

PowerSet in C++

```
#include <iostream>
using namespace std;

void generatePowerSet(char set[], int n) {
    for (int i = 0; i < (1 << n); i++) {
        cout << "{ ";
        for (int j = 0; j < n; j++) {
            if (i & (1 << j)) {
                cout << set[j] << " ";
            }
        }
        cout << "}" << endl;
    }
}

int main() {
    char set[] = {'a', 'b', 'c'};
    int n = sizeof(set) / sizeof(set[0]);
    generatePowerSet(set, n);

    return 0;
}
```

Dry Run Example:

Let's dry run this with the set {'a', 'b', 'c'}. The set has 3 elements, so $n = 3$ and the total number of subsets will be $2^3 = 8$.

i	i in binary	Subset representation (bits set)	Subset generated
0	000	None	{ }
1	001	3rd bit set (only c)	{ c }
2	010	2nd bit set (only b)	{ b }
3	011	2nd & 3rd bits set (b, c)	{ b c }
4	100	1st bit set (only a)	{ a }
5	101	1st & 3rd bits set (a, c)	{ a c }
6	110	1st & 2nd bits set (a, b)	{ a b }
7	111	All bits set (a, b, c)	{ a b c }

Output:

```
{ }
{ c }
{ b }
{ b c }
{ a }
{ a c }
{ a b }
{ a b c }
```

```
{ }
{ a }
{ b }
{ a b }
{ c }
{ a c }
{ b c }
{ a b c }
```