**Counting and Optimisation Lab 2 Application of Counting to Permutations**

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**Questions**

1. Give a precise definition of a permutation
2. List all permutations of the letters ABC
3. List all 2 letter permutations of the letters in the word CAT

**Practical**

The Natural numbers can be considered as a collection of permutations

{1,2,3,4,5,......}

{1,2,3}, {2,3,4}, ….

Use this fact to find the missing element in a set of intergers as a permutation

That is given {4,1,3,2} the missing element would be 5

given {4,1,2} the missing element would be 3