Assignment-1

Operating System (CS341)

Department of CSE, IIT Patna

(Read all the instructions carefully and adhere to them.)

Date: 22-March-2021 Deadline: - 29-March-2021

Instructions:

1. Marking will be based on the correctness and soundness of the outputs.
2. Marks will be deducted in case of plagiarism.
4. You should zip all the required files and name the zip file as: roll_no.zip , eg. 1711cs01.zip.
5. Upload your assignment (the zip file) in the following link: https://www.dropbox.com/request/y3v5NfHLnAyWSvWln0CU

For any queries regarding this assignment contact:

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1. A certain computer system has the segmented paging architecture for virtual memory. The memory is byte addressable. Both virtual and physical address spaces contain 2^{16} bytes each. The virtual address space is divided into 8 non-overlapping equal size segments. The memory management unit (MMU) has a hardware segment table, each entry of which contains the physical address of the page table for the segment. Page tables are stored in the main memory and consists of 2 byte page table entries. What is the minimum page size in bytes so that the page table for a segment requires at most one page to store it? What is the division of virtual address?

2. Consider a machine with 64 MB physical memory and a 32 bit virtual address space. If the page size is 4 KB, what is the approximate size of the page table?

3. In a virtual memory system, size of virtual address is 32-bit, size of physical address is 30-bit, page size is 4 Kbyte and size of each page table entry is 32-bit. The main memory is byte addressable. Which one of the following is the maximum number of bits that can be used for storing protection and other information in each page table entry?

4. Consider a system using a multilevel paging scheme. The page size is 1 MB. The memory is byte addressable and the virtual address is 64 bits long. The page table entry size is 4 bytes.
   Find-
   How many levels of page table will be required?
   Give the divided physical address and virtual address.

5. Consider the following segment table-

Segment No.	Base	Length
0	1219	700
1	2300	14
2	90	100
3	1327	580
4	1952	96

Which of the following logical address will produce trap addressing error?

A. 0, 430
B. 1, 11
C. 2, 100
D. 3, 425
E. 4, 95

Calculate the physical address if no trap is produced.