Fin 4713
Introduction

Loan Amortization
Use of Financial Calculator

Interest Due

- Interest Due is the mirror image of interest earned
- In Principles of Finance you learned that interest earned is:
  - Interest rate * Amount Deposited
- Interest due is:
  - Interest rate * Amount Borrowed

Periodic Interest Rate

- The periodic interest rate is the APR divided by the periods per year
- For mortgages, the period is usually one month
- The monthly interest rate charged can then be computed as:
  - **APR%/1200**

Interest Due Example

- You borrowed $250,000 last month at 6 3/8%. How much interest is due now?
- 250,000*6.375/1200 = 1328.13
- If you make a payment more than 1328.13, you will be "amortizing" your loan
- If you make a payment less than 1,328.13 you will have negative amortization, or more pleasantly called, positive accrual

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Application of payments to loan balances

- Your loan contract will specify the use of payments on your loan. Typically money will first be used to make up any arrears in payments or any penalties you have incurred
- If you are paying according to schedule, your payment will first be applied to interest due.
- Any amount of your payment that exceeds the interest due will be used to amortize (pay down) the principal

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Amortization Example

- For the previous Interest Due example, say you made of payment of $1500.
- First the 1328.13 interest would be subtracted from your payment and the remaining amount (1500 – 1328.13 = 171.88) would be used to pay down the principal. Your new principal amount would be
- 250,000.00 – 171.88 = 249,828.12

Loan Amortization

- If your loan payment and interest rate are constant, your calculator can do the amortization calculations for you.
- If you loan payment changes every month, and if the interest rate changes every month, you will need to do a month by month amortization of the loan which allows for these changes.
- See handout

Calculator hints

- Clear the calculator before new problems (Use the ▊ C ALL)
- Make sure:
  - The desired number of decimal places are displayed
    - Set using ▊ DISP followed by entering a digit
  - You have the correct payments (periods) per year
    - Set by typing a number then press ▊ P/YR
    - Check by holding down ▊ C ALL

Calculator hints (continued)

BEGIN indicator is not displayed, unless you are told this problem has beginning of period cash flows
- Set using ▊ BEG/END

If you have a comma where you should have a decimal point (European notation) then toggle to decimal by:
- Toggle using ▊ ./,

Notation when using Calculator

- P/YR = 12 (indicate the periods per year)
- PMT(PV=-270,000, I/Yr = 6, N=180) = 2278.41
- Order of inputs does not matter
- Negative sign for PV indicates a cash outflow
- N = number of periods
- I/YR = stated annual interest rate
- The last button one pushes is what you want to solve for: in this case PMT.

Amortization function on Calculator

- After computing the loan payment, one sets up the Amortization table in the calculator by entering the starting period and pressing the INPUT key, and then entering the ending period and pressing the ▊ AMORT key.
- Press the = key to cycle through the principal paid, the interest paid, and the ending balance.

Amortization Example

- For the previous example, how much interest will be paid in the second year?
- First solve for the monthly payment
  - PMT(PV=-270,000, I/Yr = 6, N=180) = 2278.41
- Then:
  - 13 INPUT
  - 24 ▊ AMORT
- Press the = sign twice to get the interest payment of 15,182.12