Review: Vocabulary and Binary Search

1. Write the correct vocabulary word next to the box that best describes it. **(4)**

abstraction	*algorithm*	*constant*	*construct*	*decompose*	*flowchart*	*pseudocode*	*variable*

a)		breaking down a complex problem into smaller, more manageable parts
b)		a memory location that stores an unchangeable value
c)		a memory location to store a value that may change while the program is running
d)		a precise method for solving a problem
e)		a smaller part used as a building block
f)		a structured, code-like, high-level description of an algorithm
g)		a diagrammatic representation of an algorithm
h)		hiding complexity by focusing on the essential features of a problem

2. The teacher has a sorted list of names from a class, as shown below. For each stage, write "`s`" for the start index, "`m`" for the middle index, and "`e`" for the end index in order to identify the stages of a ***binary search*** to find the name "Jackson" in the list. In order to calculate the middle index, use: `(start+end) DIV 2`. The indices of the array are written above the first stage to help you. (Page 30, question 6) **(7)**

	0	1	2	3	4	5	6	7	8	9
	Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall
a)										

	Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall
b)										

	Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall
c)										

	Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall
d)										

e) How many times did the algorithm need to compare two names before it was able to find the name "Jackson"?

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0	1	2	3	4	5	6	7	8	9
Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall

Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall

f) How many times would the algorithm need to compare two names in order to find the name “Linton”?

0	1	2	3	4	5	6	7	8	9
Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall

Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall

Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall

Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall

Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall

g) How many time would the algorithm need to compare two names before exiting if the list was searched for the name “Johnson”?

0	1	2	3	4	5	6	7	8	9
Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall

Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall

Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall

Azikewe	Bloom	Byrne	Davidson	Gateri	Hinton	Jackson	Linton	Smith	Wall

h) How many time would the algorithm need to compare two names before exiting if the list was searched for the name “Nielsen”? *Hint:* the answer is not the same as part (g).