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| **Subsets in C++** | |
| #include <iostream>  #include <vector>  using namespace std;  class Subsets {  public:  vector<vector<int>> subsets(vector<int>& nums) {  int n = nums.size();  int totalno = (1 << n);  vector<vector<int>> ans;    for (int i = 0; i < totalno; i++) {  vector<int> temp;  for (int j = 0; j < n; j++) {  if (checkBit(i, j)) {  temp.push\_back(nums[j]);  }  }  ans.push\_back(temp);  }    return ans;  }  private:  // Helper function to check if the i-th bit in n is set  bool checkBit(int n, int i) {  return (n & (1 << i)) != 0;  }  };  int main() {  // Create an instance of the Subsets class  Subsets solution;  // Hardcoded input array  vector<int> nums = {1, 2, 3}; // Example input  // Calling subsets to generate all subsets of the array  vector<vector<int>> subsets = solution.subsets(nums);  // Printing all subsets  for (auto& subset : subsets) {  cout << "[";  for (size\_t i = 0; i < subset.size(); i++) {  cout << subset[i];  if (i < subset.size() - 1) {  cout << ", ";  }  }  cout << "]" << endl;  }  return 0;  } | Detailed Table:  | **i (Binary)** | **Subset Indexes** | **Subset Elements** | **Subset** | | --- | --- | --- | --- | | 0 (000) | None | None | [] | | 1 (001) | 0 | {1} | [1] | | 2 (010) | 1 | {2} | [2] | | 3 (011) | 0, 1 | {1, 2} | [1, 2] | | 4 (100) | 2 | {3} | [3] | | 5 (101) | 0, 2 | {1, 3} | [1, 3] | | 6 (110) | 1, 2 | {2, 3} | [2, 3] | | 7 (111) | 0, 1, 2 | {1, 2, 3} | [1, 2, 3] |   **Explanation of Each Iteration:**   1. **Iteration 1 (i = 0 / Binary 000)**:    * No bits are set, so the subset is empty: []. 2. **Iteration 2 (i = 1 / Binary 001)**:    * Only the least significant bit is set, so the subset includes only the element 1: [1]. 3. **Iteration 3 (i = 2 / Binary 010)**:    * The second bit is set, so the subset includes only the element 2: [2]. 4. **Iteration 4 (i = 3 / Binary 011)**:    * The first and second bits are set, so the subset includes the elements 1 and 2: [1, 2]. 5. **Iteration 5 (i = 4 / Binary 100)**:    * The third bit is set, so the subset includes only the element 3: [3]. 6. **Iteration 6 (i = 5 / Binary 101)**:    * The first and third bits are set, so the subset includes the elements 1 and 3: [1, 3]. 7. **Iteration 7 (i = 6 / Binary 110)**:    * The second and third bits are set, so the subset includes the elements 2 and 3: [2, 3]. 8. **Iteration 8 (i = 7 / Binary 111)**:    * All bits are set, so the subset includes all elements: [1, 2, 3].   **Final Output:**  The final list of subsets is:  [ ]  [1]  [2]  [1, 2]  [3]  [1, 3]  [2, 3]  [1, 2, 3] |
| []  [1]  [2]  [1, 2]  [3]  [1, 3]  [2, 3]  [1, 2, 3] | |