

CMPS 80B-Fall 2007
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Lab #1 Key

1. At the end of the 8th your bank account has \$3570.00, so it takes 8 months.
2. At the end of the 12th month (first year), I have \$5355.00; at the end of the second year, it's \$10,710.
3. Income and expenditure lines never cross.
4. Yes, income crosses bank account. This occurs during the 3rd month.
5. a) With 15 hours of work per week, it takes 14 months to get \$3500.
b) Even with \$10/hour, it still takes 14 months.
c) With the addition of the entertainment expense it would take 17 months.
d) At the end of the first year, you have \$2775 in the bank. Without considering the birthday gift for the second year, you will exceed \$3500 in April (month = 16). So that means, if you were born in April or later, it will take 16 months. If you were born in January, February or March, it takes 15 months.
6. To model the interest income, you need two inputs into the interest income converter: the interest rate converter and the bank account stock itself.

The amount added to your monthly income is given by the equation:

$$\text{Amount_added}(t) = 1280 * \text{EXP}(0.00358270405 * t) - 1280$$

The exponential growth rate for increase income can be found using the exponential regression tool from the class website.

With the interest income, at the end of the first year, you have \$5659.57 and at the end of the second year, you have \$12036.91.

With 1% of additional income per month, your bank account at the end of the 7th month goes from \$3123.75 to \$3219.04. This does not exceed your goal of \$3500.00 so that means, you still need 8 months.

However with no interest income, but with working 22 hours a week, your income at the end of the 7th month is \$3669.75, which means working 22 hours a week gets you to your goal faster by 1 month.

At the end of the 8th months of work (20 hours per week) with interest, you have \$3697.48 in your bank account. Without interest, you have \$3570. Working 1 additional hour means you'll have \$3882 in your bank account which is more than \$3697. This means that you need less than one hour of additional work to cover the interest amount.

To find out exactly how much extra work you need, you can calculate the total amount that interest income contributes by the end of the 8 months: $3697.48 - 3570 = 127.48$. Divide this amount by the number of weeks worked (8 months x 4 weeks per month), further divide by \$9.75 per hour and then multiply the results by 60 to get the number of minutes per week that this amount represents. Doing so will give us:

$$((3697.48 - 3570) / (8 * 4) / 9.75) * 60 = 24.5154$$

or roughly 25 minutes of extra work per week.