

DO NOT LOSE POINTS ON SPREADSHEET ASSIGNMENT 3!!

Each group of columns is to be a flexible tool for computing value for a bond with up to 10 years = 20 half-years remaining to maturity. We should be able to change the number of years remaining and have the sheet show correct values in the right spots, and blank spaces in the right spots for attractive formatting. Note in the listing of cell contents below there always should be formulas with IF statements in cells corresponding to all of time periods 1 – 20. **Do not erase those IF statement formulas for periods after a maturity date occurring in less than 20 half-years.** In the case below 2 years = 4 half-years remain; notice the IF statement formulas in cells going down to 20 periods.

Par Value	1000	
Coupon Rate	0.09	
Effective Yield to Maturity	0.1025	
Periodic Rate	= $(1+B14)^{0.5}-1$	
Stated Annual Rate (APR)	= $B15*2$	
Part A		
Years until maturity	2	
Half-years remaining	= $B19*2$	
<u>PV of Par Value to be Received at Maturity</u>		
Par Value	PV Factor	PV of Par
=\$B\$12	= $1/(1+$B$15)^{B20}$	= $A24*B24$
<u>PV of Expected Interest Payments</u>		
Period	Cash Flow	PV of CF
1	= $IF(A28<=B$20,B12*(\B13/2)," ")$	= $IF(A28<=B$20,B28*1/(1+B15)^{A28}," ")$
2	= $IF(A29<=B$20,B12*(\B13/2)," ")$	= $IF(A29<=B$20,B29*1/(1+B15)^{A29}," ")$
3	= $IF(A30<=B$20,B12*(\B13/2)," ")$	= $IF(A30<=B$20,B30*1/(1+B15)^{A30}," ")$
4	= $IF(A31<=B$20,B12*(\B13/2)," ")$	= $IF(A31<=B$20,B31*1/(1+B15)^{A31}," ")$
5	= $IF(A32<=B$20,B12*(\B13/2)," ")$	= $IF(A32<=B$20,B32*1/(1+B15)^{A32}," ")$
6	= $IF(A33<=B$20,B12*(\B13/2)," ")$	= $IF(A33<=B$20,B33*1/(1+B15)^{A33}," ")$
7	= $IF(A34<=B$20,B12*(\B13/2)," ")$	= $IF(A34<=B$20,B34*1/(1+B15)^{A34}," ")$
8	= $IF(A35<=B$20,B12*(\B13/2)," ")$	= $IF(A35<=B$20,B35*1/(1+B15)^{A35}," ")$
9	= $IF(A36<=B$20,B12*(\B13/2)," ")$	= $IF(A36<=B$20,B36*1/(1+B15)^{A36}," ")$
10	= $IF(A37<=B$20,B12*(\B13/2)," ")$	= $IF(A37<=B$20,B37*1/(1+B15)^{A37}," ")$
11	= $IF(A38<=B$20,B12*(\B13/2)," ")$	= $IF(A38<=B$20,B38*1/(1+B15)^{A38}," ")$
12	= $IF(A39<=B$20,B12*(\B13/2)," ")$	= $IF(A39<=B$20,B39*1/(1+B15)^{A39}," ")$
13	= $IF(A40<=B$20,B12*(\B13/2)," ")$	= $IF(A40<=B$20,B40*1/(1+B15)^{A40}," ")$
14	= $IF(A41<=B$20,B12*(\B13/2)," ")$	= $IF(A41<=B$20,B41*1/(1+B15)^{A41}," ")$
15	= $IF(A42<=B$20,B12*(\B13/2)," ")$	= $IF(A42<=B$20,B42*1/(1+B15)^{A42}," ")$
16	= $IF(A43<=B$20,B12*(\B13/2)," ")$	= $IF(A43<=B$20,B43*1/(1+B15)^{A43}," ")$
17	= $IF(A44<=B$20,B12*(\B13/2)," ")$	= $IF(A44<=B$20,B44*1/(1+B15)^{A44}," ")$
18	= $IF(A45<=B$20,B12*(\B13/2)," ")$	= $IF(A45<=B$20,B45*1/(1+B15)^{A45}," ")$
19	= $IF(A46<=B$20,B12*(\B13/2)," ")$	= $IF(A46<=B$20,B46*1/(1+B15)^{A46}," ")$
20	= $IF(A47<=B$20,B12*(\B13/2)," ")$	= $IF(A47<=B$20,B47*1/(1+B15)^{A47}," ")$
Bond Value		= $SUM(C24:C47)$

Yet the output (see below) will show values only for four periods, and then blanks in the rows corresponding to periods 5 – 20. Thus we have nice formatting, with blanks shown for all periods after the bond matures (the IF statements are saying: IF the bond has already matured, then show the dollar amounts as a blank). But if someone erased all the IF statements below the row corresponding to period 4 we no longer could return and enter a remaining period greater than 2 years = 4 half-years and get a correct answer. We want to be able to change 2 remaining years, shown below ...

Par Value	\$1,000.00	
Coupon Rate	9.00%	
Effective Yield to Maturity	10.25%	
Periodic Rate	5.00%	
Stated Annual Rate (APR)	10.00%	
Part A		
Years until maturity	2	
Half-years remaining	4	
<u>PV of Par Value to be Received at Maturity</u>		
Par Value	PV Factor	PV of Par
\$1,000.00	0.822702475	\$822.70
<u>PV of Expected Interest Payments</u>		
Period	Cash Flow	PV of CF
1	\$45.00	\$42.86
2	\$45.00	\$40.82
3	\$45.00	\$38.87
4	\$45.00	\$37.02
5		
6		
7		
8		
9		
10		
11		
12		
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15		
16		
17		
18		
19		
20		
Bond Value		<u>\$982.27</u>

... to 10 years and have the result automatically change to what is shown here, without having to re-program any cells.

Years until maturity	10	
Half-years remaining	20	
<u>PV of Par Value to be Received at Maturity</u>		
Par Value	PV Factor	PV of Par
\$1,000.00	0.376889483	\$376.89
<u>PV of Expected Interest Payments</u>		
Period	Cash Flow	PV of CF
1	\$45.00	\$42.86
2	\$45.00	\$40.82
3	\$45.00	\$38.87
4	\$45.00	\$37.02
5	\$45.00	\$35.26
6	\$45.00	\$33.58
7	\$45.00	\$31.98
8	\$45.00	\$30.46
9	\$45.00	\$29.01
10	\$45.00	\$27.63
11	\$45.00	\$26.31
12	\$45.00	\$25.06
13	\$45.00	\$23.86
14	\$45.00	\$22.73
15	\$45.00	\$21.65
16	\$45.00	\$20.62
17	\$45.00	\$19.63
18	\$45.00	\$18.70
19	\$45.00	\$17.81
20	\$45.00	\$16.96
Bond Value		<u>\$937.69</u>

Why do people erase IF statements?? Usually because they are getting some kind of odd message (ERROR or NAME perhaps) in the cells corresponding to time periods after the maturity date, instead of getting the intended nice, clean blanks. And the total Bond Value cell may also show that odd message or something else other than the correct value. Why do they get those odd messages? Because something is typed incorrectly. Often it is that the **quotation marks** are in a weird font, and that can be because they tried to copy the IF statements from the instruction PDF and paste into Excel, even though the instructions warn not to do that – because you will get those odd messages!! (At least try re-typing the quotation marks in one IF statement and, if that corrects the problem, copy and paste to other cells in the same column.) See the output below – I got the desired incorrect result by typing the first IF statement in Word and copying/pasting into one Excel cell, and then pasting to other rows in the same column of cells; Word-based quotation marks are the culprit. Note that for each period before the bond has matured the correct dollar values show, because the program never gets far enough into the IF statement for the bad quotation marks at the end to create a problem.

Years until maturity	6	
Half-years remaining	12	
<u>PV of Par Value to be Received at Maturity</u>		
Par Value	PV Factor	PV of Par
\$1,000.00	0.556837418	\$556.84
<u>PV of Expected Interest Payments</u>		
Period	Cash Flow	PV of CF
1	\$45.00	\$42.86
2	\$45.00	\$40.82
3	\$45.00	\$38.87
4	\$45.00	\$37.02
5	\$45.00	\$35.26
6	\$45.00	\$33.58
7	\$45.00	\$31.98
8	\$45.00	\$30.46
9	\$45.00	\$29.01
10	\$45.00	\$27.63
11	\$45.00	\$26.31
12	\$45.00	\$25.06
13	#NAME?	#NAME?
14	#NAME?	#NAME?
15	#NAME?	#NAME?
16	#NAME?	#NAME?
17	#NAME?	#NAME?
18	#NAME?	#NAME?
19	#NAME?	#NAME?
20	#NAME?	#NAME?
Bond Value		<u>#NAME?</u>

Erasing IF statements in the post-maturity cells can make a paper copy of the output look nice and clean, so a paper copy might mask errors that will clearly show in an electronic copy. Part of the grading process for Excel files will be looking at your cell formulas. Points will be taken off for steps like erasing key IF statements that might make a limited set of cases look cosmetically better, at least on a paper copy, while destroying the sheet's usefulness as a flexible tool for computing bond values. The assignment has you looking at specific cases involving 8, 4, 2, and 1 years remaining to maturity, but in grading I will enter different time periods up to 10 years in the various groups of columns and see whether answers are computed correctly. Get full points!! Think and type carefully, use the detailed instructions if they are helpful, **do not cut corners by trying to copy/paste important formulas instead of typing them directly into Excel**, and ask questions if you encounter difficulties!!