1. Your friend asks to borrow $1000, promising to repay you in one year. Given his characteristics (e.g. the likelihood that he will pay back the loan) and your patience (e.g. how willing you are to give up spending today for future spending), you would be willing to part with $1000 today if you could have the ability to buy $1100 worth of good stuff in a year. Forecaster predict that the rate of inflation will be 3% over the coming year. What interest rate will you charge your friend to borrow $1000, and why?

We are assuming that the real interest rate that you require to make a loan is 10% -- you want 10% more in real spending next year. If you expect inflation to be 3%, you would be willing to lend $1000 if the nominal interest rate were 13%. If indeed inflation is 3%, your real interest rate is the desired level of 10%.

2. Draw a circular flow diagram -- sectors, markets and arrows representing the flow of funds between sectors through markets. To simplify, assume that there is no ROW and no depreciation. (Try to do this from memory, without simply copying from your notes, and be sure to include all relevant arrows.) Now, indicate the appropriate values next to the appropriate arrows if we have the following information: total spending (GDP) = $150,000, investment (I) = 10,000, government purchases (G) = 20,000 and net taxes (T) = 10,000. Hint: use the basic principle of the circular flow that the value of arrows going into a sector or market must equal the value of arrows coming out.

See diagram after problem 6 of this answer sheet.

3. Use the circular flow model to predict the effect of an increase in the government’s budget deficit on national saving and gross investment. (Be careful here; the correct answer may not be as straightforward as you think.)

The circular flow model shows the sources of investment: \( I = S - (G - T) - NX \). If the government budget deficit gets larger, then \( I \) will fall, ceteris paribus. But the circular flow model makes no predictions about how household saving (\( S \)) and foreign borrowing (\( NX \)) respond to a change in the deficit. If, say, \( S \) rises by the same amount that the deficit increases, there would be no change in \( I \). Thus, changes in the deficit need not affect investment. What we need are assumptions about economic behavior; i.e. economic theory.
4. How would each of the following affect US GDP in the year 2002? In which spending or income category, if any, would each be included?

   a) You rent a hotel room in Paris (and you should, someday)
      *This is a US import, so it would decrease net exports.*

   b) A French household buys a meal in Atlanta.
      *US net exports increase and GDP increases.*

   c) You buy a house in Athens built in the year 2002.
      *Residential investment increases and GDP increases.*

      *GDP in 2002 would not be affected. C would rise, but I would fall by the same amount.*

   e) A firm buys a new bulldozer.
      *Investment and GDP increase.*

   f) The Federal government pays for a road to be built from Athens to Atlanta.
      *G and GDP increase.*

   g) Your employer pays for your labor by adding to your pension fund.
      *This would increase payments for labor and aggregate income. Thus, this would indirectly be a part of GDP.*

   h) The Federal government increases tax revenues.
      *We really can’t say how this affects GDP. It is likely to reduce household consumption and/or saving.*

5. Consider an economy that produces three goods (A, B and C). We collect the following information about quantities produced and market prices during the years 2000 and 2001. Compute:

   a) the chained growth rate of real GDP from 2000 to 2001 = 6.87%

   b) real GDP in 2001 in terms of 2000 dollars = 43,817.55

   c) the GDP deflator in 2001 = 1.15

<table>
<thead>
<tr>
<th></th>
<th>P</th>
<th>Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>2000</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>3000</td>
</tr>
<tr>
<td>C</td>
<td>10</td>
<td>2500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>P</th>
<th>Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>2.5</td>
<td>2500</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>3200</td>
</tr>
<tr>
<td>C</td>
<td>12</td>
<td>2600</td>
</tr>
</tbody>
</table>
6. Suppose that Publix runs the following advertisement: “We measured what the average Publix shopper bought last week, and that same basket of groceries would have cost 3% more at Krogers.” The same newspaper also contains an ad from Kroger: “We measured what the average Kroger shopper bought last week, and that same basket of groceries would have cost 3% more at Publix.” Neither grocery chain is lying. What is going on? How is this example related to the bias in the CPI? (If you’ve read Landsburg, you’ll know the answer immediately.)

What the Publix shopper bought last week depended on the prices at Publix. Thus, she tended to buy things that were cheaper than things that were more expensive. Presumably, some of the things on sale at Publix were not on sale at Kroger, so if the Publix shopper had shopped at Kroger, she would have bought different things. Pricing the basket she buys at Publix using prices at Kroger will over estimate prices at Kroger. We would have the same story from the average Kroger shopper point of view.

The CPI is based on the same principle that the calculations above are based on – the goods that are contained in the consumer’s basket do not change from one period to the next (just as the average Publix shopper’s basket didn’t change when she hypothetically shopped at Kroger). Thus, because the ability (and likelihood) that consumers will substitute out of expensive goods into less expensive goods puts an upward bias on the CPI.