ADMS 3541 Fall 2015
Assignment 2
Solutions

Due Dates
Section A: Wednesday, November 25th
Section B: Thursday, November 26th

Instructions:

Each group must submit the assignment to the instructor at the beginning of class on the date the assignment is due. When completing your assignment, please observe the following rules and guidelines:

1. Textual portions must be typed and double-spaced. This does not include variables, labels and brief notes of explanation. Use at least one inch margins all around.
2. Double-sided is preferred, if you can do it with your printer.
3. Use 8 ½ X 11 paper only.
4. Do not use report covers.
5. Staple your assignment prior to handing it in.
6. Be sure to write clearly your names, student numbers, section, and due date on the cover page.
7. Spelling and grammar will affect your marks.
8. Late assignments will lose 5 points for each day they are late.
9. No assignments will be accepted after the last class.

Problem #1: Multiple Concepts (9 marks)

(a) Monique has been using her local bank since she opened her first account in high school. She has all of her accounts with this bank, including:

Chequing account	$3,500
Joint savings account with husband	112,000
Joint savings account with mother	60,000
Savings account	11,000
Term Deposits	90,000
RRSP (invested in the bank's GIC's)	190,000
TFSA (in the bank's stock mutual fund)	25,000

She's read about the banking crisis in the U.S. after the housing crash and is worried the same thing could happen in Canada. She wants to know if her money is protected and if she needs to do anything to insure she doesn't lose money in such an event.

To what extent will her investments be covered by the CDIC? If she is not fully covered, then what should she do (be specific)? (3 marks)

Total amount of accounts/deposits in her name = 3,500+11,000+90,000=104,500. She will lose $4,500 because the CDIC coverage is up to $100,000.

Her RRSP is separately covered up to $100,000, so she will lose $90,000.

Her TFSA will not be covered by the CDIC because it is invested in stocks.
Joint savings account with husband will be covered up to $100,000. They will lose $12,000.
Joint savings account with daughter will be covered up to $600,000; so it fully covered.

She should open an account in another bank and transfer some money there. More specifically, she should move her savings account ($11,000) and then when her term deposits mature, she should move that money over as well. She should also separate her RRSP account across banks. But really that money should be invested. There isn't much to do with her TFSA since she has investments. She should also split the savings account with her husband, putting maybe half in the new bank.

(b) Jacob and Michele bought a house 19 years ago for $110,000, and at the time also bought a home insurance policy to provide coverage for $90,000 of replacement value. There is an inflation protection provision in the policy so that the amount of insurance coverage automatically increases every year at the rate of inflation (estimated to be 2% each year). The current replacement value of the house is 319,000. The deductible is $500. Recently, a tree fell on their house virtually destroying part of it. The total damage came to 98,000. How much will the insurance company pay them? (3 marks)

The current coverage = $90,000$(1.020)^{19}$ = $131,113

80% of replacement value = .8($319,000) = $255,200.

The 80% rule is not satisfied. They are only covered for (131,113/255,200) 51.38% of the damage.

They will get ($98,000*.5138) - $500 deductible = $49,849

(c) Marco wants to borrow $420 for 20 days from Friendly Freddie Payday Loans. Freddie charges a flat rate of $40 per loan, plus 8% on the principal, plus EAR of 50% on the first $300 borrowed and EAR of 59% on the next $500. Calculate (i) the cost of the loan for Fred, and (ii) the EAR of the loan. (3 marks)

Cost of the loan = $40 +$420(.08) +300[$1.5^{20/365}$ – 1] + 120[($1.59^{20/365}$ -1] = $83.43

EAR = $[1 + 83.43/420]^{365/20}$ – 1 = 26.2954, which is 2629.54%

Problem #2: Rent vs. Buy (20 marks)

Charles and Bidu are looking to buy a condo. The live in Pickering, ON where they are currently renting a two-bedroom apartment for $1400 per month. The apartment is rent-controlled and rent will increase 3% each year. The condo they would like to buy is $210,000. They don't plan to stay in Pickering long, but because of the hot real estate market, they think it might be a good investment.

- The mortgage they can get is a variable rate 2.30% (five year term, 25 year amortization and expected to stay constant over the term), the condo fees are $212/month and property taxes are $2950/year. Maintenance costs are expected to increase 10% each year and property taxes will increase with inflation (2%).
- They have $42,000 as a down payment and expect other fees at closing to total $2,900.
- Some assumptions:
  - They expect the house to increase in value by about 10% each year.
  - They think they will live in the condo for 3 years.
  - Assume a 2% discount rate

(a) Assuming the sell the condo at the end of year 3, do you recommend they buy or rent?

** Use your best judgement with the marks. I tried to give you a key below, but you might find that doesn't fit the problem all that well. Feel free to make adjustments.

Given the information in the problem, it is much more lucrative for them to buy (1 mark for identifying the decision).

Annual Cost	**1**	**2**	**3**
Mortgage Payment (2 marks)	8,822.40	8,822.40	8,822.40
Property Taxes (1 mark)	2,950.00	3,009.00	3,069.18
Maintenance (1 mark)	2,544.00	2,798.40	3,078.24
Closing Costs (1 mark)	2,900.00		

Gross Home Ownership Costs (1 mark)	17,216.40	14,629.80	14,969.82
Rent (1 mark)	16,800.00	17,304.00	17,823.12
Net Home Ownership Costs (3 marks for the current treatment of these into net rent/ownership costs)	(416.40)	2,674.20	2,853.30
Home Purchase			
Net savings invested @ 2%	0.00	2,674.20	5,580.98
Original down payment, plus year 1 savings invested (1 mark)	43,256.40	44,121.53	45,003.96

Home Purchase (4 marks)	
Savings at end of Year 3	5,580.98
Equity in Home	102,309.50
Total (Buy Home)	107,890.48
Total Return on Investment	*157%*

Rent (1 mark)	
Savings at end of Year 3	45,003.96
Total (Rent)	42,000
Total Return on Investment	*7.15%*

FV of Home	Year 1	Year 2	Year 3
PV	210000		
N	1	2	3
I/Y	10%		
FV	231000	242550	**254677.5**
Outstanding mortgage after 3 yrs			
PMT	735.2		
I/Y	0.1908		
N	288	276	264
PV	162,785	157,636	152,368
Home Equity	**$ 68,215.00**	**$ 84,914.00**	**$ 102,309.50**

Aside from the calculations, what else should they consider? (1 mark for each reasonable consideration)

House prices are not guaranteed to increase at 10% and may even decrease.

Other (unexpected) expenses could make home ownership less lucrative.

We did not factor in expenses for moving or realtor fees, which can both decrease the return on home ownership.

Other answers might be acceptable. Use best judgment.

Problem 3: Housing Market (6 marks)

Read the following articles and provide some advice for homeowners and non-homeowners in Canada. Should people be worried? You must cite at least 2 additional sources in support of your assessment.

http://www.cbc.ca/news/business/canada-s-housing-market-faces-a-looming-demographic-bubble-1.3310637

http://www.cbc.ca/news/business/ccpa-housing-correction-1.3310401

This is a subjective question that will require students to reflect on the status of home ownership in Canada. Students may cite a number of sources including news articles, government reports, and industry reports. There are many things for Canadians to consider such as the record low interest rates. What happens when they go up, which they are bound to do? Are foreign investors a blessing or a curse?

I expect you to get a wide variety of assessments. Three marks should be allocated for quality (meaning grammar, train of thought, clear presentation of ideas, etc.) and three for the argument – did they back it up with additional research? Does the argument make sense? Did they provide 2 citations? Format of citations does not matter, only that they are included.

Problem 4: Life Insurance (15 marks)

Judy (age 43) and Jim Leone (age 42) are reviewing their life insurance coverage. Judy works as director for a large non-profit, earning a $200,000 gross salary. Jim is the communications director for a large Canadian bank and earns $150,000 gross. Their daughters, Madison and Caitlin, are 10 and 7, respectively. Judy and Jim plan to retire in 25 years. Given their ages and high salaries they will qualify for the maximum CPP benefits.

They have assembled the following information:

	Judy	Jim
Gross annual salary	$200,000	$150,000

After tax income	$135,000	$100,000
Employer paid life insurance	2X salary	3X salary
Pension if die now	no pension	$200,000 lump sum to Judy if he dies now
Future Raises	Judy does not expect a raise that is greater than inflation, but in 6 years she is expected to be promoted to CEO of the non-profit and will receive a $50,000 raise	Jim expects to receive a 5% raise each year and in 10 years plans to receive a promotion that comes with a 25% pay increase.

All the values are in real dollars. The real rate of interest is 2%.

Required

(a) Estimate their life insurance needs using the income method. (13 marks)
(b) Go online to get a price quote for each of them. Note your source. (2 marks)

There were a wide range of interpretations of this problem and the marker was lenient with the marks on this one.

Part (a), life insurance using the income method. Assume kids qualify for CPP survivor benefit to age 21. To simplify the problems I make an assumption that inflation is 2%. Students have some leeway on this assumption and resulting calculation.

CPP Survivor benefit information can be found here: http://www.servicecanada.gc.ca/eng/services/pensions/cpp/payments/index.shtml

First we have to calculate the PV of each of their salaries:

For Judy ***They should use 200,000 as the salary unless they find Jim's marginal rate and adjust her after salary with his marginal rate and then make the 75% adjustment.*

PMT = 200,000
N = 6
I = 2
CPT PV = 1,120,286

PMT = 250,000
N = 19
I = 2
CPT PV = 3,919,615 (Answer accepted if brought back to today)

Total in Salary for Judy: 1,120,286 + 3,919,615 = 5,039,901 (2 marks)

Subtract PV of CPP Survivor benefits (1 mark)
PMT = 6974
N = 25

I = 2
CPT PV = 136,157

5,039,901 - 136,157 = 4,903,744

Subtract Employer insurance, CPP death benefit, and children CPP survivor benefits (2 marks)

4,903,744 – 400,000 – 2500 - 27,584 - 34,121= 4,439,539

Adjust for tax 4,439,539 *.75 = 3,329,654 (1 mark)

She needs approximately 3 – 3.5 MM.

For Jim

Note for this, students may have interpreted this a number of ways because inflation wasn't explicitly mentioned. As long as they made reasonable assumptions, you can be lenient with the marking.

$PVCGA_{n=10,k=2\%,g=5\%}$ = 1,681,305 (2 marks) ***They may have assume this was a straight annuity with 5% growth and not included inflation. That is an acceptable approach.*
Salary at year 10: (1 mark)
PV = 150000
N = 10
I = 5
CPT FV = 244,334

Present value of new salary at Year 10 ***Students may have done another PVCGA here because it wasn't explicitly stated whether or not the 5% raise was still relevant. Accept either answer.*
PMT = 244,334
N = 15
I= 2 (they might choose 5)
PV = 3,139,514

PV back to year 0
FV = 3,139,514
I = 2
N = 10
PV = 2,575,495

Total income needed 1,681,305 + 2,575,495 = 4,256,800 (3 marks)

Subtract employer pension, employer insurance, CPP death benefit, PV CPP, and children survivor benefits
4,256,800 – 200,000 – 450,000 – 2500 -136,157 - 27,584 - 34,121= 3,437,148 (2 marks)

Adjust for tax 3,437,148 *.75 = 2,577,861 (1 mark)

He needs approximately 2.5MM.

	Judy	Jim
Salary	200,000	150,000
CPP survivor benefit 581.13 X 12 PV, 25yr, 2%	136,157	136,157
- Employer insurance	400,000	450,000
- CPP death benefit	2,500	2,500
- Employer pension		200,000
- Madison PVA 234.87 x 12, 11 yr	27,584	27,584
- Caitlin PVA 234.87 x 12m 14 yr	34,121	34,121
Basic Benchmark 75%	75%	75%

Part (b) From Kanetix.ca, I found the following policies using a Toronto postal code: (2 marks)

A 2 MM policy for Judy (assuming she doesn't smoke) was approximately $2,200/year for a 20-year policy. If she wants a 3 M policy, it will cost her approximately $909 for each million, so just over $3,000 year.

A 20-year 2 MM policy for Jim (assuming he doesn't smoke) was approximately $3,000/year. Therefore, another $500k, would likely cost him $333/year for a total for $3,333/year

In both cases, it's ok if students just give a quote for 2 million (as long as they state the issue of most places only providing quotes up to $2M) or get quotes from two places. They can also argue that they only need 10 years since the youngest child is 7.

Problem #5: Car Accident (10 marks)

Millie and Andre were recently in a car accident. Andre was texting and driving when he rear ended another car. The driver of the other car was insured and his car needed $5,400 in repairs. Andre's car needed repairs totalling $7,800. While his car was being repaired he needed to rent a car. Rental charges were $380 for the period. Millie sustained a neck injury and was unable to work for 6 months following the accident, causing her lost wages of $68,000. Andre's insurance company only paid her the maximum payout ($400/week) so she was forced to sue Andre for the rest. Andre's deductible is $1,000.

(a) Assuming the lawsuit is successful, how much will Andre have to pay, in total, for the accident? (7 marks) Note, you will need to go online and do some research to answer this question.

(1 mark for identifying the correct coverage)
Ontario minimum insurance:

- Third party liability coverage: $200,000
- Medical:
  - Up to $3,500 for minor injury
  - Up to $50,000/person for medical and rehabilitation benefits
  - $36,000 for attendant care benefits
  - $1M for catastrophic injuries
- Collision: Not required
- Comprehensive: Not required

His liability coverage will cover the lawsuit. The deductible does not apply to the liability portion of the car insurance. (2 marks)

He will need to pay for the car repairs ($7800) plus the rental car ($380) for a total of **$8,180.** His deductible does not apply because he does not have collision coverage and therefore none of those repairs are covered. (4 marks)

(b) Explain who would cover the damage to the other driver's car and why. (3 marks)

Ontario has a no-fault insurance clause which means that the other driver's insurance company will pay for the damage to his car. If the other driver did not have insurance, then the uninsured driver coverage would cover Andre and would not have to pay directly for that damage. This coverage is standard in most insurance policies.