Unit 4 – Lesson 1:

Innovations in Programming

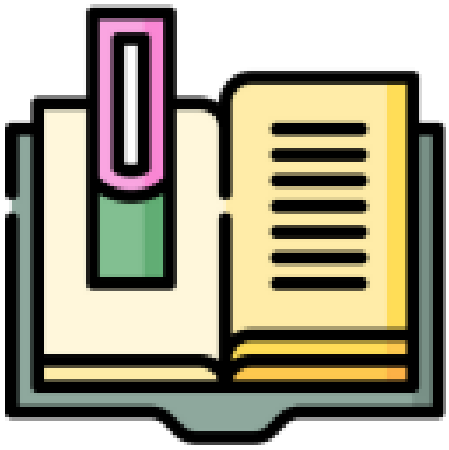
Lesson 1: Innovations in Programming

Time available: 4 hours

Lesson programmation:

1.Explain the technology idiom of the day.
2.Before the reading activity, explain what reading in context is.
3.Socialize key vocabulary.
4.Reading: The Future of Programming Languages: Trends and Innovations.
5.Answer the multiple-choice questions.
6.True/False questions.
7.Socialize vocabulary about reading "Your brain and coding".
8.Reading: "Your brain and coding"
9.Matching activity based on the previous reading.
10.Fill – in the gap activity about the reading "Your brain and coding"..

Learning materials



- Readings

TIC

Lesson 1: Innovations in Programming

1-Idiom of the day:

- **Tech-savvy:** This adjective is used to describe people who are knowledgeable and skilled in using technology effectively.

"The tech-savvy team quickly adapted to the new software tools."

2- Learn what the Reading in Context means:

Reading in context refers to understanding the meaning of words or phrases not just by their direct definition, but by how they are used in a sentence or larger piece of text. It involves interpreting meaning based on the surrounding words, sentences, or paragraphs, as well as the overall theme or purpose of the text. This technique is crucial for fully grasping nuances, idiomatic expressions, and subtle tones in a piece of writing.

Strategies for Reading in Context:

Look at Surrounding Sentences: Often, the sentences before and after a word or phrase provide clues to its meaning. Pay attention to how the word is used in the overall passage.

- **Identify the Tone and Purpose:** Understanding the tone (e.g., formal, informal, humorous, serious) and the author's purpose can provide insights into the meaning of words or phrases.
- **Use Your Background Knowledge:** Apply what you already know about the subject matter to help understand new concepts or vocabulary.
- **Identify Signal Words:** Words like "however","therefore", and "in contrast" can signal relationships between ideas and help clarify meaning.
- **Look for Examples or Explanations:** Authors often provide examples or further explanations that can clarify the meaning of a word or phrase.
- **Make Inferences:** Sometimes you may need to read between the lines and make educated guesses based on the information provided.
- **Check for Definitions in the Text:** Especially in academic texts, authors might define a term when it first appears.
- **Read Aloud:** Hearing the text can sometimes make the context and its cues clearer.dbreaking discoveries kept the company ahead of the curve."

Implementation in Reading:

1.Fiction and Literature: Understand characters' motivations and plot subtleties.

2.Academic Texts: Grasp complex theories or concepts that are explained through examples and extended discussion.

3.News Articles: Understand the implications of events or statements in their broader social or political context.

4.Technical Documents: Comprehend how specific terms are used within the field.

3- Before the reading, socialize the following key vocabulary:

Key Vocabulary

- **Technology (n):** Tools and machines used for solving problems or doing new things.
- **Programming Languages (n):** Special languages used to write instructions for computers.
- **Software Developers (n):** People who create computer programs.
- **Dynamic (adj):** Constantly changing or moving.
- **Artificial Intelligence (AI) (n):** A type of computer technology that makes machines think like humans.
- **Machine Learning (ML) (n):** A way of teaching computers to learn from data.
- **Python (n)**: A programming language known for its simplicity.
- **Libraries (n):** Collections of pre-written code that programmers can use.
- **Security (n):** Protecting information or systems from danger or theft.

- **Rust (n):** A programming language known for being safe and fast.
- **Concurrency (n):** Doing many things at the same time, used in computing.
- **Cloud Computing (n):** Storing and accessing data over the internet instead of your computer's hard drive.
- **Internet of Things (IoT) (n):** Network of physical devices that are connected to the internet.
- **Big Data (n):** Very large sets of data that are analyzed by computers.
- **Natural Language Processing (NLP) (n):** Technology that helps computers understand human language.

4- Reading The Future of Programming Languages: Trends and Innovations

5- Multiple Choice Vocabulary: For each statement, choose the option that best matches the meaning of the word as used in the context of the reading passage.

1. Innovations
a) New methods, ideas, or products
b) Traditional ways of doing things
c) Problems in technology

2. Ubiquitous
a) Unique and rare
b) Found everywhere; widespread
c) Outdated and old

3. Dynamic Typing
a) The physical act of typing on a keyboard
b) A feature in programming where the type of a variable can change
c) A programming language that is difficult to learn

4. Statistical Modeling
a) A way of predicting future trends
b) Using mathematical models in programming
c) Building physical models of computers

5. Parallelism

a) Working on a single task at one time

b) The ability to run multiple processes simultaneously

c) A type of computer error

6. Scalable Systems

a) Systems that cannot be changed

b) Systems that can handle increasing amounts of work

c) Systems used only in schools

7. Eco-friendly

a) Related to economic benefits

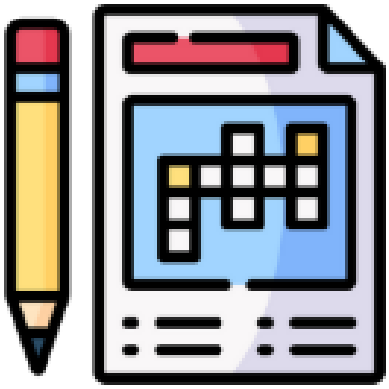
b) Something that is not harmful to the environment

c) A new technology gadget

6- True/False Activity: Read the following statements carefully. For each statement, decide whether it is true or false based on the text.

- Python is currently leading in the development of AI and Machine
- Learning models due to its libraries like TensorFlow and PyTorch. _____
- Rust is becoming popular for IoT applications mainly because of its integrated garbage collector. _____
- Languages like Scala are becoming important in big data processing due to their efficiency in handling large datasets. _____
- Haskell is known for its energy-efficient programming, which contributes to sustainable coding practices. _____
- Go is designed with built-in concurrency mechanisms, making it unsuitable for distributed computing environments. _____

- The rise of cloud computing has decreased the importance of language features that support distributed system design. _____



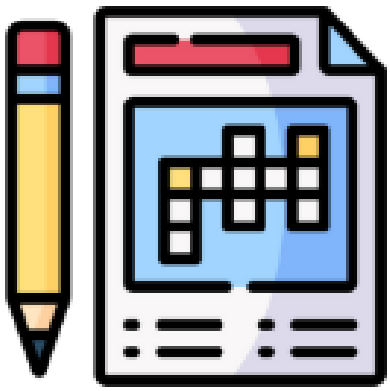
7- Socialize the following vocabulary with the students:

Relevant Vocabulary:

- **fMRI:** A machine that shows blood flow in the brain. (Synonym: Brain Scanner)
- **Programming:** Writing instructions for computers. (Synonym: Coding)
- **Researcher:** A person who studies something carefully. (Synonym: Scientist)
- **Dynamic Analysis:** Understanding parts of code that change. (Synonym:Code Analysis)
- **Machine Learning:** A type of computer program that improves with experience. (Synonym: AI Learning)
- **Neuroscience:** The study of the brain and nerves. (Synonym: Brain Science)
- **Collaboration:** Working together with others. (Synonym: Teamwork

6- True/False Activity: Read the following statements carefully. For each statement, decide whether it is true or false based on the text.

- Python is currently leading in the development of AI and Machine Learning models due to its libraries like TensorFlow and PyTorch. _____
- Rust is becoming popular for IoT applications mainly because of its integrated garbage collector. _____
- Languages like Scala are becoming important in big data processing due to their efficiency in handling large datasets. _____
- Haskell is known for its energy-efficient programming, which contributes to sustainable coding practices. _____
- Go is designed with built-in concurrency mechanisms, making it unsuitable for distributed computing environments. _____
- Security is now a critical aspect of programming languages, with many incorporating features to prevent common security flaws. _____
- The rise of cloud computing has decreased the importance of language features that support distributed system design. _____



7- Socialize the following vocabulary with the students:

Relevant Vocabulary:

- fMRI: A machine that shows blood flow in the brain. (Synonym: Brain Scanner)
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8- Reading Your Brain and Coding

9- Match each heading with the correct paragraph. There are two headings
that you do not need.

Headings:

- The Role of fMRI in Brain Studies _____
- Understanding Dynamic Coding Analysis _____
- The Future of Brain Research in Coding _____

- The Purpose of Coding _____
- How Machine Learning Relates to Brain Studies _____
- The Importance of Teamwork in Research _____
- Brain Responses to Different Coding Tasks _____
- The Use of fMRI in Other Fields _____

Paragraphs:

A. This part talks about a machine used to see blood flow in the brain during different activities, like coding. It helps to understand which parts of the brain are active.
B. Here, the text describes how researchers are looking at the brain's reaction to various coding tasks, such as loops and branches in code.
C. This section discusses the study of changes in code and how the reasoning part of the brain is more involved in this than the language part.
D. The paragraph focuses on the future research goals of the team. They want to learn more about how the brain handles complex tasks like planning
or writing music.
E.This part is about using machine learning models to understand brain activity related to coding. The patterns seen in the brain are similar to those in these models.
F.Here, the importance of researchers from different fields working together to understand coding and the brain is highlighted.

10- Fill the Gap Activity: Fill in the gaps in the following sentences based on the adapted text "Your Brain and Coding." Choose the correct word from the brackets to complete each sentence.

- MIT researchers are studying how the brain works when people write or _____ computer code. **(understand / play / use.**
- A special machine called an _____ is used to see which parts of the brain are active during coding. **(fMRI / computer / telescope)**
- This machine helps to understand which parts of the brain are used for different _____, like solving math problems or learning languages. **(activities / songs / games)**
- The team found that understanding code uses parts of the brain that are for _____ and problem-solving. **(running / reasoning / eating)**
- Researchers look at how individual brains react to different coding tasks, like word manipulation or _____ operations. **(math / art / music)**
- Machine learning models are used to understand how the _____ works with code. **(brain / car / phone)**
- The future research goals include understanding how the brain handles _____ tasks like planning or writing music. **(complex / easy / funny)**