UNIT 17
PROGRAMMING LANGUAGES

Objectives: at the end of the lesson, students will be able to:

1. speak about various types of programming languages;
2. analyze different programming languages;
3. create a presentation that illustrates the features of the various programming languages currently in use.

Lead-in: Look at the pictures and figure out the theme of today's topic.

Let's Talk!

1. What programming languages are currently available?
2. How are new programming languages developed?

Vocabulary Building

Key Terms

Assembler – is a low-level programming language that translates between computer programs

Example: *Assembler is less computer orientated than machine code.*

Java – is an object-oriented programming language

Example: *He has a passion for digital preservation, having previously worked on projects like conserving old-school mobile games that ran on Java.*

C++ - is a programming language that adds object-oriented programming capabilities to C

Example: *In C++ we have to tell the compiler about the data type we are going to enter.*

BASIC – it is a high-level programming language that was invented in the 1960s and is declining in popularity

Example: *The Basic programming language is not closely related to any special type of computer, processor or operating system. It is a general-purpose language.*

C# - is a programming language that was invented as an alternative to Java

Example: *C# (C-Sharp) is a programming language developed by Microsoft that runs on the .NET Framework. C# is used to develop web apps, desktop apps, mobile apps, games.*

Multi-thread – is to use a computer to execute several threads of execution simultaneously

Example: *Multi-threaded programs utilize multiple threads to handle tasks concurrently, potentially improving performance and responsiveness.*

Machine code – is made up of the instructions that a CPU can process

Example: *In computer programming, machine code is computer code consisting of machine language instructions, which are used to control a computer's central processing unit (CPU).*

Compiler – changes human-readable source code into machine code that a CPU can understand

Example: *A compiler is a software that converts the source code to the object code. In other words, we can say that it converts the high-level language to machine/binary language.*

Linkers – take the machine code created by a compiler and make it into an executable file

Example: *In computing, a linker or link editor is a computer system program that takes one or more object files (generated by a compiler or an assembler) and combines them into a single executable file, library file, or another "object" file.*

CPU – (Central Processing Unit) is the part of a computer that handles most of the processing of files and data

Example: *The Central Processing Unit (CPU) is the primary component of a computer that acts as its "control center." The CPU,*

also referred to as the "central" or "main" processor, is a complex set of electronic circuitry that runs the machine's operating system and apps.

Activity: Choose the sentence that uses the underlined parts correctly.

1.

A. Linkers allow programmers to control computers.

B.CPU was the first programming language.

2. **A**. A new Java can make your computer run faster.

B. Machine code makes programming possible.

3. **A**. Added memory allows computers to multi-thread.

B. I'm learning compiler, a new programming language.

Activity: Watch a video about types of programming languages and answer the following questions.

https://youtu.be/aYjGXzktatA?si=toCVmgfBzvhfX7f1

1. What types of programming languages were mentioned in this video?
2. What is the most famous programming language?
3. What are the high- and low-level languages?

Reading

Mr. Daniels,

As the head of the computer programming department, I feel that we need to update the department's resources. This includes our programmers. Most of our programmers are comfortable with the C, C++, and Java computer languages. We even have one programmer who can use C#. But we don't have anyone proficient in Assembler. I think we need some programmers who are familiar with it. This way, we can translate between programs more easily.

In addition, we have two programmers who specialize in BASIC. This language is in decline and will probably be phased out soon.

Some of our machines are getting older, too. A few computers need their compilers and linkers updated. Otherwise, they'll never be

able to convert to machine code. Efficiently. One of our older CPUs cannot multi-thread very well. As you know, the programming department is very important to this company's future. Please help us stay updated.

Thanks,

Sarah Jennings

Activity: Read the e-mail to Mr. Daniel from S. Jennings and answer the questions.

1. Who is the author of the message?

A) Mr. Daniels

B) Sarah Jennings

C) A programmer

D) The head of the computer programming department

2. What is the primary concern of Sarah Jennings in the message?

A) Updating the department's resources

B) Hiring new programmers

C) Learning new programming languages

D) Increasing the department's budget

3. Which programming languages are most of the current programmers comfortable with?

A) Python, Ruby, and JavaScript

B) C, C++, and Java

C) Assembler and BASIC

D) HTML and CSS

4. How many programmers specialize in BASIC?

A) None

B) One

C) Two

D) Three

5. What is the reason Sarah Jennings gives for needing programmers who are proficient in Assembler?

A) To update old machines

B) To translate between programs more easily

C) To replace the BASIC programmers

D) To improve the multi-threading capabilities

6. What issue is mentioned about some of the older computers in the department?

A) They are too new and need downgrading.

B) They need their compilers and linkers updated.

C) They have too much RAM.

D) They are too fast for the current software.

7. What limitation does one of the older CPUs have according to the message?

A) It cannot handle large data sets.

B) It cannot multi-thread very well.

C) It has too much storage.

D) It cannot connect to the internet.

8. What does Sarah Jennings suggest is crucial for the company's future?

A) Marketing strategies

B) The programming department

C) New hardware purchases

D) Expanding into new markets

9. What action does Sarah Jennings request from Mr. Daniels?

A) To evaluate the department's software needs

B) To help the department stay updated

C) To review the programmers' salaries

D) To introduce new programming languages

10. What is the general tone of Sarah Jennings' message?

A) Critical and demanding

B) Informative and constructive

C) Casual and informal

D) Apologetic and hesitant

Group Work Activity: Prepare a short presentation

In a group of 4-5 members, students will be assigned a different programming language to work with (Python, Java, C++, C#, C, and BASIC) and make a short presentation. They should discuss the ease of implementation, the challenges faced, and how the language's features affected their development process.

Home assignment

Students need to write a reflection on what they learned from the activity including their insights and any surprising findings.