

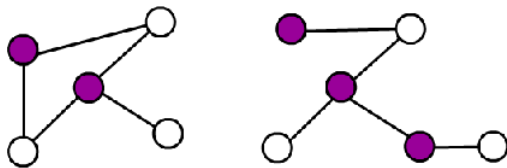
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Block & Image¹

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.



Minimum Vertex Cover

¹footnote

Code Example

```
1 bool dfs(int x) {  
2     for (auto &y:e[x])  
3         if (!used[y]) {  
4             used[y] = true;  
5             if (link[y] == -1 || dfs(link[y])) {  
6                 link[y] = x;  
7                 return true;  
8             }  
9         }  
10    return false;  
11 }
```

```
1 int hungary() {  
2     int res = 0;  
3     memset(link, -1, sizeof(link));  
4     for (int i = 1; i <= n; ++i) {  
5         memset(used, false, sizeof(used));  
6         if (dfs(i)) ++res;  
7     }  
8     return res;  
9 }
```

Pseudocode

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

```
1: procedure BINARYSEARCHONREALNUMBERS( $L, R$ )
2:   while  $R - L > \epsilon$  do
3:      $mid \leftarrow (L + R)/2$ 
4:     if LESSTHANANS( $mid$ ) then
5:        $L \leftarrow mid$ 
6:     else
7:        $R \leftarrow mid$ 
   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)

```
1 scores = [76, 83, 89, 45, 67, 89, 85, 77]
2 sum_, count = 0, 0
3 for score in scores:
4     if score < 60:
5         continue
6     sum_ += score
7     count += 1
8 print('平均成绩为:', sum_/count)
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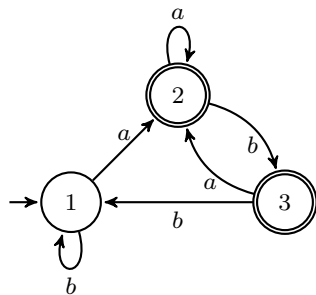
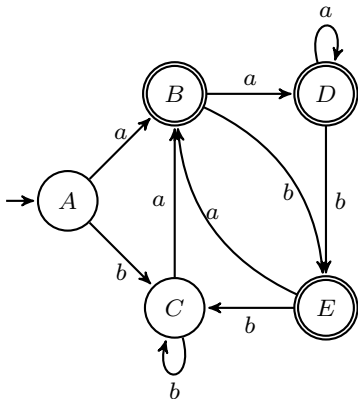
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任务

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 $1 : \{A, C\}, 2 : \{B, D\}, 3 : \{E\}$



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- 欧拉公式:

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

- 拉格朗日插值:

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