Example 3.1. You deposit $105 into a bank that pays 7% interest per year. How much will you have after 1 year?

Example 3.2. You deposit $100 into a bank that pays 5% interest per year. How much will you have after 1 year?
Example 3.3. You deposit $100 into a bank that pays 5% interest the first year, and 7% interest the second year. How much will you have after 2 years?

Example 3.4. You deposit $100 into a bank that pays 5% interest the first year, and 7% interest the second year. How much have you earned in interest over the two years?
Example 3.4. (continued) If you withdraw $5 after the first year, and then withdraw your balance after the second year, how much will you have earned in interest over the two years?
Example 3.5. You purchase a security for $100 that earns 5% the first year, 7% the second year, and loses 4% the third year. What is the value of your investment after 3 years?

Example 3.6. You deposit $200 into a bank that pays 7% interest per year. How much will you have after 4 years if you don’t withdraw any?
Example 3.7 You deposit $250 into a bank that pays 7% per year. At the end of 3 years, you withdraw $100, and leave the rest in the bank. How much will you have in your account after 8 years?
Example 3.8. A savings bond will pay you $200 on your 27th birthday, which is 4 years away. Assuming a discount rate of 7%, what is the present value of this payment?
Example 3.9. Tuition and fees for a semester was about $1800 five years ago, and now is about $3100. What is the annual rate of increase?
Example 3.10. According the the April 3, 1998 Wall Street Journal, musician George Kress sold his Stradivarius violin for $1.58 Million. He had purchased said violin in 1958 for $24,000. What rate of return did he earn on this violin.
Example 3.11. A popular stock market index had a value of 25.3 in 1958, and 2347 in 1998. If George had simply put his $24000 into this index, what would his investment be worth today? What rate of return would he have earned? Would this have been better than buying the Stradivarius violin?
Example 3.12. UTSA tuition has been increasing at about 10% each year. How long will it take for tuition to double? (Will you graduate before it doubles?)
Example 3.13. What is the present value (using a 5% discount rate) of the following CF's?

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF</td>
<td>100</td>
<td>50</td>
<td>0</td>
<td>325</td>
</tr>
</tbody>
</table>

What is the PV using a 10% rate?
Example 3.14. What is the future value (using a 5% discount rate) of the following CF’s?

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF</td>
<td>100</td>
<td>250</td>
<td>550</td>
<td>325</td>
</tr>
</tbody>
</table>

What is the FV using a 10% rate?
Example 3.15. KindaCheep Life Insurance Co. is offering you an investment policy that will pay you and your heirs $10 per year forever. If your required return on this investment is 5%, how much will you pay for the policy?
Example 3.16. EvenCheeper Life Insurance Co. is offering you an investment policy that will pay you and your heirs $10 per year forever, with your first payment 4 years from today. If your required return on this investment is 5%, how much will you pay for the policy?
Example 3.17. Diagram to derive annuity formula
Example 3.19. If you invest one dollar at 5% per year, how much interest will you have earned after:

A) 2 years

B) 2 months
Example 3.20. Interest Earned After 1 Year: Invest $1:

If you earn 0.11 interest after 3 years, how much did you earn after 1 year?
Example 3.21. Interest Earned After 1 Year: Invest $1:

If you earn 0.03 interest after 2 months, how much would you earn in 1 year
Example 3.22. Which car loan? You have $2500 to put down on a new car that you have bargained to $24962 including Tax, Title, License, and all fees. Two financing options are:

- 36 months at 6.9%
- 72 months at 7.7%

What is your monthly loan payment for each option?
How much do you pay into interest for each option?
Example 3.23. You require a loan of $20,000 on your car purchase and can either have a 1.8% finance rate for 48 months or $1000 cash back. If you choose the cash back, it will cost you 5.7% for 48 months? Which is the best alternative? Why?
Example 3.24. Kristy Turney got rid of her plastic hubcaps just 4 days after buying her “new used car.” She received a new set of 1800 wheels by agreeing to pay $57 per week for 52 weeks. How much interest will Ms Turney pay? What is the APR and the EAR for this “loan”? 
Example 3.26. Your friendly loan shark makes you a “2 for 4 or I knock at your door”, which means he will loan you $200 today, but you must pay him back $400 in one month, or else you get the knock at your door. What is the APR and EAR of this financial transaction?
Example 3.27. You have $100 to invest and the following options are available. Invest at 5% per year for three years, or invest at 6% for two years. For you to have an equal amount in your account after three years, at what rate would you have to invest in the third year, if you chose the two year investment?
Example 3.28.
What is the present value of receiving $100 every 3 months if the discount rate is 12% compounded monthly?
Example 3.29. Skipping perpetuity.
What is the present value of receiving $100 one year from now, $200, two years from now, $100 three years from now, $200 four years from now, and so on, in perpetuity if the stated rate is 5% compounded annually?
Example 3.30. (Example 3.13, revised).
What is the present value (using a 5%, compounded quarterly discount rate) of the following CF’s?

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF</td>
<td>100</td>
<td>50</td>
<td>0</td>
<td>325</td>
</tr>
</tbody>
</table>
Example 3.31 – A growing perpetuity. Even Better Assurance Company offers you a perpetuity whose payment will grow a 3% every year. The first payment of $1500 will be one year from now. For a 9% discount rate, what is the present value of this growing perpetuity?
Example 4.1. A 6% semi annual coupon bond has 10 years until maturity. The market (discount) rate is 5%. What is its price?

What would be the price of a similar annual coupon bond?
Example 4.2. Consider a 7% semiannual coupon bond with 28 years until maturity. The market rate = 8%. What is the price of the bond?
Example 4.3. Consider 2 Bonds
A: 7% Bond with 28 years to maturity
B: 7% Bond with 4 years to maturity
Compute the market price of these bonds as the market rate changes from 3-10%
Example 4.4. The Wachovia Capital trust bond with a 5.800 coupon which matures Mar 15, 2011 has a price quote of 97.748. What is its YTM?

Example 4.5. You purchased a 5% semi annual coupon bond, with 10 years until maturity, one year ago when the market rate was 7%. The market rate is now 6%. What price did you pay for your bond, and what could you sell it for today?
Example 4.6. If Treasury bills are currently paying 5 percent and the inflation rate is 3.4 percent, what is the approximate real rate of interest? The exact real rate?
Example 4.7. Zero coupon Treasury strips with 3 years until maturity have a yield of 5%, while similar 2-year strips yield 6%. According to the expectations theory, what yield will one year strips have two years from now?
Example 5.2. You expect that JK Corp stock will sell for $25 one year from today. You expect to receive $1.20 in dividends over the year you hold this stock. For a 15% required rate of return for this stock, how much should you pay for it? What is your projected capital gain?

Example 5.3. You expect to sell MyCo for $28 two years from today. You expect to receive $1 dividend the first year, and a $1.10 dividend the second year. For a 16% discount rate, what is the maximum you should pay for this stock?
Example 5.4. What should you be willing to pay for a stock which pays a $2 dividend the first year, a $2.10 dividend the second year, and $2.21 in the third year if you will sell the stock for $40 after three years? Discount rate is 13%
Example 5.5. Sombria industries recently paid a $2 dividend, and its dividends have been growing at 5% per year. The appropriate discount rate for this stock is 12%.

What should its current price be?

What do you projects its price to be 5 years from now?
Example 5.6. Ootsa Corp. is trading for $50 per share. Next year you expect it to pay a $2 dividend, and dividends have been growing at a 6% rate. What rate of return do investors require from this stock? What is the dividend yield? What is the capital gain yield?
Example 5.7. Joogle is a high tech start-up that is not expected to pay a dividend for 10 years. At that time you expect it will pay an $8 dividend, with a growth rate of 7%. For a 12% required return, what should you be willing to pay for Joogle today? What will its stock price be 5 years from today?
Example 5.8. Morris Industries most recent dividend was $3 per share. These dividends are projected to increase at 8% per year for the next 3 years, and then by 5% thereafter. The firm’s required return is 12%. What should its stock sell for?
Example 6.1. You purchased a stock last year for $25. It has paid $1 in dividends and is now worth $21. What is your Dollar Return?

Example 6.2. You bought an 11% coupon bond one year ago for $1125. You can sell that bond today for $1100. What is your Dollar Return?
Example 6.1 (Revised). You purchased a stock last year for $25. It has paid $1 in dividends and is now worth $21. What is your Dollar Return?
  • What is your hpr?

Example 6.2 (Revised). You bought an 11% coupon bond one year ago for $1125. You can sell that bond today for $1100. What is your Dollar Return?
  • What is your hpr?
Example 6.3  You purchased a 5% semi annual coupon bond, with 10 years until maturity, one year ago when the market rate was 7%. The market rate is now 6%. What rate of return (hpr) did you make on your investment?
Example 6.4. You invested in a mutual fund with the following returns by year.

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return</td>
<td>15.71%</td>
<td>2.37%</td>
<td>-19.45%</td>
<td>8.72%</td>
</tr>
</tbody>
</table>

What is the arithmetic mean return you enjoyed?
What is the standard deviation of these returns?
What is the geometric mean return you enjoyed?
What is your ending balance if you deposited $1000 at the beginning of each year into this account? What IRR did you earn from this investment?
Example 7.1. What are the portfolio weights for a portfolio that has 80 shares of Stock A that sell for $42 per share and 40 shares of Stock B that sell for $68 per share?
Example 7.2. You own a portfolio that has $500 invested in Stock A and $1,600 invested in Stock B. If the expected returns on these stocks are 12 percent and 18 percent, respectively, what is the expected return on the portfolio?
Example 7.3. You own a portfolio with $2500 invested in Stock X, $1500 invested in Stock Y, and $1000 in Stock Z. The Beta of these three stocks are 1.8, 1.4, and 0.6, respectively. What is the portfolio beta?
Example 7.4. You have $20000 to invest in a portfolio of Stock A and Stock G. You would like to earn a 14% rate of return. How much money will you invest in each stock? What will the Beta of your portfolio be?

<table>
<thead>
<tr>
<th>Stock</th>
<th>$E(R_i)$</th>
<th>$\beta_i$</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>18%</td>
<td>1.5</td>
</tr>
<tr>
<td>G</td>
<td>12%</td>
<td>0.9</td>
</tr>
</tbody>
</table>
Example 7.5. You have $20000 to invest in a portfolio of Stock A and Stock G. You feel that a Beta=1.2 would suit your risk tolerance. How much money will you invest in each stock? What return can you expect on this portfolio?

<table>
<thead>
<tr>
<th>Stock</th>
<th>$E(R_i)$</th>
<th>$\beta_i$</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
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<td>1.5</td>
</tr>
<tr>
<td>G</td>
<td>12%</td>
<td>0.9</td>
</tr>
</tbody>
</table>
Example 9.1. You purchased a new lawnmower for your Landscape business for $5000 that you expected to use for 3 years, and then sell for $500. After 2 years you saw a great deal on another mower so you decided to replace your mower, and sold your old mower for $1500. What is your ATCF from selling your old mower (tax rate = 30%)?
Example 9.2. Noble’s Best Doughnuts is considering buying a dough machine for $150,000 that it will depreciate (straight line) over its expected 3 year life. It expects to sell the machine for $30,000 at that time. Doughnut sales are projected to increase $100,000 per year. Operating costs are 30% of sales. Noble pays a 34% tax on its income. What are the incremental OCF’s Noble can expect from this project over the next 3 years?
Example 9.3. Same as 9.2, but use MACRS for computing the depreciation, i.e. what are the OCF’s?

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowance</td>
<td>33.33%</td>
<td>44.44</td>
<td>14.82</td>
<td>7.41</td>
</tr>
</tbody>
</table>
Example 9.4. Noble’s Best Doughnuts will need additional supplies of doughnut mix and sprinkles to feed this machine. It estimates it will need to keep an additional $10,000 of baking supplies on hand during the life of the project. What are the ATCF’s associated with the change in NWC to support this project?
Example 9.5. As noted earlier, Noble’s Best Doughnuts will invest $150,000 on the new doughnut machinery, and expects to sell the used machinery after 3 years for $30,000.

1. What is the ATCF from Salvage using straight line depreciation?
2. What is the ATCF from Salvage using MACRS?
3. What are the ATCF’s from investment?
Example 9.6. What will Noble’s pro forma look like for:

1. Straight Line depreciation
2. MACRS depreciation

For each case above, what is the IRR of the project?

For Straight Line Depreciation

<table>
<thead>
<tr>
<th></th>
<th>Time 0</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NWC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total ATCF</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

IRR =

For MACRS Depreciation

<table>
<thead>
<tr>
<th></th>
<th>Time 0</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCF</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>NWC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total ATCF</td>
<td></td>
<td></td>
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</tbody>
</table>

IRR =
Example 10.1  Noble’s Best Doughnuts has a beta of 0.7. Treasury bills are yielding 3% and the market risk premium is 7%. It has 1,000,000 shares outstanding that are trading at $35 per share. It also has issued 25,000 shares of preferred that have an annual dividend of $8.00, and are trading for $125. It also has 20,000 outstanding bonds trading at 120% of par (7% coupon with 15 years until maturity). What is the WACC for Noble given its 30% tax rate?

First compute \( r_E \)  (Hint: use CAPM)
Noble’s Best Doughnuts has a beta of 0.7. Treasury bills are yielding 3% and the market risk premium is 7%.

Compute \( r_F \)  (Hint: it’s the market return on the preferred
It also has issued 25,000 shares of preferred that have an annual dividend of $8.00, and are trading for $125.
Example 10.1 continued. Compute $r_D$ (Hint: it’s the YTM of the existing bonds adjusted for taxes)
It has 20,000 outstanding bonds trading at 120% of par (7% coupon with 15 years until maturity). given its 30% tax rate?
Ex 10.1 (con’t). Compute the market value of Noble, and use to compute the capital share weights used to compute WACC.

It has 1,000,000 shares outstanding that are trading at $35 per share. It has 20,000 outstanding bonds trading at 120% of par. It also has issued 25,000 shares of preferred that are trading for $125.

Value of equity

Value of preferred

Value of debt

Value of company

Weight in Equity

Weight in Preferred

Weight in Debt

The WACC of Noble