Disclaimer:

1. The solutions are just for your reference. They may contain some mistakes. DO TRY to solve the problems by yourself before checking the solutions. Please also pay attentions to the course website for the updates.

2. Try not to use pseudoinstructions for any exercises that ask you to produce MIPS code. Your goal should be to learn the real MIPS instruction set, and if you are asked to count instructions, your count should reflect the actual instructions that will be executed and not the pseudoinstructions.

Selected exercise for Chapter 3 from 5th edition: 3.4, 3.5, 3.9, 3.10, 3.11

3.4 753

4365	100 011 110 101
- 3412	- 011 100 001 010
0753	000 111 101 011

3.5

More information for sign-magnitude addition/substraction

http://www.cs.uwm.edu/classes/cs315/Bacon/Lecture/HTML/ch04s11.html

Eight Conditions for Signed-Magnitude Addition/Subtraction

Operation	**ADD Magnitudes**	**SUBTRACT Magnitudes**		
		A > B	**A < B**	**A = B**
(+A) + (+B)	**+ (A + B)**			
(+A) + (-B)		**+ (A – B)**	**- (B – A)**	**+ (A – B)**
(-A) + (+B)		**- (A – B)**	**+ (B – A)**	**+ (A – B)**
(-A) + (-B)	**- (A + B)**			
(+A) - (+B)		**+ (A – B)**	**- (B – A)**	**+ (A – B)**
(+A) - (-B)	**+ (A + B)**			
(-A) - (+B)	**- (A + B)**			

(-A) - (-B)		- (A – B)	+ (B – A)	+ (A – B)

$4365_8 = (-)\ 0365_8 = -\ 245_{10}$
$3412_8 = (+)3412_8 = 1802_{10}$
$-245_{10}-1802_{10} = -2047_{10} = -3777_8 = 7777_8$ when written in octal

I would like to thank 溫梓傑 for finding errors in this solution.

3.9

151 = 1001 0111. It represents -105 in two's complement format
214 = 1101 0110. It represents -42 in two's complement format
-105 – 42=-128 in decimal

3.10

151 = 1001 0111. It represents -105 in two's complement format
214 = 1101 0110. It represents -42 in two's complement format
-105 –(- 42) = -63 in decimal

3.11

151 + 214= 365.
Since unsigned 8-bit integers range is 0 ~255, the result is 255 since saturating arithmetic is used.