# *Sequential Output Tracing*

In these type of questions an input is given followed by its rearrangement steps (output). A student has to study the output steps and rearrange the input in question.

There are various types of pattern in rearrangement sequence are given. Some of them are as follows:

1. Arrangement of given numbers in ascending/descending order.
2. Arrangement of given words in forward/reverse alphabetical order.
3. Arrangement of sets of numbers/words in reverse order.
4. Changing of places of numbers/words.
5. Arrangement of words in ascending/descending order of number of letters the words consist of.

## EXAMPLE

**Direction (1 - 2):** A number arrangement machine when given an input of numbers rearranges them by following a particular rule in each step as given below:

| Input     : | 45 | 68 | 42 | 12 | 18 | 56 |
|-------------|----|----|----|----|----|----|
| Step I   : | 68 | 45 | 42 | 12 | 18 | 56 |
| Step II  : | 68 | 56 | 45 | 42 | 12 | 18 |
| Step III : | 68 | 56 | 45 | 42 | 18 | 12 |

Step III is the final/last step.
As per the pattern in above rearrangement, answer the following questions.

**1.** **If the input is "16    66    32    55    40    54", then what would be the step III?**

| (a) 66 | 55 | 54 | 40 | 32 | 16 |
|--------|----|----|----|----|----|
| (b) 16 | 32 | 40 | 54 | 55 | 66 |
| (c) 66 | 55 | 54 | 16 | 32 | 40 |
| (d) 66 | 55 | 16 | 32 | 40 | 54 |

**Explanation (c):**

We observe that step III in the given arrangement, which is the final step, has all the numbers in descending order. Also :

In step I, the largest number i.e., 68 in input is taken and it is followed by other numbers as it is.

In step II; keeping no change in 68, the second largest number i.e., 56 is taken and it is followed by other numbers as it is.

The same process is followed until all the numbers are in descending order.

Let us now follow the same pattern for the input "16 66 32 55 40 54".

| Input    | 16 | 66 | 32 | 55 | 40 | 54 |
|----------|----|----|----|----|----|----|
| Step I   | 66 | 16 | 32 | 55 | 40 | 54 |
| Step II  | 66 | 55 | 16 | 32 | 40 | 54 |
| Step III | 66 | 55 | 54 | 16 | 32 | 40 |
| Step IV  | 66 | 55 | 54 | 40 | 16 | 32 |
| Step V   | 66 | 55 | 54 | 40 | 32 | 16 |

Here the final step is step V.
Hence step III is: "66    55    54    16    32    40"

**2.** If input is 85 16   36   04   19   97   63   09, then the last step is _____.

| (a) 97 | 85 | 63 | 36 | 16 | 04 | 19 | 09 |
|--------|----|----|----|----|----|----|----|
| (b) 97 | 85 | 63 | 16 | 36 | 04 | 19 | 09 |
| (c) 97 | 85 | 63 | 36 | 19 | 16 | 04 | 09 |
| (d) 97 | 85 | 63 | 36 | 19 | 16 | 09 | 04 |

**Explanation (d):** The steps of given input is

| Step I   : | 97 | 85 | 16 | 36 | 04 | 19 | 63 | 09 |
|------------|----|----|----|----|----|----|----|----|
| Step II   : | 97 | 85 | 63 | 16 | 36 | 04 | 19 | 09 |
| Step III  : | 97 | 85 | 63 | 36 | 16 | 04 | 19 | 09 |
| Step IV   : | 97 | 85 | 63 | 36 | 19 | 16 | 04 | 09 |
| Step V    : | 97 | 85 | 63 | 36 | 19 | 16 | 09 | 04 |

Step V is the last step for the given input.