ECON 313 HW 2
Due Monday, Sep 27
Starred questions are optional

1) Imagine that the Mini-Dow Average (MDA) is calculated by adding up the closing prices of five stocks and dividing that sum by a divisor. The divisor used in the calculation of the MDA is currently 0.775. The closing prices for each of the five stocks in the MDA today and exactly 1 year ago, when the divisor was 0.815, are given in the following table:

Stock	Today	1 Year Ago
Ace Computers	63.97	62.58
Coburn Motor Company	38.51	33.15
National Soap & Cosmetics	88.03	94.72
Ronto Foods	67.21	71.01
Wings Aircraft	83.25	85.03

a. Calculate the percentage change in each stock. Based on this, is your sense that the market is bullish or bearish?

$$\text{Percentage change in stock} = \left(\frac{\text{Price}_{\text{Today}} - \text{Price}_{1 \text{ year ago}}}{\text{Price}_{1 \text{ year ago}}} \right) \times 100$$

Stock	Today	1 Year Ago	Percentage change
Ace Computers	63.97	62.58	2.221157
Coburn Motor Company	38.51	33.15	16.16893
National Soap & Cosmetics	88.03	94.72	-7.06292
Ronto Foods	67.21	71.01	-5.35136
Wings Aircraft	83.25	85.03	-2.09338

Since three of the five stocks declined, that would seem to indicate a bearish market.

b. Calculate the MDA today and that of a year ago and calculate the percentage of change in the MDA. Based on this does the market appear to be bullish or bearish?

$$\text{MDA} = \frac{\text{Closing price of stock 1} + \cdots + \text{Closing price of stock 5}}{\text{MDA divisor}}$$

$\text{MDA}_{\text{Today}} = 439.9613$

MDA_{Lasst}= 425.14
The value of the MDA today is higher than one year ago, this general upward trend indicates a bull (rising) market.

c. Compare your answers to parts **(a)** and **(b)** above. Did you reach the same conclusion about the direction of the overall market? What role did the divisor play in terms of the conclusion you reached in part **b**?

The conclusions do not agree. The reason is that the divisor fell to a greater extent than the stock prices did, so the index level increased on net. The divisor could fall for a number of reasons, for example if one or more companies conducted a stock split or a spinoff.

2) Imagine that you have placed a limit order to buy 100 shares of Sallisaw Tool at a price of $68.00, although the stock is currently selling for $70.41. In each of the following cases, determine if the order is executed or not.

a. The stock price drops to $69.18 per share two months before cancellation of the limit order.

If the stock price drops to $69.18 per share two months before cancellation of the limit order, the order will not be executed.

b. The stock gradually drops to $64.23 per share.

If the stock price drops to $64.23 per share order will be executed.

c. The minimum stock price achieved before cancellation of the limit order was $68.64. When the limit order was canceled, the stock was selling for $76.91 per share.

The order will not be executed.

3) You sell 200 shares of a stock short for $61 per share. You want to limit your loss on this transaction to no more than $1,300. What order should you place?

You should place a stop-loss order to buy 200 shares at $68.
1300/200= 6.5
61 + 6.5 = 67.5

4) Given a real rate of interest of 3.4%, an expected inflation premium of 4.8%, and risk premiums for investments A and B of 3.1% and 4.4% respectively, find the following:

a. The risk-free rate of return, r_f

$$\text{Risk-free rate} = \underset{\text{of return}}{\text{Real rate}} + \underset{\text{premium}}{\text{Expected inflation}}$$

R_f = 3.4 + 4.8 = 8.2

b. The required returns for investments A and B

$$\text{Required return on investment } j = \text{Risk-free rate} + \text{Risk premium for investment } j$$

For A: 8.2 + 3.1 = 11.3%

For B: 8.2 + 4.4 = 12.6%

5) You invest $11,157 in stock and receive $133, $142, $181, and $198 in dividends over the following 4 years. At the end of the 4 years, you sell the stock for $14,800.
What was the IRR on this investment? You can use excel or a financial calculator to find IRR, but you first need to explain it using math.

Help: **IRR for a stream of income**

Example: Mila purchased an investment for $1,000. It generated the following stream of cash flows. Her internal rate of return was?

End of year 1 $500
End of year 2 $400
End of year 3 $300

First, let's do it manually:
$1000 = \frac{500}{(1+r)^1} + \frac{400}{(1+r)^2} + \frac{300}{(1+r)^3}$. You need to solve this equation for r. It's complicated! So you can use excel or a calculator to so.

Question: What's the intuition behind this equation?
Answer: Pay attention to definition of IRR: The discount rate that equates an investment's cost to the present value of the benefits that it provides for the investor. Also, keep in mind the concept of the time value of money.

Using excel: You can make use of the IRR function to find IRR. You can see the official description of the command on Microsoft here. Also, you can find the answer to this question here. Please be noted, we enter the initial investment as a negative number as it is a cash outflow.

Using TI Plus CE: Follow these steps

Press [APPS] [1] to select the "Finance" application.
Scroll down to find irr. Press [ENTER] to select the "irr".
Enter the numbers as follows: irr(-1000, {500,400,300}). Press [ENTER].

IRR for a single cash slow:

Example: What is the yield (IRR) on an investment costing $1,000 today that you expect will be worth $1,400 at the end of a 5-year holding period?

Math: $1000 = \frac{1400}{(1+r)^5}$, Solve this equation for r.

Excel: Here is the command you need: =RATE(5,0,-1000,1400). Here, you can find the official description on Microsoft.

TI Plus CE:

Press [APPS] [1] to select the "Finance" application.
Press [ENTER] to select the "TVM Solver...".
Press [5] [ENTER] to store 5 to N.
Press [0] [ENTER] since this example is solving for I.
Press [-] [1] [0] [0] [0] [ENTER] to store the present value.
Press [0] to store zero to PMT.
Press [1] [4] [0] [0] [ENTER] to store 1400 to FV.
Press [1] [ENTER] to make sure both the P/Y and C/Y are equal to 1.

$$11157 = \frac{133}{(1+r)^1} + \frac{142}{(1+r)^2} + \frac{181}{(1+r)^3} + \frac{198+14800}{(1+r)^4}$$ Therefore, r= 9%

Textbook questions

***Q3.7** Describe how, if at all, a conservative and an aggressive investor might use each of the following types of orders as part of their investment programs. Contrast these two types of investors in view of these preferences. a. Market b. Limit c. Stop-loss

a. *Market* orders are used when investors want to buy or sell a security quickly and are willing to trade at the current market price. Aggressive investors who buy and sell frequently to capture short-term price movements might use market orders to get in and out of positions quickly.
b. *Limit* orders are used when investors want to buy or sell a security and want to trade at a specified price. Cautious investors will use limit orders to protect themselves from large and rapid price fluctuations. Aggressive investors may use limit orders to automate trades once certain profit goals have met.

c. *Stop-loss* orders are used when investors want to protect themselves from significant losses. After buying a security, they enter these orders at a price below their purchase price to limit the amount of their potential loss. Stop loss orders are mostly used by cautious investors to protect themselves against large downward price fluctuations and to protect profits.

***P3.4** When a company conducts a stock split, it exchanges new shares for old ones according to some ratio. For example, in March 2018, Herbalife conducted a two-for-one stock split, so after the split each shareholder received two new shares in exchange for each share owned before the split. A stock split increases the number of shares outstanding but changes nothing else about the value of the company, so a split results in a proportionate decline in the per share stock price. In Herbalife's case, the price before the two-for-one split was $111.17, and the day after the split the price was $55, roughly (though not exactly) a 50% drop.

a. Suppose a company that is part of the DJIA engages in a two-for-one stock split and immediately after the split its stock falls by 50%, leaving the total value of the company unchanged. Conceptually, what impact should this split have on the DJIA?
b. When this split occurs, all else held constant, what happens to the numerator of Equation 3.1 (you can find the equation in PowerPoint slides)?
c. When this split occurs, all else held constant, what do you think happens to the denominator of Equation 3.1?
d. How would your answers to all three questions above change if a company in the S&P 500 conducted a two-for-one stock split?

a. If a stock splits and its value falls proportionately, one would expect the average to fall. The change would not be meaningful in terms of market movement, so the divisor is adjusted to compensate. However, the stock that split will now have less influence on the average than it had before the split.
b. When a stock splits, the numerator of equation 3.1 will go down.
c. After a split, the denominator must also be adjusted downward to hold the index equal to its pre-split value.
d. An S&P 500 type index is based on total company capitalization. Because stock splits theoretically do not change a company's capitalization, they should have no effect on an index of this type.

***P3.11** You have $5,000 in a 50% margin account. You have been following a stock that you think you want to buy. The stock is priced at $52. You decide that if the stock falls to $50, you would like to buy it. You place a limit order to buy 300 shares at $50. The stock falls to $50. What happens?

If you have a 50% margin account with $5,000 available, you will be able to buy $10,000 worth of stock. 300 shares at $50 per share would cost $15,000 so you will either have to reduce your order to 200 shares or add $2,500 to your account.

***P4.3** Assume you purchased a share of stock in Verizon communications at the beginning of 2017 for $54.58. A year later the stock was worth $53.53, but during 2017 it paid a dividend of $2.32. Calculate the following.

Income

Capital gain (or loss)

Total return a. In dollars b. As a percentage of the initial investment.

Income: = $ 2.32

Capital loss: $53.53 – $54.58 = $(0.85)

Total return:

(1) In dollars: $2.32 – $0.85 = $1.47

(2) As a percentage of the initial investment: $\frac{\$1.47}{\$54.58} = 0.0269$ or 2.69%

***P4.5** For each of the investments shown in the following table, calculate the rate of return earned over the period.

Investment	Cash Flow During Period	Beginning-of-Period Value	End-of-Period Value
A	−$ 800	$ 1,100	$ 100
B	$15,000	$120,000	$118,000
C	$ 7,000	$ 45,000	$ 48,000
D	$ 80	$ 600	$ 500
E	$ 1,500	$ 12,500	$ 12,400

Investment	Cash Flow During Period	Beginning - of- Period Value	End-of-Period Value	Period Rate of Return
A	$ (800)	$ 1,100	$ 100	-163.64%

B	$ 15,000	$ 120,000	$ 118,000	10.83%
C	$ 7,000	$ 45,000	$ 48,000	22.22%
D	$ 80	$ 600	$ 500	-3.33%
E	$ 1,500	$ 12,500	$ 12,400	11.20%

P4.10 Calculate a one-year holding period return for the following two investment alternatives. Which investment would you prefer, assuming they are of equal risk? Explain.

	Investment	
	X	Y
Cash received		
1st quarter	$ 1.20	$ 2.00
2nd quarter	$ 0.20	$ 2.00
3rd quarter	$ 0.40	$ 2.00
4th quarter	$ 3.80	$ 2.00
Investment value		
Beginning of year	$30.00	$56.00
End of year	$35.00	$56.00

	X	Y
Cash received		
1st quarter	$1.20	$2.00
2nd quarter	$0.20	$2.00
3rd quarter	$0.40	$2.00
4th quarter	$3.80	$2.00
Investment val.		
Beginning of year	$30.00	$56.00
End of year	$35.00	$56.00
Capital gain	$5.00	$0.00
HPR in $s	$10.60	$8.00
HPR percentage	35.33%	14.29%

***P4.15** A local entrepreneur asks you to invest $10,000 in a business venture. Based on your estimates, you would receive nothing for three years, at the end of year four you would receive

$4,900, and at the end of year five you would receive $14,500. If your estimates are correct, what would be the IRR on this investment?

	A	B
1	Year	Cash Flow
2	0	$ (10,000)
3	1	0 -
4	2	0 -
5	3	0 -
6	4	4,900
7	5	14,500
8	IRR	15.03%

P4.19 Justin Lieberman must earn a minimum rate of return of 9.25% as compensation for the risk of the following investment.

Initial Investment	$7,000
End of Year	**Income**
1	$1,000
2	$2,000
3	$3,000
4	$2,000
5	$1,000

a. Use present value techniques to estimate the IRR on this investment.
b. On the basis of your finding in part a, should Justin make the proposed investment? Explain.

a.

Year	Cash Flow
0	$ (7,000)

1	$ 1,000
2	$ 2,000
3	$ 3,000
4	$ 2,000
5	$ 1,000
IRR	8.91%

b. If Justin requires a 9.25% ROR, he should not accept this investment.

P4.20 Assume that an investment generates the following income stream and can be purchased at the beginning of 2020 for $2,000 and sold at the end of 2026 for $2,200. Estimate the IRR for this investment. If a minimum return of 5% is required, would you recommend this investment? Explain.

End of Year	Income Stream
2020	$140
2021	$120
2022	$100
2023	$ 80
2024	$ 60
2025	$ 40
2026	$ 20

End of Year	Income Stream
	$ (2,000)

2020	140
2021	120
2022	100
2023	80
2024	60
2025	40
2026	2,220
IRR	5.42%
NPV @ 9%	$48.95

If the ROR is 5%, the investment should be accepted.

P2.22 The Minnesota-based industrial conglomerate 3M has been paying dividends and increasing them for a long time. In 1970 3M shareholders received dividends per share of $1.10, and 47 years later in 2017 they received $5.07. What is the compound annual dividend growth rate over this period?

2017 – 1970 = 47 years

Using a financial calculator,
N = 47, PV = –1.10, PMT = 0,
FV = 5.07, **i = 3.30% ans**
Excel = rate(47,0, –1.10,5.07)