Homework Assignment #1 Solutions
AEM 2240: Spring 2024 (Addoum)

1) Last National Bank offers a certificate of deposit (a.k.a. as a "CD") paying a return of 7%/year. If you invest $1,000 how much will you have at the end of year 5?

   PV: -1,000, PMT: 0, I/Y: 7, N: 5 → FV: 1,402.55

2) You want to buy a house in 4 years and expect to need $25,000 for the down payment. If you currently have $15,000 to invest, what annual rate of return do you need to reach your goal?

   FV: 25,000, PV: -15,000, N: 4, PMT: 0 → I/Y: 13.62

3) You want to buy a car, but you are $5,000 short (i.e., you need $5,000 more than you currently have). If you could invest your entire savings of $2,350 at an annual rate of return of 12%, how long would you have to wait until you have accumulated enough money to buy the car?

   FV: 7,350, PMT: 0, PV: -2,350, I/Y: 12 → N: 10.06 years

4) Your uncle puts $50,000 into a bank account earning 6%/year. You can't withdraw the money until the balance has doubled. How long will you have to leave the money in the account?

   PV: -50,000, FV: 100,000, I/Y: 6, PMT: 0 → N: 11.99 years

5) You want to buy a new OLED television in 3 years, when you think prices will have gone down to a more reasonable level. You anticipate that the television will cost you $2,500. If you can invest your money and earn a **monthly return** of 0.67%, how much do you need to set aside today?

   FV: 2,500, PMT: 0, I/Y: 0.67, N: 3*12
   → PV: -1,965.79

6) Which of the following statements are TRUE?

Statement I:	As you increase the rate of return, the future value of an investment increases.
Statement II:	As you increase the length of time to receive some lump sum, the present value of that lump sum increases.
Statement III:	The present value of an annuity increases as we increase the "discount rate."

   Statement I only

7) You are expecting twins and want to have $500,000 by the time your two kids go to college. You believe you can earn a return of 7%/year. You have nothing saved up. But you can contribute $8,000 each year going forward. How many years will it take you to grow your money to $500,000?

PV = $0, FV = $500,000
I/Y = 7, PMT = -$8,000
N = ? = 24.86 years

8) A young couple buys their first house. The couple has borrowed $400,000 from the bank. The terms of the mortgage are 30 years of monthly payments at an APR of 6% compounded monthly (→ monthly interest is 6%/12). The loan will be entirely paid off by year 30. What is the monthly payment for the couple?

N: 30*12, I/Y: 6/12, PV: 400,000, FV: 0 → PMT: -2,398.20

9) Herbilux Botanicals forecasts the following cash flows:

Year	Cash flow
1	$ 697,000
2	$ 631,000
3	$ 574,000
4	$ 898,000
5	$9,981,000

If the firm's discount rate is 9%/year, what is the present value of the project?

CF_1 = $697,000 → PV = $639,449.54
CF_2 = $631,000 → PV = $531,100.08
CF_3 = $574,000 → PV = $443,233.32
CF_4 = $898,000 → PV = $636,165.84
CF_5 = $9,981,000 → PV = $6,486,965.17

→ Summing it all up yields $8,736,914.