5, 4, 7, 1, 4, 5, 3, 2, 4, 5, 4, 7, 6, 2, 7, 4, 5, 4, 7, 2

**FIFO**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | 4 | 7 | 1 | 4 | 5 | 3 | 2 | 4 | 5 | 4 | 7 | 6 | 2 | 7 | 4 | 5 | 4 | 7 | 2 |
| 5 | 5 | 5 | 5 | 5 | 5 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 5 | 5 |
|  | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 2 | 2 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 |
|  |  | 7 | 7 | 7 | 7 | 7 | 7 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|  |  |  | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**PageFaults**: 14

**LRU (Least Recently Used)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | 4 | 7 | 1 | 4 | 5 | 3 | 2 | 4 | 5 | 4 | 7 | 6 | 2 | 7 | 4 | 5 | 4 | 7 | 2 |
| 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|  | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
|  |  | 7 | 7 | 7 | 7 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
|  |  |  | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**PageFaults**: 10

**OPT**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | 4 | 7 | 1 | 4 | 5 | 3 | 2 | 4 | 5 | 4 | 7 | 6 | 2 | 7 | 4 | 5 | 4 | 7 | 2 |
| 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 2 |
|  | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
|  |  | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
|  |  |  | 1 | 1 | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**PageFaults**: 8

FIFO=14, LRU=10, OPT= 8

**ΘΕΜΑ 10**

**7, 4, 3, 1, 7, 4, 2, 7, 4, 3, 1, 2, 7, 4, 7**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **7** | **4** | **3** | **1** | **7** | **4** | **2** | **7** | **4** | **3** | **1** | **2** | **7** | **4** | **7** |
| **7** | **7** | **7** | **1** | **1** | **1** | **2** | **2** | **2** | **2** | **2** | **2** | **7** | **7** | **7** |
|  | **4** | **4** | **4** | **7** | **7** | **7** | **7** | **7** | **3** | **3** | **3** | **3** | **4** | **4** |
|  |  | **3** | **3** | **3** | **4** | **4** | **4** | **4** | **4** | **1** | **1** | **1** | **1** | **1** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **7** | **4** | **3** | **1** | **7** | **4** | **2** | **7** | **4** | **3** | **1** | **2** | **7** | **4** | **7** |
| **7** | **7** | **7** | **7** | **7** | **7** | **2** | **2** | **2** | **2** | **1** | **1** | **1** | **1** | **1** |
|  | **4** | **4** | **4** | **4** | **4** | **4** | **7** | **7** | **7** | **7** | **2** | **2** | **2** | **2** |
|  |  | **3** | **3** | **3** | **3** | **3** | **3** | **4** | **4** | **4** | **4** | **7** | **7** | **7** |
|  |  |  | **1** | **1** | **1** | **1** | **1** | **1** | **3** | **3** | **3** | **3** | **4** | **4** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **7** | **4** | **3** | **1** | **7** | **4** | **2** | **7** | **4** | **3** | **1** | **2** | **7** | **4** | **7** |
| **7** | **7** | **7** | **7** | **7** | **7** | **7** | **7** | **7** | **7** | **7** | **7** | **7** | **7** | **7** |
|  | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** |
|  |  | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** |
|  |  |  | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
|  |  |  |  |  |  | **2** | **2** | **2** | **2** | **2** | **2** | **2** | **2** | **2** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**X = 11, Y=12, Z=5**

**(A) Αυξάνοντας τον αριθμό των πλαισίων είναι λογικό να μειώνεται ο αριθμός των σφαλμάτων σελίδας, επομένως ισχύει Χ > Υ > Ζ.  
(Β) Ειδικά για τις περιπτώσεις με τρία (3) και τέσσερα (4) πλαίσια, ισχύει Χ < Υ.  
(Γ) Ειδικά για τις περιπτώσεις με τέσσερα (4) και πέντε (5) πλαίσια, ισχύει Υ < Ζ.  
(Δ) Ειδικά για τις περιπτώσεις με τρία (3) και πέντε (5) πλαίσια, ισχύει Χ < Ζ.**