**HOMEWORK WEEK 3**

This week’s homework is a research based one. You’ll need to conduct independent learning, in combination with existing material (where available), to answer the questions below. The reason for this homework is to ensure you are aware of critical topics in CS. These topics were difficult to cover within the existing lesson schedules, but due to their importance are placed within the homework instead. Make sure to research, learn and then answer the following:

1. What is OOP? How have you already made use of it (e.g. class components)?
   1. *Feel free to give a fairly light answer here - as you’ll need to do the deep-part / actual meat in the following questions when you cover each of OOP’s pillars*

Object Orientated Programming is way of structuring software design around objects or data and actions in the form of methods or functions. Objects are units of code which have distinctive attributes and they allow you to store data of all types together (which can be expressed as variables) and let you define and store functions. This also means that real world objects can be represented though code such as a robot or computer. An example of an object is a laptop screen where the attributes can be size or resolution and the functions can be to alter the brightness or to switch it on and off.

A class differs from an object, as a class is like a blueprint or a holder that defines the methods and properties of an object but it does not possess any data within whereas an object is a specific version of a class with the extra information/data such as what the methods will return and also the values of the properties.

Class components in JS are have three features. Constuctor, methods and functions

1. What is Polymorphism?

Polymorphism is a feature of a programming language that uses routines to make use of variables of a variety of types at different times.

1. What is Abstraction?

First patterns are identified in problems, abstraction is used to gather the general characteristics and to filter out the details that are not required to solve the problem

1. What is Inheritance?
2. What is encapsulation?

Encapsulation looks to hide the complexity of the inner workings of an object from the progammers. This is done by bundling related data and behaviour and limit data scope. Keeping the data and behaviour together makes it easier for programmers to make sense of the data and behaviour involved in the object , but it also prevents code outside the object from seeing how it works and modifying it in undesirable ways. Objects are encapsulated within their own entity and can choose how it wants to interact with other code and what aspects of its behaviour it wants to be public . Without it , you would still need to keep track of the data and behaviour related to each object but it would be spread out throughout your program, and when there are multiple instances of that object this could become very complex and confusing. Encapsulation makes sure that the data and behaviour which need to be kept together stay together and therefore makes it easier for them to be used by other parts of our code.

1. What is:
   1. Agile development?

Agile development is an iterative way to encourage a product management team to work on a project in different stages simultaneously. The model, development and testing are all done simultaneously and allow more communication between the developers, managers, testers and stakeholders. The product is delivered in a way where the client can see parts of the project rather than the complete launch of the project. For the iterations, client feedback is used to development of the product and guarantee client satisfaction.

* 1. Waterfall development?

Is a software development methodology where a more linear method is used by dividing the SDLC into stages like analysis, implementation and so forth. It is a method where things must be conducted in chronological order where one stage must be completed before moving onto the subsequent stage. For each stage, clear documentation must be updated and the product is presented to the client once it is completed.

* 1. How do they differ? Which is suited for which situation?

Waterfall development does not entail customer interaction during the process, which may result in huge customer dissatisfaction as the product management team is not entirely aware of what the customer wants and so may produce results which differ to the general opinion of the target audience customers. Although with agile, the customers are always notified during each incremental presentation and this helps with project development as there is more of a chance of meeting the customer’s wants and guaranteeing that satisfaction. Agile ensures iterations are much quicker and waterfall looks at the completeness of the entire project. Agile also looks at customer

Once complete, please return to your instructor your answers! Remember:

* Justify and be critical of everything! This distinguishes a great answer from a good answer
* Analyse - why does x even exist? Who needs it or uses it? Who is it important to, what’s the point of it at all?