COMP-2660 Assignment 5

Due date: 7 March, 2021

Section 1

Question 1 (10 points)

1. Which instruction pushes all of the 32-bit general-purpose registers on the stack? (1 point)
2. Which instruction pushes the 32-bit EFLAGS register on the stack? (1 point)
3. Which instruction pops the stack into the EFLAGS register? (1 point)
4. What will be the final value in EAX after these instructions execute? (2 points)
   push 5
   push 6
   pop eax
   pop eax
5. The stack size can be changed at run time. (T/F) (2 points)
6. Suppose there were no PUSH instruction. Write a sequence of two other instructions that would accomplish the same as push eax. (3 points)

Question 2 (20 points)

1. An assembler (called NASM) permits the PUSH instruction to list multiple specific registers. Why might this approach be better than the PUSHAD instruction in MASM? Here is a NASM example: (4 points)
   PUSH EAX EBX ECX
2. Discuss the Runtime Stack using an example and briefly explain the operations which can be performed on this stack. (4 points)
3. Briefly explain what a Stack Overflow is in a system stack. (4 points)
4. Explain using an example how the stack push operation works. (4 points)
5. Explain using an example how the CALL and RET instructions work. (4 points)

Section 2: Programming

Problems (20 points)

- Write a program that generates and displays 20 random strings, each consisting of 10 capital letters A..Z. Hint: concepts of nested loop, stack, OFFSET operator along with RandomRange procedure

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Submission

- It is mandatory that students complete their own work and must be able to justify their answers when asked to do so by instructors and teaching staff
- Students are responsible for making sure that their assignments are received by or on the due dates.
- Submit the assignment ONLY on blackboard.
- Submissions by email will not be accepted.
- Add the following note at the beginning of your assignment: *"I confirm that I will keep the content of this assignment confidential. I confirm that I have not received any unauthorized assistance in preparing for or writing this assignment. I acknowledge that a mark of 0 may be assigned for copied work." + Name + SID*
- For Section 1, the file should be in word docx or pdf format.
- For Section 2 (programming assessment), submit your source code in .asm file (preferred) or .txt file. Include title, name, date, ID and description on the top of source code.

Additional Instructions for Programs

- Write your program in a .asm file on MS Visual Studio.
- Test and debug the program and make sure it runs without any issue before submission.
- Submit the *.asm file* or copy and paste your code into a *.txt file* and submit it.
- For the programs DO NOT SEND A PDF, A HANDWRITTEN PAPER, OR A ZIPPED FOLDER.
- Student may send a screen shot of the program execution.

Evaluation

- Any late submissions will lose 50% of the total mark and will be zero after the third day.
- Any programs submitted as PDF or handwritten notes, even if submitted on time, would receive an automatic zero.