4-2 Milestone Three: Algorithms and Data Structure

The artifact that I have taken is “Security Policy” created for Green Pace as part of the “CS 405: Secure Coding” course. The security policy contains “Core Security Principles” and “Coding Standards” to develop the software uniformly and securely. I have selected this artifact since it is missing secure coding standards for C++ data structures. Data structure is a complex data type and lack of compliance to secure coding standards could result an unexpected behavior and/or security leak. I have added following three secure coding standards to be followed when dealing with arrays and pointers data structure.

1) **Do not use pointer arithmetic on polymorphic objects**
2) **Always initialize pointers values to nullptr**
3) **Pair the memory allocate and deallocate functions correctly.**

For each coding standard, I have added the description of coding standard, non-compliant code and compliant code examples, Threat level if not followed and automation tools available to detect the vulnerability etc. My data structure skills are demonstrated in developing the above three C++ secure coding standards which can be found in the pages from 36 to 41 of the artifact. Data structures are commonly used to develop the software by programmers and now, with the inclusion of above-mentioned secure coding standards, the security policy is comprehensive and can lead to consistent software development.

Based on the module one feedback, I have selected two more secure coding standards – “Always initialize pointers values to nullptr” and “Pair the memory allocates and deallocate functions correctly”. For each secure coding standard, added a compliance and non-compliance code example in addition to severity and threat levels etc.

Green Pace security policy template was created as part of my last term course. Though it was completed as part of my recent term but this course makes me feel as complex subject considering the security aspects and practices. In addition to it, data structures especially arrays and pointers are also complex in nature. Hence understanding and adding three new security standards required me to take a stretch and spend additional effort. Through this exercise, I have gained much more knowledge on the secured standards followed for data structures.

References:

https://github.com/apyneni1/eportfolio/blob/a757987cff2220bbb76ae319aa0331540909a3ec/4.2%20Security%20Policy.pdf