The questions on this worksheet have been taken from the OCR A-Level Computer Science Practice Paper 1.1

"3-a-day" A-Level Exam Practice Unit 1 (021)

Question 1	
A company is writing a syntax checker to be used when writing HTML.	Write the code to fill dataStructureA with the tags in htmlCode.
(a) The first thing the program does is add every tag in a piece of text to the data structure dataStructureA.	
The string X is added to dataStructureA with the code	
dataStructureA.add("X")	
The string type variable ${\tt htmlCode}$ holds the code that is to have its tags added.	
If htmlCode were to contain:	
<html><head><title>My Page</title></head><body>Hello</body></html> dataStructureA would have the following contents:	
dataStructureA would have the following contents.	
<html> <head> <title> </title> </head> <body> </body> </html>	
	[7]
Question 2	
(b) Part of the program checks that the HTML tags are well formed Well formed HTML has tags that are nested but never overlag	
e.g.	
The cat sat on the mat. is well formed.	
Whereas The cat sat on the mat. is not well	
formed as p closes before the strong inside it has been closed.	
All comments and single tags (e.g. img, br etc) are removed from dataStructureA.	
All attributes are removed from the within the tags.	
(i) The contents of dataStructureA may look similar to below:	
<html> <head> <title> </title> </head> <body> <h1></h1></body></html>	
Tage are remained from John Charlestones in the same	order they were added
Tags are removed from dataStructureA in the same order they were added.	
Identify what type of data structure dataStructureA is.	
	[1]
	[1]
Question3	
dataStructureB is given a closing tag and gives the corresponding opening tag.	
and the state of t	
<pre>e.g. openingTag=dataStructureB.get("")</pre>	
openingTag is " <head>" (courier font)</head>	
(ii) Identify what type of data structure dataStructureB is.	
(ii) identity what type of data structure of	acastructures is.
	[1]

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Answer 1 Adds the tag name.. AO3.2 tagStartPos = 0Includes the opening < insideTag = false Includes the closing > and nothing further Tags are added to data structure. 7 i = 0while i < htmlCode.length Adds all tags in the string. - Sensible variable names used if htmlCode.substring(i,1) == "<" and Correct use of indentation insideTag == false then (1 per -) tagStartPos = iinsideTag = true elseif insideTag == true and htmlCode.substring(i,1) == ">" thendataStructureA.add(htmlCode.substring(ta gStartPos, i-tagStartPos+1)) insideTag = false endif i = i + 1endwhile Answer 2 AO2.1 Queue

Answer 3

Hashtable

AO2.2

Accept Hashmap/Associative Array/Dictionary

1