|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:** | **Darin Soeung** |  | **myUTSA ID (*abc123*):** | **Iou957** |

**CS 3423 Extra Credit Problems: File I/O**

**Instructions:** **Take the last three digits of *your* *abc123*.** For example, if your *abc123* ID is nju590, use the numbers 590: this number will represent the value of , which you will use to complete each problem. You have one submission attempt on Blackboard – do not submit unless and ﻿﻿until﻿﻿﻿﻿﻿﻿﻿﻿﻿﻿ you are completely certain your answers are finalized. Do not ask for any subsequent / additional ﻿﻿submission attempts﻿﻿﻿﻿﻿﻿﻿﻿﻿﻿﻿﻿﻿﻿﻿﻿ or retries, as none will be provided.﻿﻿﻿﻿﻿﻿

*Important Note: Read all instructions very carefully. No makeup will be allowed because you misread the question or instructions. The problem descriptions / parameters are* ***not*** *all the same.  
  
Important Note 2: All sizes are expressed as* ***binary*** *sizes (for example, 1MB = 220 = 1,048,576 bytes), not decimal sizes (which, for example, 1MB = 106 = 1,000,000 bytes). For more information see [this website](http://www.dewassoc.com/kbase/hard_drives/binary_v_decimal_measurement.htm).*

|  |  |  |
| --- | --- | --- |
| **Problem** | **Points** | **Grade** |
| 1 | 4 |  |
| 2 | 4 |  |
| 3 | 4 |  |
| 4 | 4 |  |
| 5 | 4 |  |
|  |  |  |
| **TOTAL** | **20** |  |

**Problem 1**

**1.** How many *data blocks* are utilized for a file with GB of data? Assume 4K blocks.

**250871808 blocks**

**2.** How many *blocks of direct pointers* (blocks pointed to by indirect pointers) are necessary to reference the data blocks in question 1? Assume 4 byte addresses.

**244992 blocks**

**3.** How many *blocks of indirect pointers* (blocks pointed to by double indirect pointers) are necessary to reference the direct pointer blocks in question 2?

**240 blocks**

**4.** How many *blocks of double indirect pointers* (blocks pointed to a triple indirect pointer) are necessary to reference the indirect pointer blocks in question 3?

**1 block**

**5.** How many total blocks are needed (not including the inode)?

**251117041 blocks**

**Problem 2**

**1.** How many *data blocks* are utilized for a file with MB/ 1007 MB of data? Assume **8K** blocks.

**957+50 = 1007**

**128896 blocks**

**2.** How many *blocks of direct pointers* (blocks pointed to by indirect pointers) are necessary to reference the data blocks in question 1? Assume **8 byte** addresses.

**16112 blocks**

**3.** How many *blocks of indirect pointers* (blocks pointed to by double indirect pointers) are necessary to reference the direct pointer blocks in question 2?

**2014 blocks**

**4.** How many *blocks of double indirect pointers* (blocks pointed to a triple indirect pointer) are necessary to reference the indirect pointer blocks in question 3?

**252 blocks**

**5.** How many total blocks are needed (not including the inode)?

**147274 blocks**

**Problem 3**

**1.** How many *data blocks* are utilized for a file with MB = 857 MB of data? Assume 4K blocks.

**219392 blocks**

**2.** How many *blocks of direct pointers* (blocks pointed to by indirect pointers) are necessary to reference the data blocks in question 1? Assume 4 byte addresses.

**215 blocks**

**3.** How many *blocks of indirect pointers* (blocks pointed to by double indirect pointers) are necessary to reference the direct pointer blocks in question 2?

**1**

**4.** How many *blocks of double indirect pointers* (blocks pointed to a triple indirect pointer) are necessary to reference the indirect pointer blocks in question 3?

**None**

**5.** How many total blocks are needed (not including the inode)?

**219608 blocks**

**Problem 4**

**1.** How many *data blocks* are utilized for a file with of data? Assume 4K blocks.

4 TB = (4(1,099,511,627,776)) = 3814698 MB

3814698 – 957 = 3813741 MB (2^10) / 4 KB

**976562688 blocks**

**2.** How many *blocks of direct pointers* (blocks pointed to by indirect pointers) are necessary to reference the data blocks in question 1? Assume 4 byte addresses.

**953675 blocks**

**3.** How many *blocks of indirect pointers* (blocks pointed to by double indirect pointers) are necessary to reference the direct pointer blocks in question 2?

**932 blocks**

**4.** How many *blocks of double indirect pointers* (blocks pointed to a triple indirect pointer) are necessary to reference the indirect pointer blocks in question 3?

**1 block**

**5.** How many total blocks are needed (not including the inode)?

**976562688 blocks**

**Problem 5**

**1.** How many *data blocks* are utilized for a file with KB, 1914 KB of data? Assume 4K blocks.

**479 blocks**

**2.** How many *blocks of direct pointers* (blocks pointed to by indirect pointers) are necessary to reference the data blocks in question 1? Assume 4 byte addresses.

**1 block**

**3.** How many *blocks of indirect pointers* (blocks pointed to by double indirect pointers) are necessary to reference the direct pointer blocks in question 2?

**None**

**4.** How many *blocks of double indirect pointers* (blocks pointed to a triple indirect pointer) are necessary to reference the indirect pointer blocks in question 3?

**None**

**5.** How many total blocks are needed (not including the inode)?

**480 blocks**