# CSc 256 Chapter 9 Assignment

PDF or MSWord .docx files due on iLearn Monday 12/17/2018, 5pm
(no late submissions; 6% of your grade)

This is an individual project. Work on your own. All submissions *must* be typed. Submit via the iLearn submission link. [Both Word docx and pdf versions of this document available at iLearn.]

**Problem 1:**

Suppose we have a 4 KB direct-mapped data cache with 4-byte blocks.

a) Show how a 32-bit memory address is divided into tag, index and offset. Show clearly how many bits are in each field. (10 points)

b) How many total bits are there in this cache? (15 points)

c) Consider this address trace:

0x48014554
0x48014548
0x48014754
0x48034760
0x48014554
0x48014560
0x48014760
0x48014554

For the cache in Problem 1a/b, for each address in the above trace, show the tag, index and offset in binary. Indicate whether each reference is a hit or a miss. What is the miss rate? (25 points)

**Problem 2:**

Suppose we have a 32KB direct-mapped data cache with 32-byte blocks.

a) Show how a 32-bit memory address is divided into tag, index and offset. Show clearly how many bits are in each field. (10 points)

b) How many total bits are there in this cache? (15 points)

c) For the cache in Problem 2a/b, for each address in the trace in Problem 1c, show the tag, index and offset in binary. Indicate whether each reference is a hit or a miss. What is the miss rate? (25 points)