Paper: CIA.Accting
Problem: 01
Problem Type: Calculate the change in (NI, OCI, Eq) due to the change in bond yield as given below.

Formula	chg(NI)	=	chg(PV(FVO))	-	chg(APV(Liabs))
	chg(OCI)	=	chg(PV(AFS))		
Formula	chg(Eq)	=	chg(NI)	+	chg(OCI)

Given:

data as of CY	2014				
original bond yield:	3.50%				
new bond yield:	4.00%				
PV(@ 3.5%) for FVO bonds:	**38,987**				
PV(@ 3.5%) for AFS bonds:	**14,790**				
PV(@ 4%) for FVO bonds:	**38,730**				
PV(@ 4%) for AFS bonds:	**14,584**				
					see page
NU (Net Unpaid):	32,000				
MfAD(clms):	12.00%		APV(NU(@ 3.5%):	**33,757**	<= 04b
MfAD(inv):	50	bps	APV(NU(@ 4%):	**33,435**	<= 05b

*** other bond info: next page**
*** original + MfAD(inv) o.w. lots of extra calcs**

	% cum pd
at end of 2015	30%

chg(NI) =	65
chg(OCI) =	-206
chg(Eq) =	-141

chg(NI)	=	-257	-	-322	=	65		
chg(OCI)	=				=	-206		
						-141	=	chg(Eq)

Paper: CIA.Accting
Problem: 01a
Problem Type: Calculate the PV of the cash flows for each class of bond at the **ORIGINAL** bond yield

Concept:

PRIOR TO maturity date:	CF(bond)	=	coupon
AT maturity date:	CF(bond)	=	coupon + (par value)
where	coupon	=	(coupon rate) x (par value)

Given:

PV date:	2014 * yr-end
bond yield:	3.50%

	bond #1	bond #2	bond #3	bond #4	
class	FVO	FVO	FVO	AFS	
maturity	2015	2015	2016	2017	* yr-end
coupon rt	3.25%	4.25%	3.25%	3.00%	
# coupons/yr	1	1	1	1	
par value	12,000	12,000	15,000	15,000	

Assume: All pmts are made AT THE END of the year

PV(FVO) = 38,987 PV(AFS) = 14,790

timing	bond #1	bond #2	bond #3	bond #4
2015	12,390	12,510	488	450
2016			15,488	450
2017				15,450
2018				

Totals	
FVO	AFS
25,388	450
15,488	450
0	15,450
0	

Discounting	
FVO	AFS
24,529	435
14,458	420
0	13,935
0	
38,987	14,790

Paper: CIA.Accting
Problem: 01b
Problem Type: Calculate the PV of the cash flows for each class of bond at the **NEW** bond yield

Concept:

PRIOR TO maturity date:	CF(bond)	=	coupon
AT maturity date:	CF(bond)	=	coupon + (par value)
where	coupon	=	(coupon rate) x (par value)

Given:

PV date:	2014 * yr-end
bond yield:	4.00%

	bond #1	bond #2	bond #3	bond #4	
class	FVO	FVO	FVO	AFS	
maturity	2015	2015	2016	2017	* yr-end
coupon rt	3.25%	4.25%	3.25%	3.00%	
# coupons/yr	1	1	1	1	
par value	12,000	12,000	15,000	15,000	

Assume: All pmts are made AT THE END of the year

PV(FVO) = 38,730 PV(AFS) = 14,584

timing	bond #1	bond #2	bond #3	bond #4	Totals FVO	Totals AFS	Discounting FVO	Discounting AFS
2015	12,390	12,510	488	450	25,388	450	24,411	433
2016			15,488	450	15,488	450	14,319	416
2017				15,450	0	15,450	0	13,735
2018					0		0	
							38,730	14,584

Paper: CIA.Accting
Problem: 02a
Problem Type: Calculate APV(NU) at **ORIGINAL** bond yield

Note: This APV calc works slightly differently from MfAD:

MfAD: - for given **AY**, use (unpd at end of **CY**, pmt pattern) to project future pmts
assume pmts are made **mid-year**
pull **projected pmts** back to end of **CY** (0.5, 1.5, 2.5,…)

Here: - for given **CY**, use (unpd at end of **CY**, pmt pattern) to project future pmts
pmts are made **at end of year**,
pull **projected pmts** back to end of given **CY** (1, 2, 3,…)

Assume: pmt are made at end-of-yr

Given:

for AY:	2014			% cum pd
NU at 12 mths:	32,000		at end of 2015	30%
CU at 12 mths:	0		at end of 2016	70%
i:	3.5%		at end of 2017	100%
MfAD(inv):	50	bps		
MfAD(clms):	12%			
MfAD(re):	0%			

APV(NU(@3.5%) 33,757

timing	% pd in period		NU		3.5% disct'ing		3.5% NU(@i)		3.00% disct'ing		3.00% NU(@i')
2015	0.300	x	32,000	/	1.035	=	9,275	|	1.030	--->	9,320
2016	0.400	x	32,000	/	1.071	=	11,949	|	1.061	--->	12,065
2017	0.300	x	32,000	/	1.109	=	8,659	|	1.093	--->	8,785
check	1.000						29,883				30,171
						x	12%	*MfAD(clms)*			
							3,586				

Now, SUM the beige highlighted cells to get APV: 33,757

Paper: CIA.Accting
Problem: 02b
Problem Type: Calculate APV(NU) at **NEW** bond yield

Note: This APV calc works slightly differently from MfAD:

MfAD: - for given **AY**, use (unpd at end of **CY**, pmt pattern) to project future pmts
assume pmts are made **mid-year**
pull **projected pmts** back to end of **CY** (0.5, 1.5, 2.5,…)

Here: - for given **CY**, use (unpd at end of **CY**, pmt pattern) to project future pmts
pmts are made **at end of year**,
pull **projected pmts** back to end of given **CY** (1, 2, 3,…)

Assume: pmt are made at end-of-yr

Given:

for AY:	2014			% cum pd
NU at 12 mths:	32,000		at end of 2015	30%
CU at 12 mths:	0		at end of 2016	70%
i:	4.0%		at end of 2017	100%
MfAD(inv):	50	bps		
MfAD(clms):	12%			
MfAD(re):	0%			

APV(NU(@4%) 33,435

timing	% pd in period		NU		4.0% disct'ing		4.0% NU(@i)		3.50% disct'ing		3.50% NU(@i')
2015	0.300	x	32,000	/	1.040	=	9,231	|	1.035	--->	9,275
2016	0.400	x	32,000	/	1.082	=	11,834	|	1.071	--->	11,949
2017	0.300	x	32,000	/	1.125	=	8,534	|	1.109	--->	8,659
check	1.000						29,599				29,883
						x	12%	*MfAD(clms)*			
							3,552				

Now, SUM the beige highlighted cells to get APV: 33,435