



4.2.3 Stacks

- 1) A photo-editing program allows a user to repeatedly undo their previous actions and redo an action that has been undone.

The **undo** action results in the state changing from the current state to the state previous to the user's most recent action. The user is able to keep using the **undo** action to go back through all previous states.

The **repeat** action results in the user's most recent action being applied again. The user is able to keep using the **repeat** action to apply the most recent action multiple times. The **repeat** action will only work when there is a most recent action that can be applied again.

- a) Explain how a single stack can be used in the implementation of the repeat action **and** the undo action.

[5 marks]

- b) State the type of error that occurs if the user tries to complete an undo action before they have completed any other actions.

[1 mark]





2) **Figure 1** shows data that has been stored in a stack implemented using an array S.

Figure 1

[7]	
[6]	
[5]	
[4]	
[3]	
[2]	Jerry
[1]	Jane
[0]	Nigel

a) What value will be returned by applying the peek operation to S?

[1 mark]

b) What value will be returned by applying the pop operation to S?

[1 mark]

c) Explain how a single stack can be used to reverse the order of the items in a queue.

[2 marks]

