

Computing

Lesson 7: Bubble Sort

Algorithms

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Materials from the Teach Computing Curriculum created by the National Centre for Computing Education



Task 1 - One pass of a bubble sort

In this task, you need to show each comparison and whether any swaps were made when executing **one pass** of a bubble sort on the cards below. The cards should be ordered from lowest to highest, with aces considered low.



Task 1 - One pass of a bubble sort

The instructions for performing **one pass** of a bubble sort can be written as:

1. Take a list of data to be sorted.
2. Repeat steps a–c for all the items in the list, starting from the first one:
 - a. Compare the item at the current position to the one next to it.
 - b. If the item at the current position is **greater than** the one next to it, swap the items within the list.
 - c. Go to the next item in the list.

The highlighted areas indicate the cards you need to compare to determine whether there is a swap, with the first two comparisons completed for you.

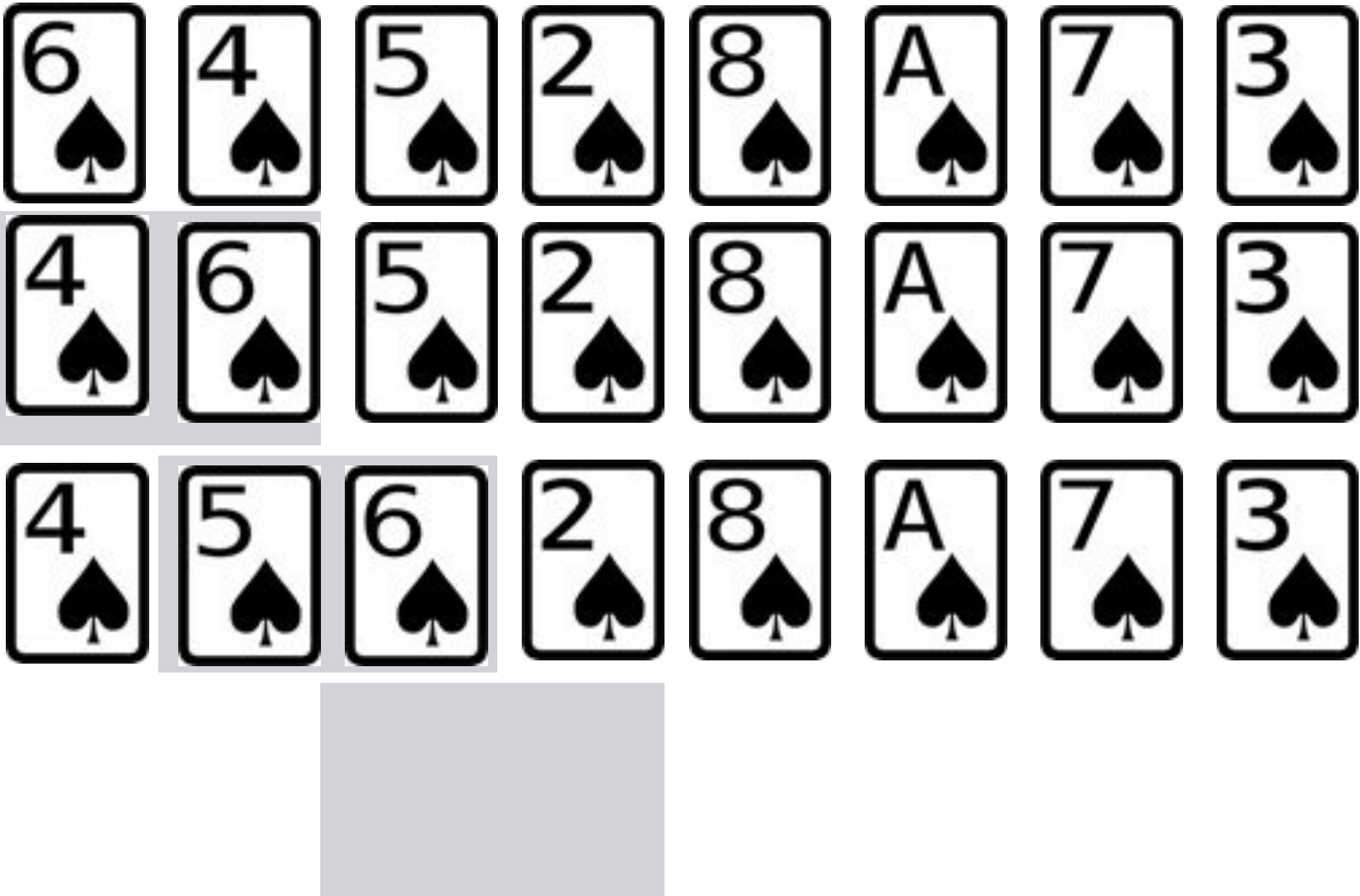


Task 1 - One pass of a bubble sort

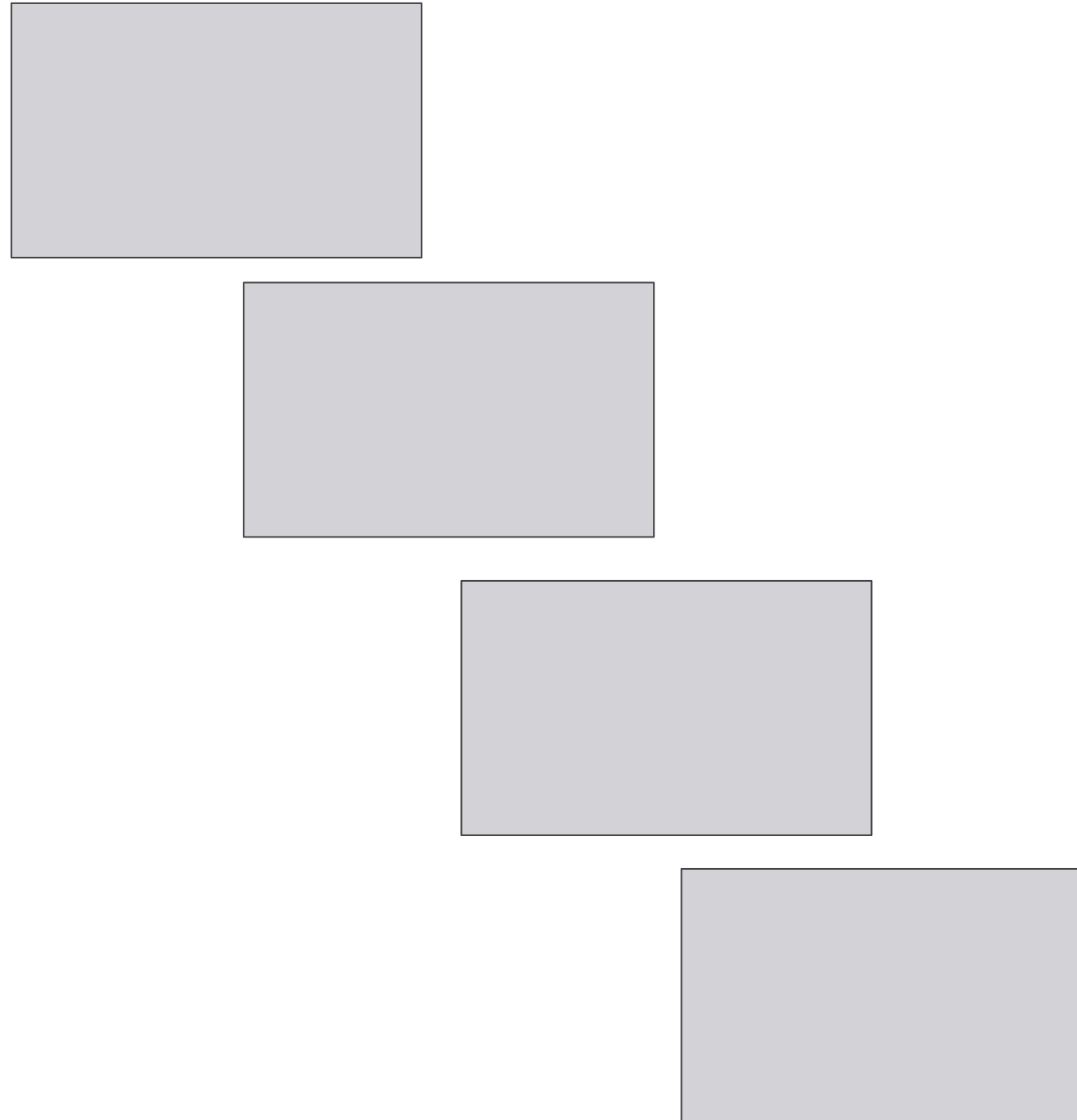
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Task 1 - One pass of a bubble sort



Task 1 - One pass of a bubble sort



Task 2 - Executing a bubble sort - part 1

Sorting a list of names

Katie has created a program that uses a file to store the names of people who have completed her game.

A sample of data is shown in **Figure 1**.

Rhonda	Vicky	Jorge	Toby	Ada	Fatima
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Figure 1



Task 2 - Executing a bubble sort - part 1

Carry out a bubble sort on the data shown in **Figure 1** by filling in the table below. Each row should show **one pass** of the algorithm and any swaps that have been made.

The first two passes have been completed for you.



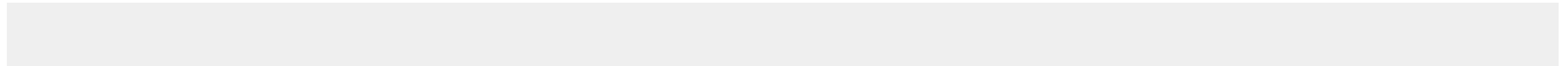
Task 2 - Executing a bubble sort - part 1

Jorge	Toby	Rhonda	Fatima	Ada	Vicky
Jorge	Rhonda	Fatima	Ada	Toby	Vicky



Task 2 - Executing a bubble sort - part 1

State the total number of passes made when executing a bubble sort on the data shown in **Figure 1**.



Task 2 - Executing a bubble sort - part 2

Sort by cuisine

Andre is developing a program for a food delivery service. The system allows users to select from a list of cuisines from around the world.

A sample of data is shown in **Figure 2**.

Persian	Greek	Indian	Thai	Nigerian	Italian	Spanish
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Figure 2



Task 2 - Executing a bubble sort - part 2

State the number of comparisons that need to be made during the first pass of a bubble sort when applied to the data shown in **Figure 2**.

State the element that will be in the correct position after one pass when executing a bubble sort on the data shown in **Figure 2**.

Show all of the stages of a bubble sort when applied to the data shown in **Figure 2**.



Task 2 - Executing a bubble sort - part 2



Task 2 - Executing a bubble sort - part 2

State the number of passes that need to be made before the data is in order when using a bubble sort on the data shown in **Figure 2**.

