Executing a merge sort - Solution

Task 1 . Dog breeds

Ayuk has collected data about the different breeds of dog he has seen in his area for a local animal charity.

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

| Poodle | Bulldog | Maltese | Pug | Sheltie | Boxer | Husky |
| --- | --- | --- | --- | --- | --- | --- |

**Figure 1**

Perform a merge sort on the data shown in **Figure 1** by filling in the table below. A row should show each pair of lists that have been merged together.

The first stages of splitting each item into a list of its own has already been done, and the first row of merges has been completed for you.

| Sheltie |  | Bulldog |  | Maltese |  | Pug |  | Poodle |  | Husky |  | Boxer |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Bulldog | Sheltie |  | Maltese | Pug |  | Husky | Poodle |  | Boxer |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Bulldog | Maltese | Pug | Sheltie |  | Boxer | Husky | Poodle |
| --- | --- | --- | --- | --- | --- | --- | --- |

| Boxer | Bulldog | Husky | Maltese | Poodle | Pug | Sheltie |
| --- | --- | --- | --- | --- | --- | --- |

**State** the total number of merges that took place when executing a merge sort on the data shown in **Figure 1**.

| 6 |
| --- |

**State** the number of new lists that were created during the merge part of the algorithm.

| 6 |
| --- |

Task 2 . Crossword

Jennifer is developing a program that randomly generates a crossword based on a database of words. She is currently writing a script to check all of the 4 letter words.

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

| Peak | Tech | Holy | Film | Seen | Neck | Pace | Bulk | Moon |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Figure 2**

Perform a merge sort on the data shown in **Figure 2** by filling in the table below. A row should either show each list that has been split in half, or each pair of lists that have been merged together.

| Peak | Tech | Holy | Film | Seen | Neck | Pace | Bulk | Moon |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Peak | Tech | Holy | Film | Seen |  | Neck | Pace | Bulk | Moon |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Peak | Tech | Holy |  | Film | Seen |  | Neck | Pace |  | Bulk | Moon |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Peak | Tech |  | Holy |  | Film |  | Seen |  | Neck |  | Pace |  | Bulk |  | Moon |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Peak |  | Tech |  | Holy |  | Film |  | Seen |  | Neck |  | Pace |  | Bulk |  | Moon |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Peak | Tech |  | Film | Holy |  | Neck | Seen |  | Bulk | Pace |  | Moon |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Film | Holy | Peak | Tech |  | Bulk | Neck | Pace | Seen |  | Moon |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Bulk | Film | Holy | Neck | Pace | Peak | Seen | Tech |  | Moon |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Bulk | Film | Holy | Moon | Neck | Pace | Peak | Seen | Tech |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |

Explorer Task .

Research what is meant by a “divide and conquer” algorithm.