A Corporate Health Insurance Example

Lisa Pon has just been hired as an analyst in the corporate planning department of Hungry Dawg Restaurants. Her first assignment is to determine how much money the company needs to accrue in the coming year to pay for its employees' health insurance claims. Hungry Dawg is a large, growing chain of restaurants that specialize in traditional southern foods. The company has become large enough that it no longer buys insurance from a private insurance company. The company is now self-insured, meaning that it pays health insurance claims with its own money (although it contracts with an outside company to handle the administrative details of processing claims and writing checks.)

The money the company uses to pay claims comes from two sources: employee contributions (or premiums deducted from employees' paychecks), and company funds (the company must pay whatever costs are not covered by employee contributions.) Each employee covered by the health insurance plan contributes $125 per month. However, the number of employees covered by the plan changes from month to month as employees are hired and fired, quit or simply add or drop health insurance coverage. A total of 18,533 employees were covered by the plan last month. The average monthly health claim per covered employee was $250 last month.

Source: Cliff Ragsdale, Spreadsheet Modeling and Decision Analysis

Spreadsheet Model

	A	B	C	D	E	F	G
1							
2			Hungry Dawg Restaurants				
3							
4	**Initial Conditions:**				**Assumptions:**		
5	**Number of Covered Employees**			18,533	**Increasing**	2%	**per month**
6	**Average Claim per Employee**			$250	**Increasing**	1%	**per month**
7	**Amount Contributed per Employee**			$125	**Constant**		
8							
9		**Number of**	**Employee**	**Avg Claim**	**Total**		**Company**
10	**Month**	**Employees**	**Contributions**	**per Emp.**	**Claims**		**Cost**
11	1	18,904	$2,362,958	$252.50	$4,773,174		$2,410,217
12	2	19,282	$2,410,217	$255.03	$4,917,324		$2,507,107
13	3	19,667	$2,458,421	$257.58	$5,065,827		$2,607,406
14	4	20,061	$2,507,589	$260.15	$5,218,815		$2,711,226
15	5	20,462	$2,557,741	$262.75	$5,376,423		$2,818,682
16	6	20,871	$2,608,896	$265.38	$5,538,791		$2,929,895
17	7	21,289	$2,661,074	$268.03	$5,706,063		$3,044,989
18	8	21,714	$2,714,295	$270.71	$5,878,386		$3,164,091
19	9	22,149	$2,768,581	$273.42	$6,055,913		$3,287,332
20	10	22,592	$2,823,953	$276.16	$6,238,802		$3,414,849
21	11	23,043	$2,880,432	$278.92	$6,427,214		$3,546,782
22	12	23,504	$2,938,041	$281.71	$6,621,315		$3,683,275
23					**Total Company Cost**		**$36,125,850**
24							

Source: Cliff Ragsdale, Spreadsheet Modeling and Decision Analysis

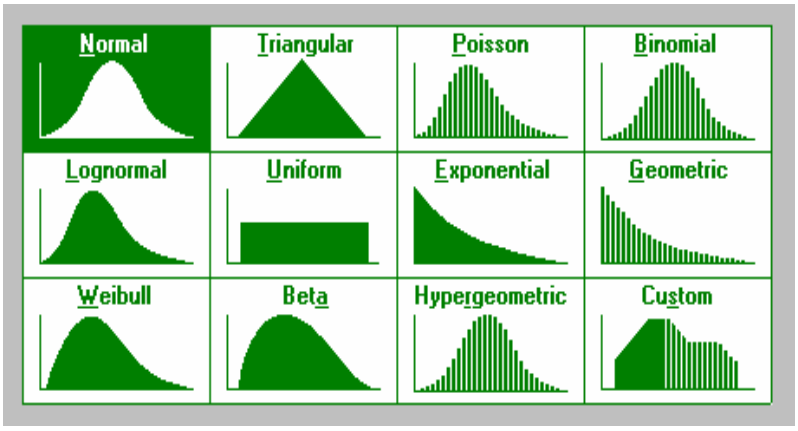
Building Models with Crystal Ball

Define Assumption –
define a probability distribution
for a spreadsheet cell value.

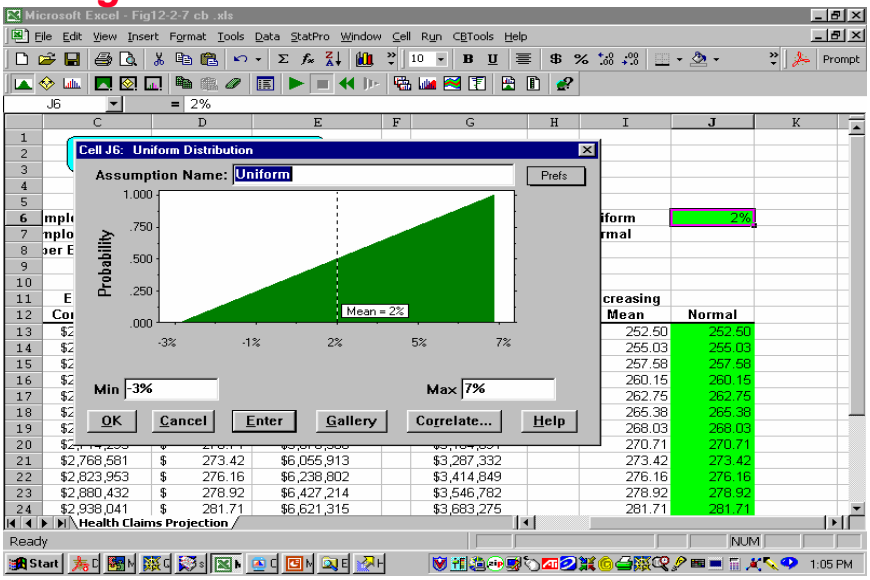
Define Forecast –
define a cell as a simulation
output for which statistics
will be generated.

Run Simulation

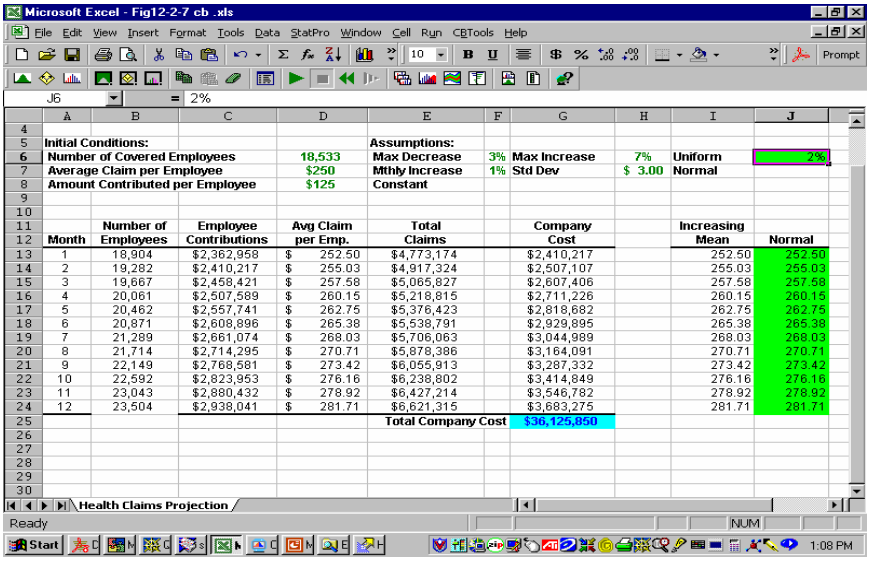
Defining Assumptions: Distributions



Using the Uniform Distribution



Defined Both Assumptions and Forecast



	A	B	C	D	E	F	G	H	I	J
4										
5	Initial Conditions:				Assumptions:					
6	Number of Covered Employees			18,533	Max Decrease	3%	Max Increase	7%	Uniform	2%
7	Average Claim per Employee			$250	Mthly Increase	1%	Std Dev	$ 3.00	Normal	
8	Amount Contributed per Employee			$125	Constant					
9										
10										
11		Number of	Employee	Avg Claim	Total		Company		Increasing	
12	Month	Employees	Contributions	per Emp.	Claims		Cost		Mean	Normal
13	1	18,904	$2,362,958	$ 252.50	$4,773,174		$2,410,217		252.50	252.50
14	2	19,282	$2,410,217	$ 255.03	$4,917,324		$2,507,107		255.03	255.03
15	3	19,667	$2,458,421	$ 257.58	$5,065,827		$2,607,406		257.58	257.58
16	4	20,061	$2,507,589	$ 260.15	$5,218,815		$2,711,226		260.15	260.15
17	5	20,462	$2,557,741	$ 262.75	$5,376,423		$2,818,682		262.75	262.75
18	6	20,871	$2,608,896	$ 265.38	$5,538,791		$2,929,895		265.38	265.38
19	7	21,289	$2,661,074	$ 268.03	$5,706,063		$3,044,989		268.03	268.03
20	8	21,714	$2,714,295	$ 270.71	$5,878,386		$3,164,091		270.71	270.71
21	9	22,149	$2,768,581	$ 273.42	$6,055,913		$3,287,332		273.42	273.42
22	10	22,592	$2,823,953	$ 276.16	$6,238,802		$3,414,849		276.16	276.16
23	11	23,043	$2,880,432	$ 278.92	$6,427,214		$3,546,782		278.92	278.92
24	12	23,504	$2,938,041	$ 281.71	$6,621,315		$3,683,275		281.71	281.71
25					Total Company Cost		$36,125,850			
26										
27										
28										
29										
30										

Crystal Ball Menu

DEFINE
- Assumption
- Decision
- Forecast

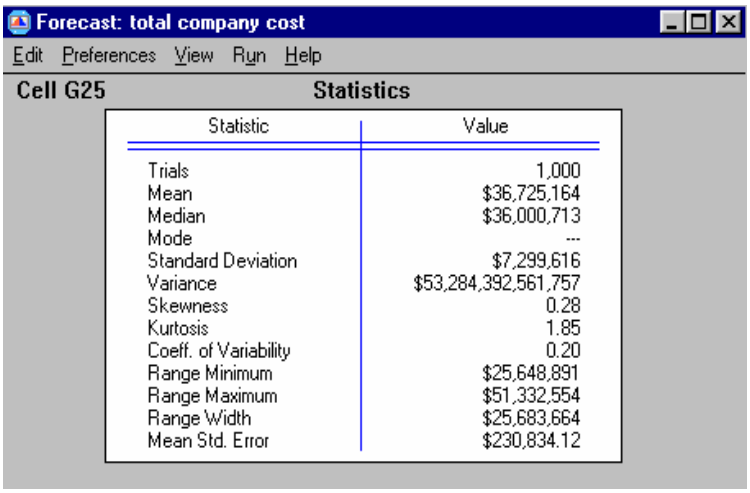
SELECT
- Assumption
- Decision
- Forecast

RUN PREFERENCES

RUN

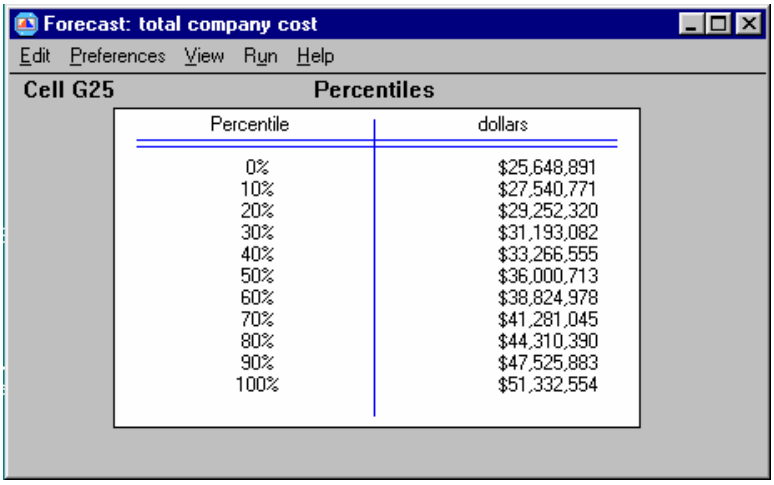
OUTPUTS

Statistics



Statistic	Value
Trials	1,000
Mean	$36,725,164
Median	$36,000,713
Mode	---
Standard Deviation	$7,299,616
Variance	$53,284,392,561,757
Skewness	0.28
Kurtosis	1.85
Coeff. of Variability	0.20
Range Minimum	$25,648,891
Range Maximum	$51,332,554
Range Width	$25,683,664
Mean Std. Error	$230,834.12

Percentiles



Cumulative Chart