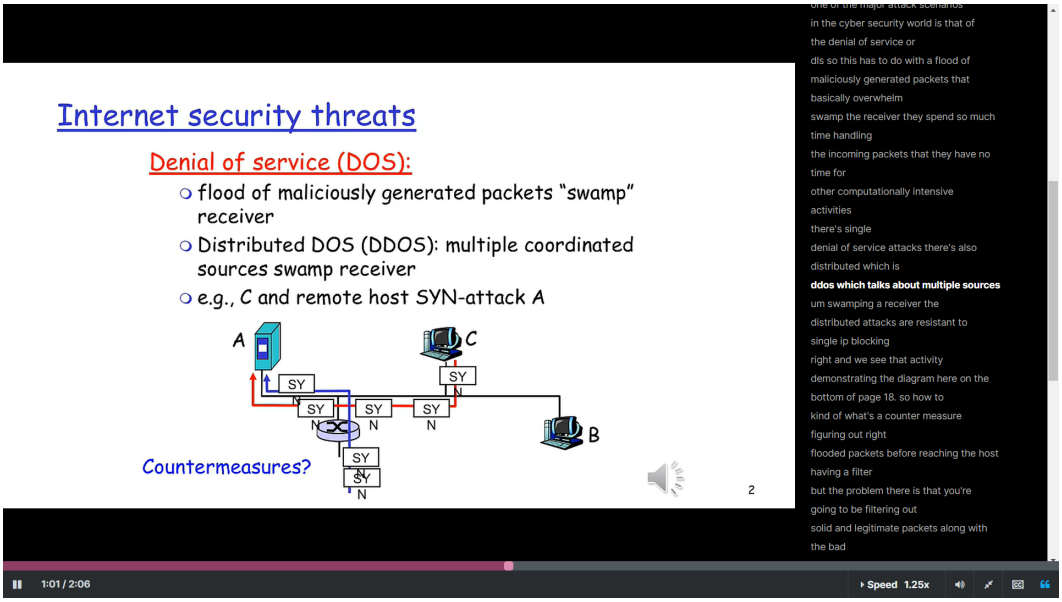
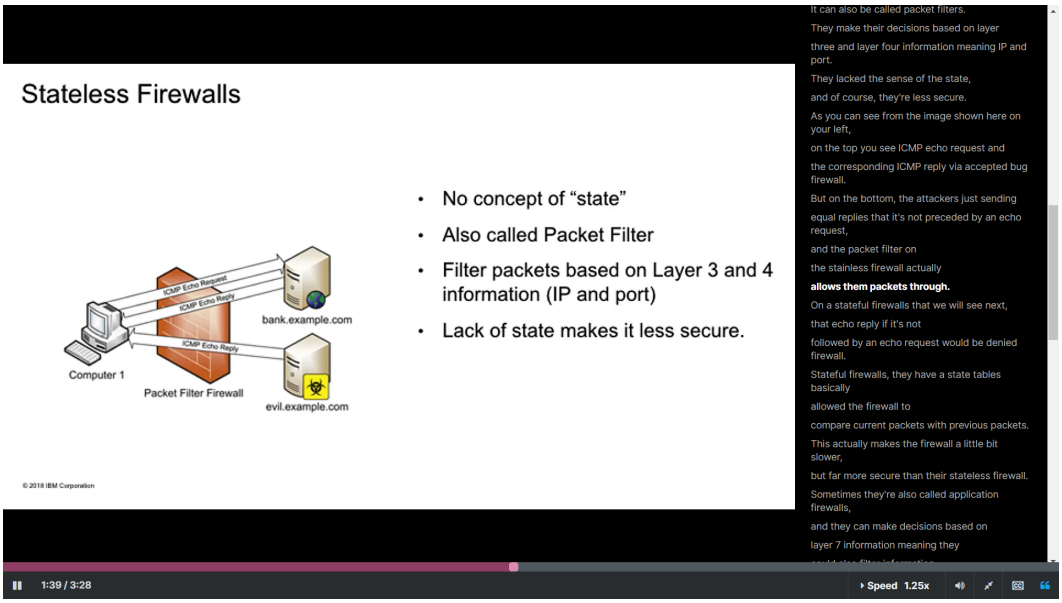


Figure 3.4: Cybersecurity Basics



Chapter 4

CONCLUSION

4.1 Conclusion

4.1.1 Python Basics for Data Science

- Understanding the syntax of Python is easy and Python by itself is indeed a great language.
- There are plenty of fun-to-write python language.

4.1.2 Cybersecurity Basics

- Cyber security is one of the most important aspects of the fast-paced growing digital world.
- The threats of it are hard to deny, so it is crucial to learn how to defend from them and teach others how to do it too.

4.1.3 Learning Outcomes

4.1.4 Python Basics for Data Science

- Define and demonstrate the use of built-in data structures lists and dictionary.
- Design and implement a program to solve a real world problem.
- Design and implement GUI application and how to handle exceptions and files.
- Make database connectivity in python programming language.

4.1.5 Cybersecurity Basics

- History of Cybersecurity Basics.
- Analyze and resolve security issues in networks and computer systems to secure an IT infrastructure.
- Design and develop, test and evaluate secure software. Develop policies and procedures to manage enterprise security risks.

4.2 Future Plan

4.2.1 Python Basics for Data Science

- Software Engineer.
- Python Developer.
- Software Developer.

4.2.2 Cybersecurity Basics

- Network Security Engineer.
- Cyber Security Manager.

References

[1] Python
https://www.python.org/

[2] IBM
https://www.ibm.com/topics/cybersecurity

Appendix A

Certificates

Figure A.1: Certificate of Python Basics for Data Science

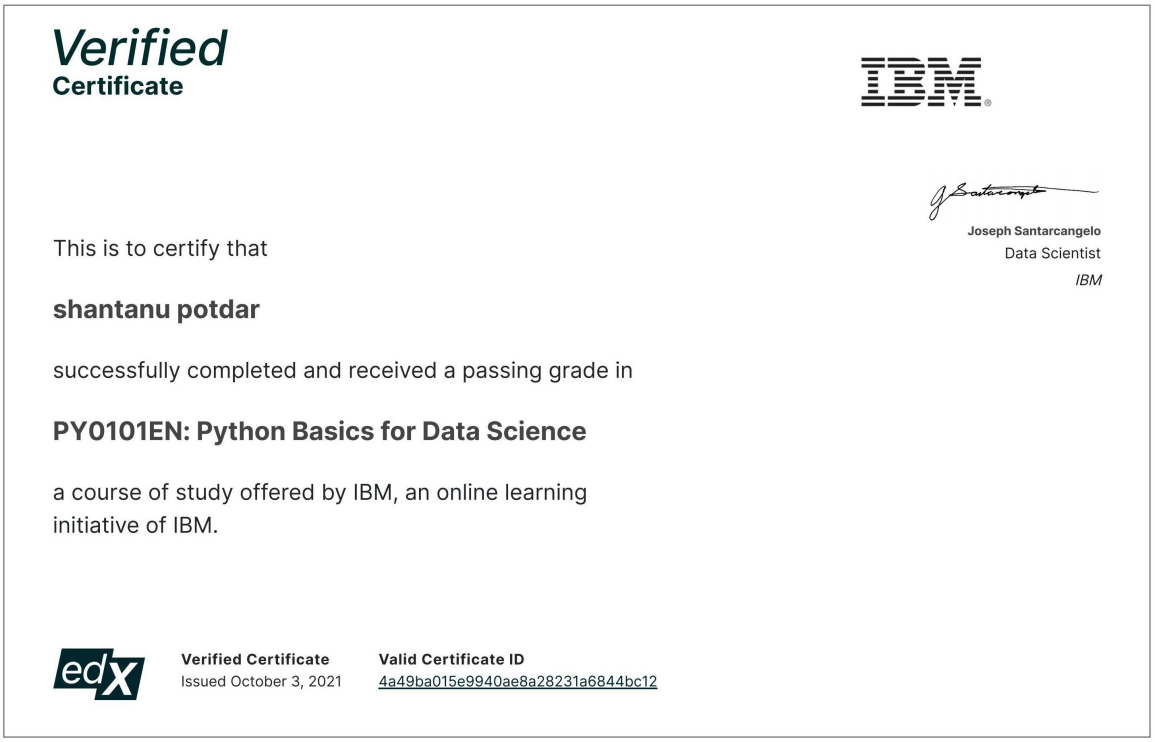


Figure A.2: Certificate of Cybersecurity Basics