

# Excel Proficiency Exercises

Use these exercises to review some key Excel features and practice your Excel skills. For assistance with the exercises, see the document "Guide to the Excel Proficiency Exercises" and the accompanying *Solutions.xls* Excel workbook.

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## 1. Multiplication Table Problem

### Relative, Absolute, and Mixed Addressing

Create a 10x10 multiplication table in a spreadsheet, as shown below. The cells inside the table (i.e., within the black border) should contain only formulas, not numbers. You should find it unnecessary to enter more than a single formula, which can be drag-copied to fill the rest of the table.

	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

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## 2. Olive Oil Pricing Problem

### IF Statements, SUMPRODUCT Function, MIN Function

Olive oil can be purchased according to this price schedule:

For the first 500 gallons	\$23 per gallon
For any of the next 500 gallons	\$20 per gallon
For any oil beyond 1,000 gallons	\$15 per gallon

Create a spreadsheet that will calculate the total price of buying  $x$  gallons of oil, where  $x$  is a number to be entered into a cell on the spreadsheet.

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### **3. Web Service Problem**

#### **Forecasting and Charting**

You have an idea for a new web service that offers customized workouts for subscribers. Build a spreadsheet to calculate:

- 1) the number of new customers each month, and
- 2) the total customer base (cumulative number of customers signed up) each month.

Model projections for 60 months using these two scenarios:

- 1) Total market potential is 1,000,000 customers. Each month you sign up 2% of customers in the market that have not yet signed up.
- 2) Total market potential is initially 1,000,000 customers but grows at 1% per month. Each month you sign up 2% of customers in the market that have not yet signed up.

Use Excel's Chart Wizard wizard to make a graph comparing the total customer base under each of the two scenarios. What type of graph is appropriate?

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### **4. Pro Forma Problem**

#### **Forecasting, Data Table, Goal Seek**

You have founded a company to sell thin client computers to the food processing industry for Internet transaction processing. Before investing in your new company, a venture capitalist has asked for a five year pro-forma income statement showing unit sales, revenue, total variable cost, marketing expense, fixed cost, and profit before tax.

You expect to sell 1,600 units of the thin client computers in the first year for \$1,800 each. Swept along by Internet growth, you expect to double unit sales each year for the next five years. However, competition will force a 15% decline in price each year.

Fortunately, technical progress allows initial variable manufacturing costs of \$1,000 for each unit to decline by 6% per year. Fixed costs are estimated to be \$1,000,000 per year. Marketing expense is projected to be 14% of annual revenue. When it becomes profitable to do so, you will lease an automated assembly machine that reduces variable manufacturing costs by 20% but doubles the annual fixed cost; the new variable manufacturing cost will also decline by 6% per year. Net present value (NPV) will be used to aggregate the stream of annual profits, discounted at 15% per year.<sup>1</sup>

- a) Ignoring tax considerations, build a spreadsheet for the venture capitalist.
- b) How many units do you need to sell in the first year to break even in the first year?
- c) How many units do you need to sell in the first year to break even in the second year?

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<sup>1</sup> Problem 2-5 from *Introductory Management Science*, 5<sup>th</sup> edition (1998), Eppen, Gould, et al.

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## 5. Data Relationship Problem

### Scatter or XY Plot

You want to examine the relationship between the number of machines working and the number of processing minutes achieved. You conduct 18 spot checks every half hour and record the following data. Use Excel's Chart Wizard to make an x-y scatter plot of the data.

# Machines	Minutes
7	97
6	86
5	78
1	10
5	75
4	62
7	101
3	39
4	53
2	33
8	118
5	65
2	25
5	71
7	105
1	17
4	49
5	68