Reading: Odomirok.19-RBC (RBC - 15F.17 practice 01) 1a-Question
Model: 2015.Fall #17
Problem Type: Calculate RBC charge R_1.

Given

#	Unaffiliated Bonds NAIC Class 02	Unaffiliated Common Stock	Assets subject to Asset Concentration
1	28,000	0	28,000
2	0	24,100	24,100
3	0	13,300	13,300
4	11,700	0	11,700
5	7,400	0	7,400
6	0	5,900	5,900
7	0	3,800	3,800
8	0	3,500	3,500
9	2,500	0	2,500
10	0	1,700	1,700
11	700	300	1,000
12	700	0	700
	51,000	**52,600**	**103,600**

Notation	
basic	basic R_1 charge
BSC	Bond **Size** Charge
BSF	*Bond **Size** Factor*
ACC	Asset Contentration Charge
R_1 =	basic + BSC + ACC

* Issuers are **sorted** from largest to smallest.

Bond Size Adjustment Factor WEIGHTS

bond count	# issuers	weights
1-50	6	2.5
51-100	0	1.3
101-400	0	1.0
> 400	0	0.9

* BSF = sumproduct(issuers, weights) / sum(issuers) - 1
(shout-out to AT!)

RBC Factors by Asset Category

Asset Category	RBC Factor
Unaffiliated Bonds Class 02	0.01
Unaffiliated Common Stock	0.15

Find Calculate the RBC charge R_1.

R1	=	basic	+	BSC	+	ACC
	=	510	+	765	+	496
	=	1,771	**<== final answer**			

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basic = **SUM over n:** [(total fixed income assets of category i) x (RBC factor for category i)]
= (total bonds of class 02) x (RBC factor for class 02)
= 51,000 x 0.01
= 510

BSC = BSF x basic
= 1.5 x 510.0
= 765

ACC = (total bonds from TOP 10 issuers) x (RBC factor)
= 49,600 x 0.01
= 496

Notes on the BSF term (Bond Size Factor)

==> Since we have at most 12 issuers in this problem, BSF always equals 1.5
==> In general BSF = sumproduct(# issuers, weights) / sum(# issuers) - 1
==> if (bond count) > 1300 then the portfolio will receive a discount to their RBC charge for bonds
(shout-out to AT!)
==> BSF decreases as *bond count* increases

Reading: Odomirok.19-RBC (RBC - 15F.17 practice 02) 2a-Question
Model: 2015.Fall #17
Problem Type: Calculate RBC charge R_1.

Given

#	Unaffiliated Bonds NAIC Class 02	Unaffiliated Common Stock	Assets subject to Asset Concentration
1	11,500	11,500	23,000
2	0	13,800	13,800
3	0	11,200	11,200
4	0	5,600	5,600
5	2,100	1,500	3,600
6	0	2,200	2,200
7	1,000	800	1,800
8	0	1,500	1,500
9	0	1,100	1,100
10	0	800	800
11	0	600	600
12	0	500	500
	14,600	**51,100**	**65,700**

Notation	
basic	basic R_1 charge
BSC	Bond **Size** Charge
BSF	*Bond **Size** Factor*
ACC	Asset Contentration Charge
R_1 =	basic + BSC + ACC

* Issuers are **sorted** from largest to smallest.

Bond Size Adjustment Factor WEIGHTS

bond count	# issuers	weights
1-50	3	2.5
51-100	0	1.3
101-400	0	1.0
> 400	0	0.9

* BSF = sumproduct(issuers, weights) / sum(issuers) - 1
(shout-out to AT!)

RBC Factors by Asset Category

Asset Category	RBC Factor
Unaffiliated Bonds Class 02	0.01
Unaffiliated Common Stock	0.15

Find Calculate the RBC charge R_1.

R1	=	basic	+	BSC	+	ACC
	=	146	+	219	+	146
	=	511	**<== final answer**			

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basic = **SUM over n:** [(total fixed income assets of category i) x (RBC factor for category i)]
= (total bonds of class 02) x (RBC factor for class 02)
= 14,600 x 0.01
= 146

BSC = BSF x basic
= 1.5 x 146.0
= 219

ACC = (total bonds from TOP 10 issuers) x (RBC factor)
= 14,600 x 0.01
= 146

Notes on the BSF term (Bond Size Factor)

==> Since we have at most 12 issuers in this problem, BSF always equals 1.5
==> In general BSF = sumproduct(# issuers, weights) / sum(# issuers) - 1
==> if (bond count) > 1300 then the portfolio will receive a discount to their RBC charge for bonds
(shout-out to AT!)
==> BSF decreases as *bond count* increases