## Modeling Bakery Building Costs

Let us calculate the total cost of constructing the bakery. In modeling the bakery building costs (**BBC**) as a function of the annual capacity **x** of the bakery it is tempting to assume **BBC** = **kx** (where **x** = number of pastries that can be baked per year and **k** is the per unit cost of pastry capacity in dollars($)). **Usually, however, the cost of building is made up of a fixed cost plus a per-unit cost**. We will follow this route and assume

That is, there is a fixed cost of **y** incurred in building a bakery in dollars($).

Other Formulas

If you believe that there is a diminishing cost of adding each unit of capacity you might try a model of the form **BBC = Fixed cost + kxb**, where **0 b 1**. This will ensure that each additional unit of capacity will incur a smaller cost.

#### Let us now start building the model to determine whether opening the new bakery is a good idea.

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In our example, we will assume that fixed cost, **y** = $400,000 incurred in building a bakery and **k** = $3 per unit of pastry capacity. Let us also assume that the annual capacity of the bakery is 300,000 pastries.

**Step 1:** Using the above data, fill in the following inputs in the spreadsheet model for Le Napoleon:

1. Plant fixed cost
2. Cost per unit of capacity
3. Annual capacity

As described in our modeling rules, we have grouped all our inputs together. In Cells B1 through B14, we will enter values of our inputs and decision variables step by step. Decision variables are color coded in blue, input assumptions in yellow and calculations are in orange.



**Step 2:** Now calculate the total cost of construction or the bakery building cost (BBC) using the above equation.  We will assume construction costs are paid on January 1st, 2012.

