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| **Permutation in C++** | |
| #include <iostream>  using namespace std;  void permutations(int cb, int nboxes, int items[], int ssf, int ritems, string asf) {      if (cb > nboxes) {          if (ssf == ritems) {              cout << asf << endl;          }          return;      }      for (int i = 0; i < ritems; i++) {          if (items[i] == 0) {              items[i] = 1;              permutations(cb + 1, nboxes, items, ssf + 1, ritems, asf + to\_string(i + 1));              items[i] = 0;          }      }      permutations(cb + 1, nboxes, items, ssf, ritems, asf + "0");  }  int main() {      int nboxes = 3;      int ritems = 2;      int cb = 1;      int ssf = 0;      int items[ritems] = {0}; // Initialize items array with 0s      permutations(cb, nboxes, items, ssf, ritems, "");      return 0;  } | Key Variables:  | **Var** | **Meaning** | | --- | --- | | cb | current box index | | ssf | selected so far – number of items placed | | items[] | array of 0/1, indicating whether each item (1 to ritems) is used | | asf | answer so far – the configuration of items across boxes |  🧾 Dry Run Table:  | **cb** | **items** | **ssf** | **asf** | **Description** | | --- | --- | --- | --- | --- | | 1 | [0,0] | 0 | "" | Start, box 1 | | 2 | [1,0] | 1 | "1" | Place item 1 in box 1 | | 3 | [1,1] | 2 | "12" | Place item 2 in box 2 | | 4 | [1,1] | 2 | "120" | ✅ Output: item1 in box1, item2 in box2 | | 3 | [1,1] | 2 | "102" | item2 in box3 | | 3 | [1,0] | 1 | "10" | skip box 2 | | 4 | [1,1] | 2 | "102" | ✅ Output | | 2 | [0,1] | 1 | "2" | item2 in box 1 | | 3 | [1,1] | 2 | "21" | item1 in box2 | | 4 | [1,1] | 2 | "210" | ✅ Output | | 3 | [0,1] | 1 | "20" | box2 empty | | 4 | [1,1] | 2 | "201" | ✅ Output | | 2 | [0,0] | 0 | "0" | box1 empty | | 3 | [1,0] | 1 | "01" | item1 in box2 | | 4 | [1,1] | 2 | "012" | ✅ Output | | 3 | [0,1] | 1 | "02" | item2 in box2 | | 4 | [1,1] | 2 | "021" | ✅ Output | | 3 | [0,0] | 0 | "00" | box2 empty | | 4 | - | 0 | "000" | ❌ Not valid – ssf < ritems | |
| Output:-  120  102  210  201  012  021 | |