Histogram of char:

```
int C[256]; // store counts
for (int i=0; i<256; i++) C[i] = 0;
char x;
while (cin >> x)
    C[x]++;
```

For strings:

```
map<string, int> C;
string x;
while (cin >> x)
    C[x]++;
```

Power Set: Say $S = \{0,1,2\}$.

$$\mathcal{P}(S) = \{\{\}, \{0\}, \{1\}, \{2\}, \{0,1\}, \{0,2\}, \{1,2\}, \{0,1,2\}\}$$

if $|S| = n$, $|\mathcal{P}(S)| = 2^n$

Recursive breakdown: how to obtain $\mathcal{P}(S \cup \{x\})$ from $\mathcal{P}(S)$?

$$\mathcal{P}(S) \cup (\mathcal{P}(S) + \{x\})$$

"add x to every set in $\mathcal{P}(S)$"

E.g. $S = \{0,1\}$. Then

$\mathcal{P}(S) = \{\{\}, \{0\}, \{1\}, \{0,1\}\}$

$\mathcal{P}(S) + \{2\} = \{\{2\}, \{0,2\}, \{1,2\}, \{0,1,2\}\}$

Algorithm:

Base case: $|S| = 0$ $(S = \{\})$

Then $\mathcal{P}(S) = \{\{\}\}$ ...