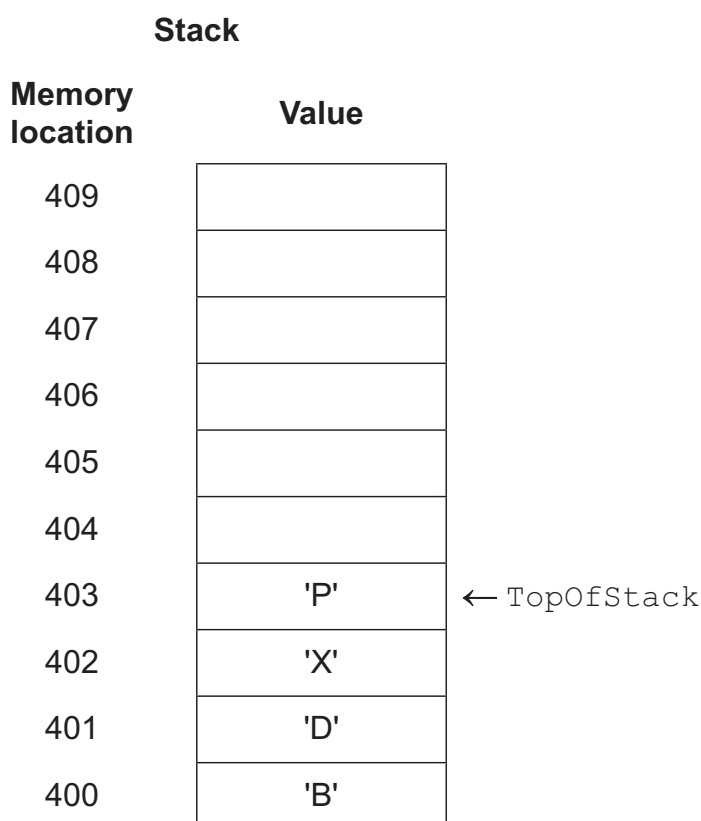


2 A programmer uses a number of Abstract Data Types (ADT) in the programs that she is developing.

(a) A stack using memory locations 400 to 409 is used in one program.

The diagram represents the current state of the stack.

A variable `TopOfStack` pointer indicates the last value added to the stack.



(i) Complete the answer column in the following table:

	Answer
the memory location of the value that has been on the stack for the longest time	
the number of consecutive push operations that will result in the <code>TopOfStack</code> variable containing 409	

[2]

(b) In a different program, the programmer decides to implement a linked list using an array of records.

(i) The array is represented in the diagram.

A pointer value of `-1` indicates the end of the linked list.

Complete the pointer field to produce a linked list that is in alphabetical order.

Index	Data	Pointer
0	"Neptune"	
1	"Jupiter"	
2	"Saturn"	
3	"Earth"	
4	"Mercury"	
5	"Uranus"	

[3]

(ii) The variable `StartPointer` contains the index of the first item in the linked list.

State the value of the variable `StartPointer`

..... [1]

(c) A third program is also being created to manage a queue.

Describe **two** features of a queue.

Feature one

.....

Feature two

.....

[2]