

Graphstation Challenge Sheet

Bubble sort algorithm

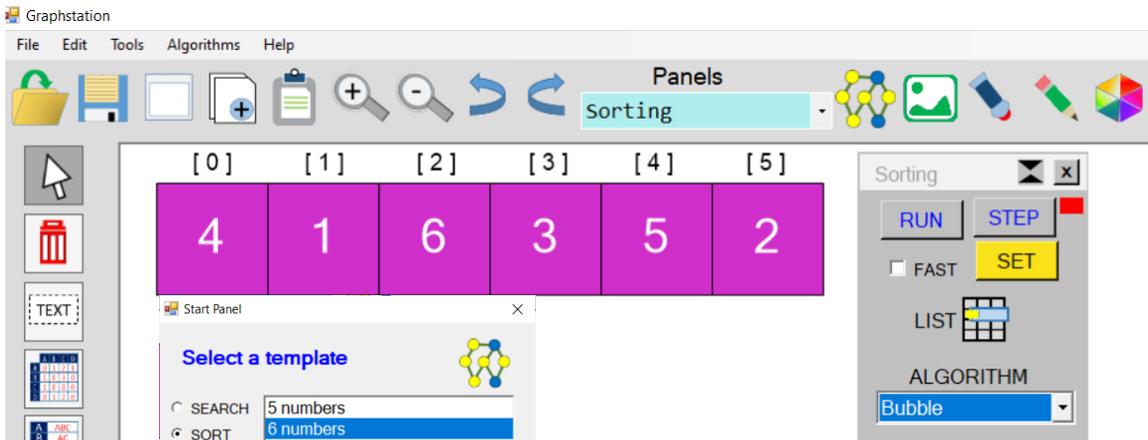


Figure 1

- **Load the template 6 numbers, then SET & RUN the algorithm**

Task 1. Explain what you see happening

- **Undo**  then, use **TOOLS > Randomise**, to mix up the numbers

Task 2. When the biggest unsorted number moves to end its called a **PASS**.

Without running the algorithm, predict the order of the numbers after one pass.

- **SET & STEP through the algorithm to see if you were correct**

Task 3. What will be the number order after 2 passes?

- **SET & STEP through the algorithm to see if you were correct**

- **Load the template 8 animals,**

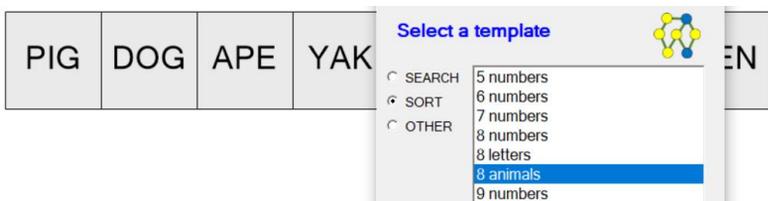
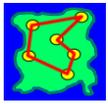


Figure 2

Task 4. RUN the algorithm and observe, does the algorithm work differently?



Graphstation Challenge Sheet

Bubble sort algorithm

```
1. for i in range len(arr):  
2.     if arr[i]>arr[i+1]:  
3.         temp = arr[i]  
4.         arr[i] = arr[i+1]  
5.         arr[i+1] = temp
```

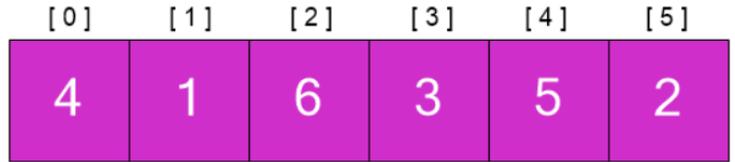


Figure 3

- **Figure 3 is the python code for the first pass, click  to see**

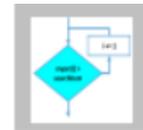
Task 5. On which line is selection used? _____

Task 6. On which line is iteration (a loop) used? _____

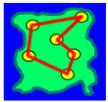
Task 7. when $i=2$, what number is at $arr[i]$? _____

Task 8. Explain what lines 3 to 5 do, click to see the code running

- **Now run the bubble sort with the flowchart running as well**

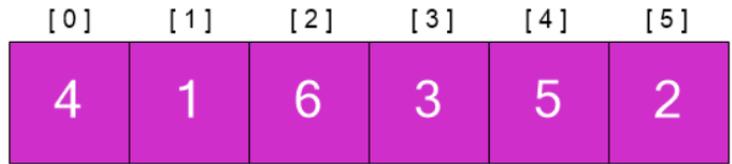


Task 9. Explain fully how the bubble sort works



Bubble sort algorithm

```
1. for i in range len(arr):
2.     if arr[i]>arr[i+1]:
3.         temp = arr[i]
4.         arr[i] = arr[i+1]
5.         arr[i+1] = temp
```



Task 1. Explain what you see happening

The algorithm is moving from left to right and swapping the numbers if the one on the left is bigger. Eventually the biggest number is moved to the far right

Tasks 2 & 3 depend upon your own order

Task 4. RUN the algorithm and observe, does the algorithm work differently?

The algorithm works in the same way as numbers, they are just compared for the order alphabetically

Task 5. On which line is selection used? 2

Task 6. On which line is iteration (a loop) used? 1

Task 7. when i=2, what number is at arr[i]? 6

Task 8. Explain what lines 3 to 5 do, click to see the code running

They swap around two numbers if arr[i] is greater then arr[i+1]. A temporary variable is used to allow this as you would have two positions the same after then line 4, which is arr[i] = arr[i+1]

Now run the bubble sort with the flowchart running as well

Task 9. Explain fully how the bubble sort works

A bubble sort algorithm goes through a list of data a number of times, comparing two items that are side by side to see which is out of order. It will keep going through the list of data until all the data is sorted into order. Each time the algorithm goes through the list it is called a 'pass'.