37.2 A data center developer has a choice between (1) building a $50M data center that will have a 30 year lifespan and cost $1M per year to maintain, and (2) building a $15M data center that will have a 10 year lifespan and cost $3M per year to maintain. If the interest rate is 8%, which alternative is superior?

A. Option 1

B. Option 2

C. Neither, the options are comparable.

D. There is not enough information.

In engineering economics, when evaluating alternatives, there are two basic approaches: comparing the present value, and comparing the equivalent uniform annual cost (EUAC). When the two options have the same lice cycle, present value is a viable option. However, when the two options have different life cycles as is the case here, EUAC is the preferred approach. The maintenance costs are given as annual costs already, so the main task is annualizing the up front cost. Write expressions for the EUAC for both options. Use the $i = 8\%$ Factor Table to retreive the cash flow factors.

$$EUAC_1 = \$50M\,(A/P, 8\%, 30) + \$1M = \$50M\,(0.0888) + \$1M = \$5.44M$$

$$EUAC_2 = \$15M\,(A/P, 8\%, 10) + \$3M = \$15M\,(0.1490) + \$3M = \$5.23M$$

Option 2 is superior.
Answer B