

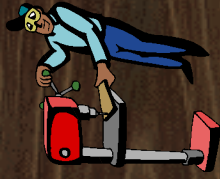


Annual Worth



AW involves converting all cash flows into an A value

The AW for *one life cycle* is the *same AW* for 2,3,4, or or an **infinite number of life cycles**, as long as all cash flows remain the same in succeeding life cycles (or change by only the inflation of deflation rate)

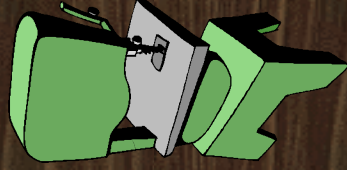


Life Cycle AW



An asset has a first cost of \$20,000, an annual operating cost of \$8000 and a \$5000 salvage value after 3 years. Calculate the AW for one and two life cycles at $i=10\%$

$$\begin{aligned} AW_{\text{one}} &= -20,000(A/P, 10\%, 3) - 8000 + 5000(A/F, 10\%, 3) \\ &= -\$14,532 \end{aligned}$$



$$\begin{aligned} AW_{\text{two}} &= -20,000(A/P, 10\%, 6) - 8000 - 15,000(P/F, 10\%, 3)(A/P, 10\%, 6) \\ &\quad + 5000(A/F, 10\%, 6) \\ &= -\$14,532 \end{aligned}$$

Thus, the AW for one life cycle is the *same* for all life cycles!!

Alt Comparison by AW

Not necessary to use LCM for different life alternatives

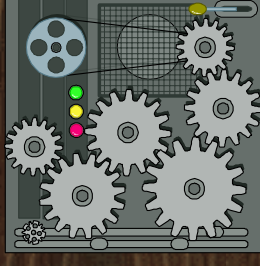
Example: A company is considering two machines for a certain operation. Machine X will cost \$30,000 with annual costs of \$18,000 and will have a \$7,000 salvage value after 4 years. Machine Y will cost \$50,000 with annual costs of \$16,000 and a \$9,000 salvage value after its 6 year life. Which machine should the company purchase if it uses an interest rate of 12% per year?

Solution:

$$\begin{aligned} AW_X &= -30,000(A/P, 12\%, 4) - 18,000 + 7,000(A/F, 12\%, 4) \\ &= -\$26,412 \end{aligned}$$

$$\begin{aligned} AW_Y &= -50,000(A/P, 12\%, 6) - 16,000 + 9,000(A/F, 12\%, 6) \\ &= -\$27,052 \end{aligned}$$

The company should purchase machine X





AW of infinite-life alts



Basic equation is $A = Pi$

Example: Compare the alternatives below using AW and $i=10\%$ per year

	<u>C</u>	<u>D</u>
First cost, \$	50,000	250,000
Annual cost, \$/yr	20,000	9,000
Salvage value, \$	5,000	75,000
Life, yrs	5	∞

Solution: $AW_C = -50,000(A/P, 10\%, 5) - 20,000 + 5,000(A/F, 10\%, 5)$
 $= -\$32,371$

$AW_D = -250,000(0.10) - 9,000$
 $= -\$34,000$

Select alternative C

