AQA Computer Science A-Level
3.1.2 Procedural-oriented programming
Concise Notes

Specification:

3.1.2.1 Structured programming:

Understand the structured approach to program design and construction

Be able to construct and use hierarchy charts when designing programs

Be able to explain the advantages of the structured approach

The procedural programming paradigm

- Programs written in the procedural programming paradigm are formed from sequences of instructions
- Instructions are executed in the order in which they appear in the program code
- Procedures like functions and subroutines form parts of the program
- Procedures can can be called from anywhere within the program, by other procedures or by themselves recursively
- Data is stored in procedural programs by constants and variables
- A data structure is said to have a global scope if it can be accessed from all parts of the program
- A data structure that is only accessible from the structure within which it is declared is said to have local scope

The structured approach
- Using the structured approach to program design and construction keeps programs easy to understand and manage
- Four basic structures are used:
  - Assignment
  - Sequence
  - Selection
  - Iteration
- Structured programs are said to be designed from the top down
- The most important elements of a problem are broken down into smaller tasks, each of which can be solved in a block of code such as a procedure or module
- These procedures and modules go on to form part of the overall solution

Advantages of the structured approach
- Navigation of different elements of the overall solution is improved which makes maintaining the program easier
- Testing can be carried out on the individual modules before they are combined to form the overall solution
- Development can be split over a team of developers each of which is assigned a different module to work on

Hierarchy charts
- Graphically represent the structure of a structured program
- Each procedure is displayed as a rectangle which is connected to any other procedures that are used within it
- Each rectangle in the hierarchy chart represents a procedure in the program
- Lines between the rectangles show the relationships that exist between the different procedures