Faculty of Science, Engineering and Technology

Introduction to Programming

Distinction Task 8.3: Food Hunter

Principles question and answer sheet.

Write up to one page (maximum 500 words) addressing the following question:

During this course we have covered some design principles for programming. These include:

- Coupling
- Cohesion
- Information hiding
- Modular design

Among others.

Compare and contrast how at least two (2) of the structured programming principles we have covered relate to theory and practice of object oriented programming. i.e what are the similarities and/or differences between structured programming and object oriented programming in relation to at least 2 design principles,

Answer:

Object Oriented Programming (OOP) when compared to purely functional programming comes with a variety of comparisons. The use of objects and classes make for tidy packages of code that can help shape the way in which data is collected and manipulated. This concept is related to OOP and not functional. Classes have many advantages, one being their ability to “hide” information from the rest of the program. This enables programmers to segregate key values. Resulting in a more secure program that is less susceptible to conflicts arising from conflicting variables.

Whilst Structured programming results in data being loosely coupled to many different procedures. OOP on the other hand, consists of software modules referred to as objects. These modules both encapsulate all relevant data, as well as segregate the inner complexities from the program (Asagba and Ogheneovo, 2008) This also contributes to the idea of modular programming. This concept involves sub-dividing a program into smaller units that can be integrated to work towards a common objective. (Abott, 1983)

Coupling refers to how dependent procedures are to each other. A program with low coupling will enable alterations in the code with minimal impact on the rest of the program. Low coupling will often correlate with high cohesion. Cohesion being how closely related elements within a module are. In contrast to this. Functional programming is based more around functions with a high degree of coupling. With data being passed from one block of code to the next to accomplish a desired task. This high degree of coupling usually correlates to a low degree of cohesion. This transparent approach to data manipulation also leads to low levels of information hiding and modularity between components. This can lead to vulnerabilities within the code however can avoid programs competing for the same variable if poorly designed. (Low Coupling, High Cohesion, 2020)

Asagba P. and Ogheneovo. E., 2008 A Comparative Analysis of Structured and Object-Oriented Programming Methods. Journal of Applied Sciences and Environmental Management 12(4).

Abbott, R., 1983. Program design by informal English Descriptions. Communications of the ACM, 26(11), pp.882-894

Medium. 2020. Low Coupling, High Cohesion. [online] Available at: https://medium.com/clarityhub.low-coupling-high-cohesion-3610e35ac4a6 [Accessed 28 may 2020].

End of Task.