**Wayne State University**

**CSC 4421 - Winter 2025**

**Computer Operating Systems Labs** **Lab**

**05 - File System**

Points Possible: 100

# Tasks ∗ (100 points)

For this Lab, create a single Microsoft Word .docx document or compile to .pdf. Name the file ”L06 aa0000” (replacing aa000 with your access ID). **Make sure the document has a .docx or .pdf file extension.** When you are ready to submit, submit only this document to blackboard, there is no need to place it in a folder or compress it with .zip.

**At the beginning of the document, list the following information:**

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CSC 4420

Winter 2025

Lab06

**For each of the following steps listed below:**

Label the number of each step / part of the assignment in your .docx document. (e.g., 1, 2, 3, ...)

Include a screenshot of your terminal output for each execution of *df* .

Indicate what is happening at each step, what is depicted in each screen shot.

Answer any and all questions.

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1. **[Screen Shot, Answer - Explanation]** *df* is a command that displays the amount of disk space available on the file system containing each file name argument. Read man page of *df* command. Run the command

*df* to find out how many disk blocks are available and how many are in use. Does the sum of these equals the total number of disk blocks on the disk? If not, explain why there is a difference.

A screenshot of a computer program

AI-generated content may be incorrect.

There are 132909588 available, and 843525608 used. The total is 976435196. The sum turned out to be equal with the total number of disk blocks on the disk.

1. Next run the command *df -i* to find out how many inodes are available and in use. **[Screen Shot]**   
   A computer screen shot of a program

   AI-generated content may be incorrect.
2. Now create a new file with just a few characters in it, and again run *df* and *df -i* commands. **[Screen Shot x2]**   
   A screenshot of a computer screen

   AI-generated content may be incorrect.
3. Explain the effect of creating this new file. **[Answer - Explanation]**

Creating the new file with some extra characters in it, lead to more available 1k-blocks and it increased drastically by 1000000. The number of Inodes being used on the other hand increased.

1. Now increase the size of this new file by entering a large number (*>* 5000) of characters, and again run df and df –i commands. Do you notice a difference? **[Screen Shot x2, Answer - Explanation]**   
   A screenshot of a computer

   AI-generated content may be incorrect.  
   For the 1k-blocks they still become more available but the number decreases by 10^4. The Inodes do not change at all.
2. Repeat the last step, this time entering (*>* 50*,*000) characters. **[Screen Shot x2, Answer - Explanation]**   
   A screenshot of a computer screen

   AI-generated content may be incorrect.
3. Repeat the last step, this time entering (*>* 500*,*000) characters. **[Screen Shot x2, Answer - Explanation]**   
   A screenshot of a computer

   AI-generated content may be incorrect.  
   8. Explain the effect of increasing the size of the new file. **[Answer - Explanation]**

Increasing the size of the file effects the 1k-blocks but not the iNode, the iNode is affected only when a file is created, iNode is a pointer for the file that was created. But still the decrease of the available iNode was not -1.

Grading:

1. (\*80 points) Five points for each **[Screen Shot]** and each **[Answer - Explanation]**. There are 16 total, for 80 points.
2. (\*20 points) For a complete solution (all 16 **[Screen Shot]** and **[Answer - Explanation]**), a document that is well formed, includes the specified information at the beginning of the document, and is saved with the appropriate file name and document type (.docx or .pdf).