Title Title Title Title Title

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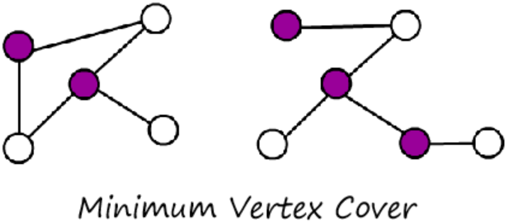
Block & Image[1]

Definition

A vertex cover of a graph is a set of vertices such that each edge of the graph is incident to at least one vertex of the set.



[1] footnote

Code Example

```cpp
bool dfs(int x) {
    for (auto &y:e[x])
    if (!used[y]) {
        used[y] = true;
        if (link[y] == -1 || dfs(link[y])) {
            link[y] = x;
            return true;
        }
    }
    return false;
}
```

```cpp
int hungary() {
    int res = 0;
    memset(link, -1, sizeof(link));
    for (int i = 1; i <= n; ++i) {
        memset(used, false, sizeof(used));
        if (dfs(i)) ++res;
    }
    return res;
}
```

Pseudocode 伪代码

- numerical analysis, computational geometry...
- time complexity $O(\log((R-L)/\epsilon))$

```
procedure BinarySearchOnRealNumbers($L$, $R$)
    while $R - L > \epsilon$ do
        $mid \leftarrow (L + R)/2$
        if lessThanAns($mid$) then
            $L \leftarrow mid$
        else
            $R \leftarrow mid$
    return $L$
```

Pause

- 测试一下pause语句的功能

任务

统计及格学生的平均成绩（不计不及格的学生和分数）

```python
scores = [76, 83, 89, 45, 67, 89, 85, 77]
sum_, count = 0, 0
for score in scores:
    if score < 60:
        continue
    sum_ += score
    count += 1
print('平均成绩为:', sum_/count)
```

```python
scores = [76, 83, 89, 45, 67, 89, 85, 77]
sum_, count = 0, 0
for score in scores:
    if score >= 60:
        sum_ += score
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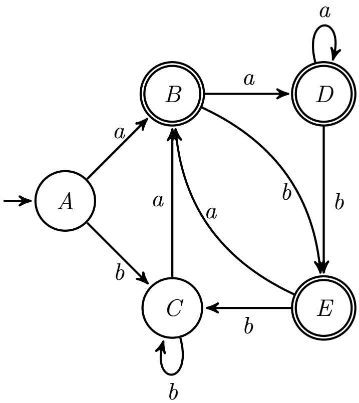
TIKZ

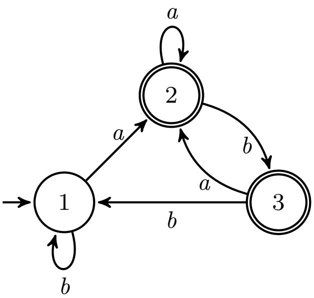
任务

将正则表达式 $(a \mid b) * a(a \mid b \mid \epsilon)$ 转化成一个 DFA 并最小化

先构造出 NFA，之后使用**子集构造法**转 DFA



最小化 $1:\{A,C\},2:\{B,D\},3:\{E\}$



Math Formula

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- 欧拉公式：

$$e^{i\pi} + 1 = 0$$

- 拉格朗日插值：

$$A(x) = \sum_{k=0}^{n-1} y_k \frac{\prod_{j\neq k}(x - x_j)}{\prod_{j\neq k}(x_k - x_j)}$$

Table

Algorithm	Time (worst)	Time (avg.)	Space	Stable	In-place
insertion sort	$\Theta(n^2)$	$\Theta(n^2)$	$O(1)$	yes	yes
merge sort	$\Theta(n \log n)$	$\Theta(n \log n)$	$O(N)$	yes	no
heapsort	$O(n \log n)$	$O(n \log n)$	$O(1)$	no	yes
quick sort	$\Theta(n^2)$	$\Theta(n \log n)$	$O(N)$ $O(\log N)$	no	yes
counting sort	$\Theta(k + n)$	$\Theta(k + n)$	$O(k)$	yes	no
radix sort	$\Theta(d(k + n))$	$\Theta(d(k + n))$	$O(k + n)$	-	no
bucket sort	$\Theta(n^2)$	$\Theta(n)$	$O(n)$	yes	no

Other Tables

i	0	1	2	3	4	5
s	$	#	a	#	a	#

表 1: A realistic table I have built

Small col	Big col		
Grouped items	Item 1		
	Item 2		
Usual row	Spam	Bacon	Eggs