E355 Engineering Economics Spring 2022
Classroom Assignment #8

"I pledge my honor that I have abided by the Stevens Honor System"

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1) A company wants to purchase a machine that has the following probable cash flows. It is expected to have a useful life of 10 years and a MARR of 5%. Determine the expected value of the NPW of the machine. The first cost is $32,000 [3 points]

	p = 60%	p = 40%
Annual Costs	$2,000	$3,000
Salvage Value	$15,000	$10,000

$Annual\ Cost = (2000 \times 0.6) + (3000 \times 0.4) = \$2,400$
$Salvage\ Value = (15000 \times 0.6) + (10000 \times 0.4) = \$13,000$

$NPW = -P - A(\frac{P}{A}, i, N) + F(\frac{P}{F}, i, N) = -32000 - 2400(\frac{P}{A}, 5\%, 10) + 13000(\frac{P}{F}, 5\%, 10)$
$NPW = -32000 - 2400(7.722) + 13000(0.6139)$
$NPW = -\$42,552.10$

2) The following matrix represents the annual benefits of a potential project in thousands. [3 points]

Probability	A1	A2	A3	A4
20%	$4	$4	$4	$5
30%	$3	$2	$2	$4
10%	$2	$3	$3	$4
40%	$3	$3	$2	$4

a) Do any alternatives dominate any others and/or all others? And if so, which one(s)?

A4 dominates the other alternatives, as it offers the highest benefits for each probability section.

b) Calculate the range for each alternative? Which alternative has the best range? Why?

$A1 = 4 - 2 = 2$
$A2 = 4 - 2 = 2$
$A3 = 4 - 2 = 2$
$A4 = 5 - 4 = 1$←Lowest, most desirable

c) What is the most probable future worth? Why?

A4 is the most probable, as it has the highest benefit for each probability, and the lowest range of the Alternatives.