Week 15 - Spring 2014
Solutions

Exercise 1.1

a) We can use expression (1) to solve for equilibrium level of

$Y^{*} = 4(200 + 200 + 300 - 100) - 3(200) = 1800$

Then,
C= 200+.75(1800-200)=1400
Sp= -200+(1-.75)(1800-200)=200

We can also check if the model is well defined by computing: $I - S_g + S_p = KI$. Then,
$200 - (200 - 100) = 100$

b) We have two different goals: achieve full employment level of output *Yfe*=2000 ($\Delta Y = (2000 - 1800) = 200$) and equilibrate government budget ($\Delta S_g = 100$)
Therefore, we need to solve the following system of two equations in two unknowns:

$200 = 4\Delta G - 3\Delta T$

$100 = \Delta T - \Delta G$

Then $\Delta T = 600$ and $\Delta G = 500$. So the new levels of G and T are 800 each.

Exercise 1.2

The new multiplier is:

$$Y = \frac{1}{1 - c(1 - t) - i + m}[C_0 - c(T - TR) + I_0 + G + X - M_0]$$

Notice that our multiplier is more complex now because we have more terms that depend on income.

a) If government increases G by $100, the equilibrium GDP will increase $200 since the expenditure multiplier is 2.

b) Initial GDP is Y= 2*(200-.8*100+300+600+480-250) = 2*1250 = 2500. When m =.3, the multiplier becomes 1.79, so GDP is Y = 1.79*1250 = 2232.15

c) The new policy implies TR=.2M=.2(250+.3Y)= 50+.06Y. Also notice that the multiplier becomes $\frac{1}{1 - .8(1 - .2 + .06) - .1 + .3} = 1.9531$ and the Autonomous part is $1250 + .8(50) = 1290$

Therefore, Y=1.9531*1290=2519.5

Exercise 2.1

a- Since they only have to hold $100 in reserves, instead of $200, banks now lend out $100 of their reserves. Whoever borrows the $100 will deposit in a bank, which will lend out $100*(1-.1)=$90. Whoever borrows the $90 will put it inot a bank, which will lend out $81, and so on. Overall, deposits increase by $100/.1=$1000.

b- Again, banks lend out $100 of their reserves. Whoever borrows the $100 will keep $50 in cash and deposit $50 in a bank. The bank will lend out $50*.9=$45. Whoever borrows the $45 will keep $22.5 in cash and deposit $22.5 in a bank, and so on.

Exercise 2.2

OM purchase of $100 million by the Fed increases banks' reserves as the Fed credits their accounts with additional reserves (i.e. monetary base goes up by $100). Since those are extra reserves beyond the minimum requirements, banks lend out $100 million. Same analysis as before….

Exercise 2.3

Federal Reserve		Banks	
Assets	Liabilities	Assets	Liabilities
Treasury bills -100	Monetary base -100	Treasury bills 100	Deposits -500
		Reserves -100	
		Loans -500	