**Fall 2021 CSC332,Sec M Quiz 3 100 Points 75 Min.**

**Submit your answers as an attachment and upload it** rather than directly typing your answers in BB system. Use  **Notepad or Word or Wordpad files**.

Q1. (50 Points) (Memory)

Consider the memory management scheme using paging.

Let T be the page frame number column in the page table. Assume that the page table for process 2 satisfies T[i]=2i+3 for all pages i.

Assume that the page size is 64 bytes.

Convert the **PHYSICAL ADDRESS 2000**  in process 2 to the corresponding **logical address**. All numbers here and in your answer are in decimal. **Show detailed calculations.**

Solution:

Page frame number = 2000/64 = 31

Offset = 2000 - 31\*64 = 16

2i+3 = 31, so i = 14

page number = 14

Logical address = 14\*64 + 16 = 896+16 = 912

Q2. (50 Points) (Threads)

Consider the following code. What is the **MAXIMUM** value printed? Give a **Scenario** for this value.

**NOTE: the scenario is critical. If the scenario is grossly wrong, then your answer is essentially a guess and you lose a lot of points.**

cobegin-coend are as discussed in slides.

Assume that **all** **the variables before cobegin are in heap; so they are shared** with the children threads.

As in slides, after coend is done (i.e., children thread have finished), the parent thread resumes execution.

int counter=0; //in heap.

**cobegin**

for (int i=0; i<1000; i++) for (int i=0; i<1000; i++)

counter++; counter = counter - 1; //WATCH OUT!!

**coend**

print(counter);

Answer:

MAX = 1000

Scenario:

|  |  |
| --- | --- |
| **Thread 1** | **Thread 2** |
| As part of counter++, Load value of  counter into R1  Then, i == counter == R1 == 0 |  |
|  | Finish the Iterations and then exit. |
| stores R1 into counter.  Increment i  then counter = i == 1  we do this (counter++; ¡++) 999 times.  Thus, counter == ¡ == 1000  Exit |  |

Parent thread prints 1000

Thread 1 starts first and then Thread 2 starts, finish the iterations and finish. After that, Thread 1 overwrites the Thread 2 values which gives the max value of 1000.