

Power Set

$S = "abc"$ \rightarrow $"", a, b, c, ab, ac, bc, abc$

TUF

Power Set

$100 \xrightarrow{1} \ll 2$

$S = "abc"$ \rightarrow $"", a, b, c, ab, ac, bc, abc$

$n = 3$

$2^3 = 8$

$$\begin{array}{r} 2 \\ 101 \\ 100 \\ \hline 100 \end{array} \xrightarrow{1 < 2} \begin{array}{r} 101 \\ 100 \\ \hline 000 \end{array} \rightarrow (! = 0)$$

Q) i^{th} bit is set or not?

$(n \& (1 << i)) != 0$

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num	2	1	0
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0
7	1	1	1

TUF

Power Set

$S = \overset{0}{a} \overset{1}{b} \overset{2}{c} \rightarrow "", a, b, c, ab, ac, bc, abc$ $0 \rightarrow \times$
 $1 \rightarrow \checkmark$

num	2	1	0	ind	
0	0	0	0		$\rightarrow ""$
1	0	0	1		$\rightarrow a$
2	0	1	0		$\rightarrow b$
3	0	1	1		$\rightarrow ab$
4	1	0	0		$\rightarrow c$
5	1	0	1		$\rightarrow ac$
6	1	1	0		$\rightarrow bc$
7	1	1	1		$\rightarrow abc$

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5	1	0	1		$\rightarrow ac$
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$\rightarrow (1 < n) - 1$
for (num = (0 \rightarrow $2^n - 1$))

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S = "abc" → "", a, b, c, ab, ac, bc, abc

0 → x
1 → ✓
→ (1 < n) - 1

num	2	1	0 ← ind	
0	0	0	0	→ ""
1	0	0	1	→ a
2	0	1	0	→ b
3	0	1	1	→ ab
4	1	0	0	→ c
5	1	0	1	→ ac
6	1	1	0	→ bc
7	1	1	1	→ abc

```

for ( num = (0 → 2^n - 1) )
{
    sub = "";
    for ( i = (0 → n-1) )
    {
        if ( num & (1 << i) )
            sub += s[i];
    }
    print(sub);
}
  
```

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0 → x
1 → ✓
→ (1 < n) - 1

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1	0	0	1	→ a
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4	1	0	0	→ c
5	1	0	1	→ ac
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$O(2^n \times n)$
 $O(1)$

```

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