**COMPUTER PROGRAMMING**

Computer programs are developed by computer programmers or software engineers. Computer programming encompasses a broad set of activities that include planning, coding, testing, and documenting.

The programming process begins with a problem statement that helps you clearly define the purpose of a computer program. In the context of programming, a problem statement defines certain elements that must be manipulated to achieve a result or goal.

**Programming Paradigms.** The phrase programming paradigm refers to a way of conceptualizing and structuring the tasks a computer performs. Today’s most popular programming paradigms are:

Event-driven - Focuses on selecting user interface elements and defining event-handling routines that are triggered by various mouse or keyboard activities.

Procedural - Emphasizes linear steps that provide the computer with instructions on how to solve a problem or carry out a task.

Object-oriented - Formulate programs as a series of objects and methods that interact to perform a specific task.

Declarative - Focuses on the use of facts and rules to describe a problem.

**Secure Programming.** Software security begins when program specifications are formulated. Techniques such as formal methods, threat modeling, attack trees, and defensive programming help programmers remain aware of security throughout the software development life cycle.

Formal methods help programmers apply logical and mathematical models to software design, coding, testing, and verification. Formal methods tend to be used only for life critical systems, such as air traffic control and nuclear reactor control systems.

Threat modeling is a technique that can be used to identify potential vulnerabilities by listing the key assets of an application, categorizing the threats to each asset, and developing threat mitigation strategies that can be implemented during coding.

When software bugs are discovered, the programmer’s remaining line of defense is to produce a bug fix, or patch.

**Conclusion**. Computer programming is closely integrated into our lives and is responsible for the development of many branches of our lives now. The most important trend in programming for the next decade will be using machine learning and artificial intelligence to automate much of coding. AI and machine-based learning can automate coding and help programmers write faster and better code.