



Deseta Nedelja

– Transakcije: Provera serijalizovanosti –

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- $T_i = ((O_{i1}, X_{i1}), \dots, (O_{im}, X_{im}))$

O_i – operacija (Read, Write)

X_i – podatak

- **Osobine**

- Atomska
- Konzistentna
- Nezavisna
- Trajna

- **Stanja transakcije**

Kreirana, Aktivna, Završena, Potvrđena, Pogrešna, Poništena, Uništena

- **Izvršavanje skupa transakcija $T = \{T_1, \dots, T_n\}$, $I(T)$**

- Serijski
- Konkurentno

- **Ekvivalentni redosled**

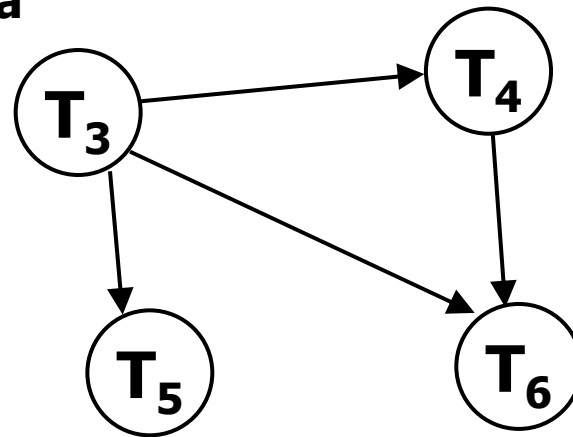
- **Serijalizovani redosled**

- Relacija uređenosti

- **Transakcije koje čitaju podatak pre ažuriranja**
 - Konstrukcija prioritnog grafa redosleda
 - Provera serijalizovanosti (nepostojanje ciklusa)
- **Transakcije koje ne čitaju podatak pre ažuriranja**
 - Konstrukcija poligrafa (označeni prioritni graf) redosleda
 - Provera serijalizovanosti (nepostojanje ciklusa)

Primer 1 – Prioritetni graf redosleda

- $T = \{T_3, T_4, T_5, T_6\}$
- $I_{p1}(T) = ((\text{Read}, X_4, T_6), (\text{Write}, X_4, T_6), (\text{Read}, X_2, T_3),$
 $(\text{Write}, X_2, T_3), (\text{Read}, X_2, T_4), (\text{Write}, X_2, T_4),$
 $(\text{Read}, X_1, T_3), (\text{Write}, X_1, T_3), (\text{Read}, X_2, T_6),$
 $(\text{Write}, X_2, T_6), (\text{Read}, X_3, T_3), (\text{Write}, X_3, T_3),$
 $(\text{Read}, X_3, T_5), (\text{Write}, X_3, T_5))$
- **Graf Redosleda**



- **Ekvivalentni serijski redosledi (topološkim sortiranjem grafa)**
 - $T_3 \rightarrow T_4 \rightarrow T_5 \rightarrow T_6$
 - $T_3 \rightarrow T_5 \rightarrow T_4 \rightarrow T_6$
 - $T_3 \rightarrow T_4 \rightarrow T_6 \rightarrow T_5$

- **Add initial transaction T_b that write all DB data**
- **Add final transaction T_f that read all DB data**
- **Create node for each transaction**
- **If $W_i(x) \Rightarrow R_j(x)$ in given schedule then create directed edge $T_i \rightarrow T_j$**
- **For each $W_i(x) \Rightarrow R_j(x)$ consider each $W_k(x)$ ($T_k \neq T_b$):**
 - If $T_i = T_b$ and $T_j \neq T_f$ then create directed edge $T_j \rightarrow T_k$
 - If $T_i \neq T_b$ and $T_j = T_f$ then create directed edge $T_k \rightarrow T_i$
 - If $T_i \neq T_b$ and $T_j \neq T_f$ then create directed edges $T_k \rightarrow T_i$ and $T_j \rightarrow T_k$ (dashed and labeled)
- **If resulting polygraph contains no cycles, the schedule is view serializable**
Else for each pair of dashed edges with the same label choose one and check if resulting polygraph is "acyclic"

Primer 2 – Poligraf redosleda

- $T = \{T_7, T_8, T_{10}\}$

| Vreme | T_7 | T_8 | T_{10} |
|-------|----------|----------|----------|
| t_1 | Read(Q) | | |
| t_2 | | Write(Q) | |
| t_3 | | | Read(Q) |
| t_4 | Write(Q) | | |
| T_5 | | | Write(Q) |

- Poligraf Redosleda**

