Gribbin Brewing Problem

Regional brewer Andrew Gribbin distributes kegs of his famous beer through three warehouses in the greater News York City area, with current supplies as shown in Figure 1.

On a Thursday morning, he has his usual weekly orders from his four loyal customers, as shown in Figure 2. Tracy Chapman, Gribbin's shipping manager, needs to determine the most cost-efficient plan to deliver beer to these four customers, knowing that the costs per keg are different for each possible combination of warehouse and customer (see Figure 3).

What is the optimal shipping plan?

Warehouses	Supply
Hoboken	80
Bronx	145
Brooklyn	120

Figure 1

Bars	Demand
Ratkeller	80
McGoldrick's Pub	65
Night Train Bar & Grill	70
Henry Ale's	85

Figure 2

	Ratkeller	McGoldrick's Pub	Night Train Bar & Grill	Henry Ale's
Hoboken	$4.64	$5.13	$6.54	$8.67
Bronx	$3.52	$4.16	$6.90	$7.91
Brooklyn	$9.95	$6.82	$3.88	$6.85

Figure 3

Phone Survey Problem

For a phone survey, a marketing research group needs to contact at least 1500 young women, 1400 young men, 1100 older women, and 1000 older men. It costs $0.20 to make a call to a landline and $0.50 to make a call to a cell phone since, for regulatory reasons, cell phone numbers need to be dialed manually.

The typical demographics for people answering landline and cell phones calls are provided below.

Person Responding	% of Landline Calls	% of Cell Phone Calls
Young Woman	8	20
Young Man	8	18
Older Woman	20	20
Older Man	20	18
No Answer	44	24

Because of a limited staff, at most half of all phone calls can be cell phone calls.

Determine how to minimize the cost of completing the survey.

Funding a Pension Liability

It is January 1, 2005 and you are managing a Pension Fund. You have a good idea of how much money you will need to pay out during each of the next 15 years. The payments in the following table must be made on January 1 of each year.

Year	Payment
2005	$11,000
2006	$12,000
2007	$14,000
2008	$15,000
2009	$16,000
2010	$18,000
2011	$20,000
2012	$21,000
2013	$22,000
2014	$24,000
2015	$25,000
2016	$30,000
2017	$31,000
2018	$31,000
2019	$31,000

In order to finance these obligations, the following three bonds may be purchased on January 1, 2005 (all coupons are paid on January 1 of each year):
- Bond 1 costs $980 and pays $60 in 2006-2009 and $1060 in 2010.
- Bond 2 costs $970 and pays $65 in 2006-2015 and $1065 in 2016.
- Bond 3 costs $1050 and yields a $75 coupon in 2006-2018 and $1075 in 2019.

Payments from bonds are received in time to be used to meet pension liabilities. During each year you earn 4% interest on your cash. Given the bonds available for purchase today, you would like to find the least amount of money that must be set aside today to ensure that you can make all pension payments.

Build a spreadsheet model to help you determine the minimum amount of money you need to provision and the bonds to purchase on January 1, 2005 to ensure that you will meet all pension liabilities.