Section 11.1 (Credit Cards)

• What is a Credit Card?
  – Paying for things with borrowed money. Each time you use your credit card, it’s a mini-loan.
  – Why people use credit cards
    * Sometimes you really need the loan
    * Sometimes it’s more convenient than cash
    * Sometimes you can avoid large cash deposits (i.e. hotel room)
    * Sometimes credit cards offer perks (i.e. frequent flier miles)

  – Since Credit Cards are a loan, they have interest
    * Usually rates much higher than other loans
    * Because credit card loans don’t have collateral
    * You will be required to repay at least some of your charges every month (minimum monthly payment)
    * You can wait to repay the loan... at a high interest price.

• Other Cards
  – Debit Card
    * Purchases made are withdrawn from your bank account immediately, so there is no loan (and no interest)
    * This means you need to get the money into your account before you make a purchase
  – Travel and Entertainment Card (T&E Card)
    * Traditional American Express cards used to be T&E Cards
    * Usually require you to repay all purchases each month (so no interest will be charged)

• Calculating Credit Card Interest
  – To calculate interest, you need to know the amount of the loan:
– Usually Average Daily Balance (ADB)

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Activity</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 1</td>
<td>Start of Month</td>
<td>$300</td>
</tr>
<tr>
<td>May 4</td>
<td>Charged $200</td>
<td>$500</td>
</tr>
<tr>
<td>May 6</td>
<td>Charged $100</td>
<td>$600</td>
</tr>
<tr>
<td>May 27</td>
<td>Paid $250</td>
<td>$350</td>
</tr>
<tr>
<td>May 29</td>
<td>Charged $2,000</td>
<td>$2,350</td>
</tr>
</tbody>
</table>

– What would you estimate is this person’s ‘average’ daily balance? why?

– Calculating Average Daily Balance (Efficiently)

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Activity</th>
<th>Balance</th>
<th>Days at balance</th>
<th>(Balance)(Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 1</td>
<td>Start of Month</td>
<td>$300</td>
<td>4 – 1 = 3</td>
<td>$900</td>
</tr>
<tr>
<td>May 4</td>
<td>Charged $200</td>
<td>$500</td>
<td>6 – 4 = 2</td>
<td>$1,000</td>
</tr>
<tr>
<td>May 6</td>
<td>Charged $100</td>
<td>$600</td>
<td>27 – 6 = 21</td>
<td>$12,600</td>
</tr>
<tr>
<td>May 27</td>
<td>Paid $250</td>
<td>$350</td>
<td>29 – 27 = 2</td>
<td>$700</td>
</tr>
<tr>
<td>May 29</td>
<td>Charged $2,000</td>
<td>$2,350</td>
<td>31 – 29 = 2</td>
<td>$4,700</td>
</tr>
</tbody>
</table>

– Calculating ADB Efficiently:

* Make a table with one row for starting balance, and one row for each day the balance changed
* Calculate the number of days at each balance
* For each row compute (Balance) × (Days at Balance)
* Add up the numbers from the previous step, then divide by the number of days in the billing period.

– Calculating Credit Card Interest

\[ I = PRT \]

\[ I = \text{interestcharged} \]

\[ P = \text{Principal (ADB)} \]

\[ R = \text{interest rate (as a decimal)} \]

\[ T = \text{term of loan (in years)} \]

• Example: Assume the person in the example above has an interest rate on their credit card of 16.99%, calculate the interest they would owe for May.
• The Grace Period on Credit Card Interest
  – Most credit cards have a grace period of 20 or 25 days beginning on the card’s billing date.
  – So if you paid last month’s balance in full (so none of it carries over and goes past grace period) and if you pay this month’s balance before the grace period is over, you will pay no interest.

• Fees and Expenses
  – *Annual Fee*: An amount of money the credit card may charge users per year
  – *Commissions*: Fees the credit card company charges merchants.

• Choosing the best deal
  – Ideally you’d like a credit card with low (or no) annual fee and a very low interest rate.
  – If you can’t find that determining which is better depends on how much of a monthly balance you think you’ll carry.

  – Calculating the best deal
    * By comparing how much in interest and fees each card will charge you per year.
    * Take the (expiated) average daily balance and calculate the yearly interest
    * And the yearly interest to any annual fees.
    * Choose the cheapest option.

• Rewards Cards
1. The billing period for Peter’s credit card begins on the 5th of each month. On October 5 his balance was $650.00. On Oct. 12 he charged $75.00, on Oct. 15 he paid $300.00. On October 24 he charged $120.15, and on October 31 he charged $145.20. Finally on November 2 he paid $350.00.

(a) Find Peter’s average daily balance for this billing period.
(b) Find the interest due for this billing period if Peter’s interest rate is 12.5% (assume no grace period)

2. Will the following people owe any interest on their credit card statements? (assume their grace periods are 25 days)

(a) Larry’s credit card billing ends on the 20th of each month. On April 20th his bill was $1,004.52. On April 25th he paid $800.00. On May 1st he charged $15.99, on May 8 he charged $314.15 and on May 19 he charged $78.99. Will he be charged any interest on his May 20th bill?
(b) Curly’s credit card billing ends on the 10th of each month. On February 10th his bill was $640.23. On February 14th he charged $94.25, on February 17th he charged $28.48, on February 26th he paid $640.23 and on March 2nd he charged $210. Will he be charged any interest on his March 10th bill?
(c) Mo’s credit card billing ends on the 15th of each month. On December 13th his bill was $994.92. On December 23rd he charged $390.95, on December 28th he charged $83.50, on January 5th he charged $205.30, and on January 13th he paid $1100. Will Mo be charged any interest on his Jan 15th bill?

3. Gene bought $123.85 worth of groceries for thanksgiving. The credit card company charges the grocery store 50 cents per transaction plus 1.3% of the amount charged.

(a) How much will the credit card charge the store in fees and commissions?
(b) How much will the credit card company pay the grocery store for Gene’s $123.85 charge?

4. Several friends are looking for the best deal on credit cards. They find the following information on credit cards offered by 3 banks:

<table>
<thead>
<tr>
<th>Card Issuer</th>
<th>APR</th>
<th>Annual Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank A</td>
<td>23%</td>
<td>none</td>
</tr>
<tr>
<td>Bank B</td>
<td>15.5%</td>
<td>$20</td>
</tr>
<tr>
<td>Bank C</td>
<td>8.99%</td>
<td>$85</td>
</tr>
</tbody>
</table>

(a) If Xiu-Mei estimates she will carry a monthly balance of $300, which credit card is the best choice for her?
(b) If Yan needs to use his credit card for several large purchases he won’t be able to pay off right away, and estimates he will carry an average balance of $1350 each month, which credit card is the best choice for him?
(c) If Zander estimates he will always pay off his balance in full every month, which credit card is the best choice for him?