UNIT-3
Team activity: Discussion
Team Discussion: What is a Secure Programming Language?

What factors determine whether a programming language is secure or not?

The appropriate choice of programming language produces solutions that are clear, simple to extend, simple to describe, and Secure. (Pillai, 2017)

The following are the security factors to be considered:

- Targeted platform
- Secure coding
- Information security architecture
- structure, system, and environment of stakeholder
- Whitebox/BlackBox testing
- Ethics and confidentiality

Could Python be classed as a secure language? Justify your answer.

Python is slow:

Since Python is not a compiled language, programmes written in it will execute more slowly simply because they must first be interpreted, as opposed to C, which produces programmes that can be performed immediately. This is just a drawback in a small number of circumstances. This truly isn't a problem for programs with general purposes.

Python prohibits direct manipulation of computer memory:

This is also not an issue if the software we are writing does not require it. If we are programming a chip or a driver for a device, we need extremely little access to the computer's fundamental architecture. However, if we are running some calculations, creating a website, or developing a graphical user interface, we do not require such access. In reality, such power could lead to buffer overflows and memory leaks.

Python would be a better language to create operating systems than C. Discuss.

In C language we observe the following lowlights: Program syntax is harder than Python, and error debugging is difficult as it is a compiler-dependent language. This means that it takes the entire source code, compiles it and then shows all the errors and the Programmer has to do memory management on their own. Whereas in Python, It is easier to write code in Python as the number of lines is less comparatively, Error debugging is simple. This means it takes only one instruction at a time and compiles and executes simultaneously. Errors are shown instantly, and the execution is stopped, at that instruction, and Python uses an automatic garbage collector for memory management.

References:

Pillai, Anand Balachandran. Software architecture with python. Packt Publishing Ltd, 2017.
Cifuentes, Cristina, and Gavin Bierman. "What is a Secure Programming Language?." In 3rd Summit on Advances in Programming Languages (SNAPL 2019). Schloss Dagstuhl-Leibniz-Zentrum fuer Informatik, 2019.