E355 Engineering Economics Spring 2022
Classroom Assignment #3

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

By: Alexander Gaskins, Daniel Goldberg, and Samuel Gavrilov

1. If a financial opportunity will pay $750 a year for 15 years and the investment for that opportunity is $6,500. What is the rate of return? [3 points]

PW of Benefits - PW of Costs = 0

AE(P/A, i, N) - 6500 = 0
750(P/A, i, 15) = 6500
(P/A, i, 15) = 8.67

At 7% table returns P/A = 9.108 for n=15
At 8% table returns P/A = 8.559 for n=15

Interpolate:

PW_1 = AE(P/A, i, 15) - 6500 for i = 7%
PW_1 = 750(9.108) - 6500 = **$331**
PW_2 = AE(P/A, i, 15) - 6500 for i = 8%
PW_2 = 750(8.559) - 6500 = **-$80.75**

IRR = 7% + $\frac{(0-331)(8\%-7\%)}{(-80.75-331)}$ = **7.804%**

2. Your company has the opportunity to invest in a project that will have an annual gross income of $8. million. The investment requires $25 million and would last 8 years. What is the IRR for this opportunity? [2 points]

PW of Benefits - PW of Costs = 0

AE(P/A, i, N) - 25 = 0
8(P/A, i, 8) = 25
(P/A, i, 8) = 3.125

At 25% table returns P/A = 3.329 for n=8
At 30% table returns P/A = 2.925 for n=8

Interpolate:

PW_1 = AE(P/A, i, 8) - 25 for i = 25%
PW_1 = 8(3.329) - 25 = **$1.63**
PW_2 = AE(P/A, i, 8) - 25 for i = 30%
PW_2 = 8(2.925) - 25 = **-$1.60**

IRR = 25% + $\frac{(0-1.63)(30\%-25\%)}{(-1.60-1.63)}$ = **27.52%**

3. If your company requires a 15% MARR, should your company proceed with the opportunity? Why? [1 points]

If IRR > MARR ➜ ACCEPT
If IRR = MARR ➜ INDIFFERENT
If IRR < MARR ➜ REJECT

IRR = 27.52%
MARR = 15%

Since 27.52% > 15%, the company should proceed with the opportunity.