

Algorithm Designs

1.) Flowcharts

EXAMPLE

? What are 'Flowcharts'?

Flowcharts are a graphical representation of how a software program will operate.

They are used to plan out how the problem will be solved (the sequences of instructions needed) before any code is written.

Flowcharts use specific shapes to represent different things

Shape	What's it for?	notes	Examples
Start/Stop	<ul style="list-style-type: none"> - Begin a flowchart - End a flowchart 	A flowchart <u>can</u> have: Only one 'Start', Multiple 'Stops'	Start Stop
Process	<ul style="list-style-type: none"> - Setting the value of variables - Changing the value of variables - Performing calculations 		num = 1 num = num + 1 Area = Height * Width
Decision	<ul style="list-style-type: none"> - To make decisions/selections - To check the value of variables - IF & ELIF statements - Controlling loops (for & while) 	Must contain a question with a 'yes' or 'no' answer	Lives = 0? Counter (i) = 9? Choice = "a"?
Input Output	<ul style="list-style-type: none"> - The user entering information (e.g. button clicks/keyboard) - Displaying information to the user (e.g. messages on-screen) 	Equivalent commands in Python: <code>Input()</code> <code>print(*****)</code>	Input num Input choice Output result
Call Function	<ul style="list-style-type: none"> - To separate your program into logically organised sections e.g.: <ul style="list-style-type: none"> - <code>def MainMenu()</code> - <code>def Level1()</code> - <code>def Level2()</code> - To call a function into action - To jump from one function into another <p>Sometimes called 'Sub-Routines'</p>	<p>Multiple flowcharts required (see examples) →</p> <p>Individual functions are displayed in their own separate flowchart(s).</p> <p>These are then called into the main flowchart as/when required</p>	

❗ In the exam, you will need to demonstrate no more than 5 complex problems ❗

2.) Pseudocode



EXAMPLE

? What is 'Pseudocode'?

Like Flowcharts, Pseudocode is used to plan out how a program will operate. It can be based on initial flowchart work, as a step closer towards writing the program code itself.

Key Command Words	What a Pseudocode program might look like
<ul style="list-style-type: none"> ■ INPUT – indicates a user will be inputting something ■ OUTPUT – indicates that an output will appear on the screen ■ WHILE – a loop (iteration) that has a condition at the beginning) ■ FOR – a counting loop (iteration) ■ REPEAT – UNTIL – a loop (iteration) that has a condition at the end ■ IF – THEN – ELSE – a decision (selection) in which a choice is made ■ any instructions that occur inside a selection or iteration are usually indented 	<pre> REPEAT OUTPUT 'What is the best subject you take?' INPUT user inputs the best subject they take STORE the user's input in the answer variable IF answer = 'Computer Science' THEN OUTPUT 'Of course it is!' ELSE OUTPUT 'Try again!' UNTIL answer = 'Computer Science' </pre>

This guide to writing Pseudocode might also be useful