


Screencasts

Quiz 3 and Assignment 3


 Reading: Quiz 3
Instructions
2 min

 Quiz: Quiz 3
5 questions


 Reading: Quiz 3 solutions and explanations
10 min

 **Reading: Assignment 3**
2h

 Video: More about the OFFSET function
7 min

 **Video:** Assignment 3
preview and instructions
1 min

 Discussion Prompt:
Assignment 3 discussion
10 min

 **Quiz: Assignment 3 submission**
2 questions

 Reading: Week 4 files
10 min

Quiz 3 solutions and explanations

Quiz 3 Solutions & Explanations

Everyday Excel, Part 2

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Hello there! This document is meant to provide clear explanations for the Quiz 3 questions (not the in-video quizzes since they have explanations already). I do NOT provide feedback during the quiz (like I do for the screencasts) because a learner could just guess, obtain the correct answers, then put them back into the quiz and get 100%!

This document is purely for you to learn more and to correct your misconceptions about the material. If you view this document soon after you take the quiz to see why you missed a certain question, it will serve as a great learning tool!

PLEASE DO NOT SHARE THIS DOCUMENT WITH ANYONE! Using this document to complete Quiz 3 is a violation of Coursera's Honor Code (a.k.a. cheating).

NOTE that the order of the answers on Coursera are random and likely different from the order shown here (in general but not always, I like to start with the correct answers followed by the incorrect ones).

Question 1:

The purchase cost of a piece of equipment is \$14,000, its useful life is 7 years, and its salvage value is \$3,000. We choose a certain depreciation method and after the 4th year the value of the asset is \$5,357.14. What depreciation method have we used?

Correct answer: **Sum-of-years method**

Explanation: The best way to solve this problem is to set up depreciation schedules for each of the 3 methods (it's not the unit of production method because we aren't given any information with respect to units made each year).

	A	B	C	D	E	F	G
1	Purchase:	\$14,000.00					
2	Salvage:	\$ 3,000.00					
3	Lifetime:	7					
4							
5		SLN		SYD		DDB	
6	Year	D	value	D	value	D	value
7	1	\$1,571.43	\$12,428.57	\$2,750.00	\$11,250.00	\$4,000.00	\$10,000.00
8	2	\$1,571.43	\$10,857.14	\$2,357.14	\$8,892.86	\$2,857.14	\$7,142.86
9	3	\$1,571.43	\$9,285.71	\$1,964.29	\$6,928.57	\$2,040.82	\$5,102.04
10	4	\$1,571.43	\$7,714.29	\$1,571.43	\$5,357.14	\$1,457.73	\$3,644.31
11	5	\$1,571.43	\$6,142.86	\$1,178.57	\$4,178.57	\$644.31	\$3,000.00
12	6	\$1,571.43	\$4,571.43	\$785.71	\$3,392.86	\$0.00	\$3,000.00
13	7	\$1,571.43	\$3,000.00	\$392.86	\$3,000.00	\$0.00	\$3,000.00

The formulas in the various cells are shown here:

	A	B	C	D	E	F	G
1	Purchase:	14000					
2	Salvage:	3000					
3	Lifetime:	7					
4							
5		SLN		SYD		DDB	
6	Year		value		value		value
7	1	=SLN(cost,salvage,life)	=C8-B7	=SYD(cost,salvage,life,#=C8-D7		=DDB(cost,salvage,life,A7)	=cost-F7
8	2	=SLN(cost,salvage,life)	=C8-B8	=SYD(cost,salvage,life,#=E8-D8		=DDB(cost,salvage,life,A8)	=G7-F8
9	3	=SLN(cost,salvage,life)	=C8-B9	=SYD(cost,salvage,life,#=E8-D9		=DDB(cost,salvage,life,A9)	=G8-F9
10	4	=SLN(cost,salvage,life)	=C9-B10	=SYD(cost,salvage,life,#=E9-D10		=DDB(cost,salvage,life,A10)	=G9-F10
11	5	=SLN(cost,salvage,life)	=C10-B11	=SYD(cost,salvage,life,#=E10-D11		=DDB(cost,salvage,life,A11)	=G10-F11
12	6	=SLN(cost,salvage,life)	=C11-B12	=SYD(cost,salvage,life,#=E11-D12		=DDB(cost,salvage,life,A12)	=G11-F12
13	7	=SLN(cost,salvage,life)	=C12-B13	=SYD(cost,salvage,life,#=E12-D13		=DDB(cost,salvage,life,A13)	=G12-F13

As can be seen, with the sum-of-years method, the value at the end of the 4th year is \$5,357.

Question 2:

Your company is required to purchase a new safety system, which costs \$100,000 to purchase and install, has a lifetime of 10 years, and has no salvage value. It will require an overhaul in five years at a cost of \$30,000. Annual Operating and Maintenance costs (O&M) will be \$15,000 per year for the first five years, and will increase to \$25,000 per year for the remaining life (including the 10th year). Assume that the annual interest rate is 6%.

What is the net present value of this system? Treat yearly depreciation as positive cash flows, and use straight-line depreciation.

Correct answer: \$(190.695)

Explanation: The best way to solve this is to set up a yearly cash flow table:

	A	B	C	D	E	F
1	Year	Expenses	Dep	Overhaul	O&M	Total
2	0	\$ (100,000.00)				\$ (100,000.00)
3	1		\$ 10,000.00		\$ (15,000.00)	\$ (5,000.00)
4	2		\$ 10,000.00		\$ (15,000.00)	\$ (5,000.00)
5	3		\$ 10,000.00		\$ (15,000.00)	\$ (5,000.00)
6	4		\$ 10,000.00		\$ (15,000.00)	\$ (5,000.00)
7	5		\$ 10,000.00	\$ (30,000.00)	\$ (15,000.00)	\$ (35,000.00)
8	6		\$ 10,000.00		\$ (25,000.00)	\$ (15,000.00)
9	7		\$ 10,000.00		\$ (25,000.00)	\$ (15,000.00)
10	8		\$ 10,000.00		\$ (25,000.00)	\$ (15,000.00)
11	9		\$ 10,000.00		\$ (25,000.00)	\$ (15,000.00)
12	10		\$ 10,000.00		\$ (25,000.00)	\$ (15,000.00)
13						
14					NPV	\$ (190,695.41)

The table outlines all the expenses each year, and we've summed all the cash flows for each year in column F. We can then just use the NPV formula to calculate the NPV:

=NPV(0.06,F3:F12)+F2

Note that we have added in any present values (cell **F2**) outside the **NPV** function.

Question 3:

Which of the following options has a higher present value? Assume an annual interest rate of 4.5%.

Option A: Your friend will give you \$2000 in 2 years from now.

Option B: Your friend gives you \$1000 today, \$500 in each of the next 3 years (years 1, 2, and 3) but then you have to give them \$1000 in 4 years.

Option C: You lend your friend \$4000 today, but he agrees to pay you back \$6500 in 2 years from now.

Correct answer: **Option C**

Explanation: We can calculate the present value of all of the options in Excel:

	A	B	C	D
1				
2	int	4.5%		
3				
4	Option A	\$1,831.46		
5				
6	Option B	Year	Cash flow	PV
7		0	\$ 1,000.00	\$ 1,000.00
8		1	\$ 500.00	\$ 478.47
9		2	\$ 500.00	\$ 457.86
10		3	\$ 500.00	\$ 438.15
11		4	\$ (1,000.00)	\$ (838.56)
12			NPV:	\$1,535.92
13			or...	\$1,535.92
14				
15	Option C	\$1,952.24		
16				

The formulas used are shown here:

	A	B	C	D
1				
2	int	0.045		
3				
4	Option A	=NPV(int,0,2000)		
5				
6	Option B	Year	Cash flow	PV
7		0	1000	=C7/(1+int)^B7
8		1	500	=C8/(1+int)^B8
9		2	500	=C9/(1+int)^B9
10		3	500	=C10/(1+int)^B10
11		4	-1000	=C11/(1+int)^B11
12			NPV:	=SUM(D7:D11)
13			or...	=1000+500/(1+int)^1+500/(1+int)^2+500/(1+int)^3-1000/(1+int)^4
14				
15	Option C	=-4000+NPV(int,0,6500)		
16				

Option C has the highest present value of \$1,952.

Question 4:

You invest \$12,000 in startup costs (today) to start a part time food truck that sells ples. Your projected sales in the next 5 years are: \$2000 in year 1, \$3000 in year 2, and \$4000 in years 3 through 5. What is the IRR after 5 years? Leave your answer as a percentage, omit the % sign, and round your answer to the nearest tenth of a percentage (e.g., XX.X).

Correct answer: **11.5**

Explanation: We can just set up a cash flow table in Excel and use the IRR function:

	A	B	C
1			
2		Year	Cash flow
3		0	-12000
4		1	2000
5		2	3000
6		3	4000
7		4	4000
8		5	4000
9			11.50%

The formula in cell **C9** is: **=IRR(C3:C8)**

Question 5:

Which of the following are TRUE statements regarding the material in this week? Select all that apply. (HINT: 3 of these are TRUE)

A. The double declining balance method results in greater depreciation amount during the first year than the sum-of-years method.

TRUE. Yes, the double declining balance method is the most accelerated depreciation method of those that we studied in this course. See Question 1 above.

B. The future value of an asset does not depend upon the interest rate.

FALSE. The future value of an asset is HIGHLY dependent on the interest rate. $FV = PV(1+i)^n$

C. In the **IRR** function, it is important NOT to include any present values inside the **IRR** function; present values are added on outside the function.

FALSE. In the IRR function, you DO include the present value cash flows (see Question 4 above).

D. If the percentage of useful units produced is 10% each year for 10 years, the depreciation per year calculated using the Units of Production depreciation method is exactly the same as the yearly depreciation calculated using straight-line depreciation for the same useful life (10 years).

TRUE. Yes, if 10% of useful units are produced each year and the life is 10 years, then the depreciation is exactly 10%/year over its lifetime up to 10 years. This is exactly the same as straight-line depreciation.

E. Depreciation is important because it reduces the amount of taxes that a company must pay.

TRUE. Yes, depreciation costs reduce the amount of taxes that businesses must be paid!

Mark as completed

