美系演算 —与美系代数的等价性



佛短內容

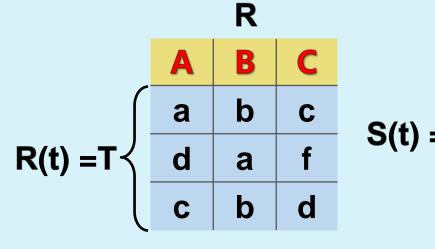
关系代数的基本运算等价的元组关系演算公式

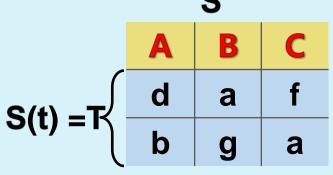
五种基本操作 并 差 广义笛卡尔积 投影 选择

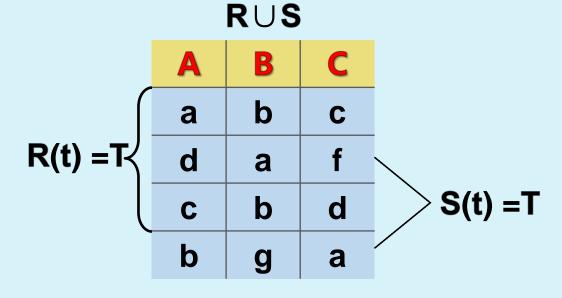


并运算

$\mathsf{R} \cup \mathsf{S} \equiv \{\mathsf{t} \mid \mathsf{R}(\mathsf{t}) \vee \mathsf{S}(\mathsf{t})\}$



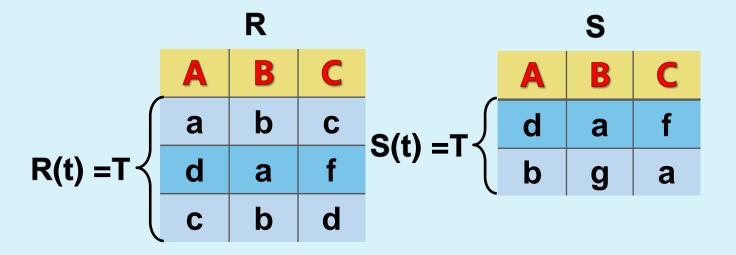






差运算

$R - S \equiv \{t \mid R(t) \land \neg S(t)\}$



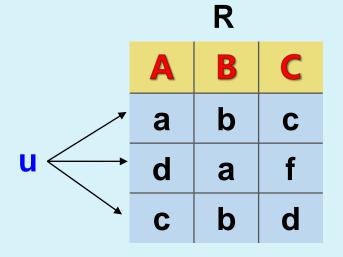
	K-3		
A	В	C	
а	b	С	R(t) =T S(t) =F
С	b	d	$\int S(t) = F$

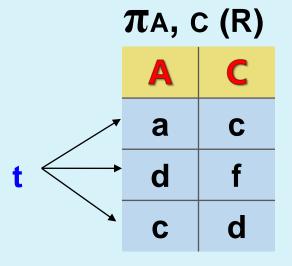


投影

$$\pi_{i1, i2,...ik}(R) \equiv \{t^{(k)} | (\exists u)(R(u) \land t[1] = u[i_1] \land ... \land t[k] = u[i_k])\}$$

$$\{t^{(2)}|(\exists u) (R(u) \land t[1]=u[1] \land t[2]=u[3])\}$$



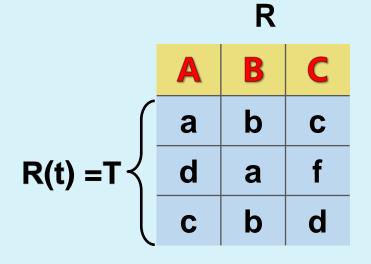




选择

$$\sigma_{\mathsf{F}}(\mathsf{R}) \equiv \{\mathsf{t} \mid \mathsf{R}(\mathsf{t}) \land \mathsf{F}'\}$$

$${t \mid R(t) \land t[2] = b'}$$



中国人民解放军陆军工程大学



广义笛卡尔积

$$R \times S ≡ \{t^{(m+n)}|(\exists u^{(m)})(\exists v^{(n)})(R(u) \land S(v) \land t[1]=u[1] \land ... \land t[m]=u[m] \land t[m+1]=v[1] \land ... \land t[m+n]=v[n]) \}$$

$$\{t^{(5)} \mid (\exists u)(\exists v) (R(u) \land S(v) \land t[1] = u[1] \land t[2] = u[2] \land t[3] = u[3] \land t[4] = v[1] \land t[5] = v[2])\}$$

R				S		
	A	В	C		D	E
u	a1	b1	c1		b1	c1
	a1	b2	с3	v <	b1	c2
					b2	c2

A	В	C	D	E
a1	b1	c1	b1	c1
a1	b1	c1	b1	c2
a1	b1	c1	b2	c2
a1	b2	с3	b1	с1
a1	b2	с3	b1	c2
a1	b2	с3	b2	c2

RxS

中国人民解放军陆军工程大学



小结

```
#: R \cup S \equiv \{t \mid R(t) \lor S(t)\}
差: R一S ≡ {t | R(t)^¬ S(t)}
积: R \times S \equiv \{t^{(m+n)} | (\exists u^{(m)})(\exists v^{(n)})(R(u) \land S(v) \land t[1] = u[1] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land t \in R(v) \land t[n] = u[n] \land ... \land u[n] = u[n] \land ... \land u[n] = u[n] \land ... \land u[n] = u[n] \land u[n] = u[n] \land u[n] \land u[n] = u[n] \land u[
                                                                                                                                                                                                                                                      t[m]=u[m] \land t[m+1]=v[1] \land ... \land t[m+n]=v[n])
  投影: \pi_{i1, i2,...ik}(R) \equiv \{t^{(k)} | (\exists u)(R(u) \land t[1] = u[i_1] \land ... \land t[k] = u[i_k])\}
  选择: σ<sub>F</sub>(R) ≡ {t | R(t) ∧ F'}
```