Quiz 8 Buffer Management and Indexing

Due Nov 1 at 10:30am **Points** 100 **Questions** 10
Available Nov 1 at 10am - Nov 1 at 10:30am 30 minutes **Time Limit** None
Allowed Attempts Unlimited

Instructions

This is a 30 minutes quiz containing True/False and Multiple Choice questions.

Having an issue with the quiz? Please send an email to the course staff (rkheni@wpi.edu) (mailto:cvieira@wpi.edu) with "CS542 Quiz" included in the subject line any time during the quiz. If you require help through zoom then please join the zoom link https://wpi.zoom.us/j/2094237642 (https://wpi.zoom.us/j/2094237642) .

This quiz was locked Nov 1 at 10:30am.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	9 minutes	55 out of 100

Score for this attempt: **55** out of 100
Submitted Nov 1 at 10:10am
This attempt took 9 minutes.

Question 1 — 5 / 5 pts

In the buffer manager, the “dirty” flag of each frame is used to specify whether or not the frame is empty.

- ○ True
- ◉ False

Correct!

Question 2

5 / 5 pts

In the buffer manager, a “pinned” frame can be taken out only if no other frame is available

- True
- Correct! False

Question 3

5 / 5 pts

An ordered column can be indexed using either dense or sparse index. In this case, a disk block may hold more index entries in the case of the sparse index than that of the dense index.

- True
- Correct! False

Question 4

5 / 5 pts

Secondary indexes typically result in random I/Os whereas primary indexes typically result in sequential I/Os

- Correct! True
- False

Question 5

5 / 5 pts

An insert operation in a sequential file that results in creating an "overflow" block may lead to a change in the index entries

Correct!

- (●) True
- ( ) False

Question 6

5 / 5 pts

For multi-level indexes, all levels except the 1st level must be dense indexes

- ( ) True

Correct!

- (●) False

Question 7

0 / 20 pts

In buffer manager, assume the buffer pool consists of 5 frames, which are all initially empty. The replacement policy is LRU (Least Recently Used). "Read P_i" and Update "P_i" represent requests to read or update the content of disk page P_i, respectively.

The following sequence of disk page requests will results in how many disk I/Os in total?

Read P_1, Read P_2, Update P_1, Read P_3, Read P_8, Read P_7, Read P_6, Read P_2

rrect Answer

- ( ) 8

u Answered

- (●) 9

- ( ) 6

7

Question 8

20 / 20 pts

Assume a relation where the number of its data records is 1,000,000. An index is built on un-sorted column. Each disk block can store 50 data records or 500 index entries.

What is the size of the 2nd level of the index (in terms of disk blocks)?

5

2000

Correct!

4

6

Question 9

0 / 20 pts

According to the lecture slides, which of these statements is wrong about buffer manager.

The unit of reading and writing between the buffer pool and disk is a disk page

rrect Answer

The buffer manager may decide to evict multiple frames at the same time

ou Answered

A buffer frame can be pinned by multiple transactions

The buffer manager may deny serving a request and queue it for some time

Question 10

5 / 10 pts

Given a completely filled B+ tree index (using Alternative 2) on a hard disk with the following properties:

Alternative (2) means that it contains the search key value being indexed and the pointer, but no other values of the data records

Pointer Size: 8 Bytes

Key Size: 20 Bytes

Page Size: 1024 Bytes

How many keys can be stored in a leaf node in this tree?

[Select]

How many records can be indexed in this B+ tree with 3 levels, including the root node (assuming maximum occupancy)?

[Select]

Answer 1:

Correct!

36

Answer 2:

ou Answered

Correct Answer Not Shown

rrect Answer

49284

Quiz Score: **55** out of 100