EC9012 Macroeconomics

Week 3 - Problem Set 1

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Question - 1 -

Question 1

Which of the following transactions will be included in the GDP for the United States? Explain why.

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Gross domestic product (GDP) is the market value of all final goods and services produced within a country in a given period of time .

a) *Coca Cola builds a new bottling plant in the United States.*

Investment

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YES:

It is an investment spending and included in GDP

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YES:

It is an investment spending and included in GDP

Remember:

$$Y = C + I + G + NX$$

- Coca Cola Investment

GDP is a Flow

b) *Northwest Airlines sells one of its existing airplanes to Korean Air.*

GDP is a Flow

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NO:

It does not represent production in the current time period. The plane was already included in the production year, so sale of used item is not part of GDP.

GDP is a Flow

b) *Northwest Airlines sells one of its existing airplanes to Korean Air.*

NO:
It does not represent production in the current time period. The plane was already included in the production year, so sale of used item is not part of GDP.

Remember:
Gross domestic product (GDP) is the market value of all final goods and services produced within a country in a given period of time

- GDP is a flow

c) *Ms. Moneybags buys an existing share of Disney stock.*

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NO:

When an individual buys an existing share of stock the transaction is a financial one, therefore it is not included in the GDP.

c) *Ms. Moneybags buys an existing share of Disney stock.*

NO:

When an individual buys an existing share of stock the transaction is a financial one, therefore it is not included in the GDP.

Remember:

Gross domestic product (GDP) is the market value of all final goods and services produced within a country in a given period of time

- Financial transactions do not involve production

d) *A California winery produces a bottle of Chardonay and sells it to a customer in Montreal.*

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YES:

It is an export and is entered in US GDP

d) *A California winery produces a bottle of Chardonay and sells it to a customer in Montreal.*

YES:

It is an export and is entered in US GDP

Remember:

$$Y = C + I + G + NX$$

- From California(US) to Montreal(Canada)

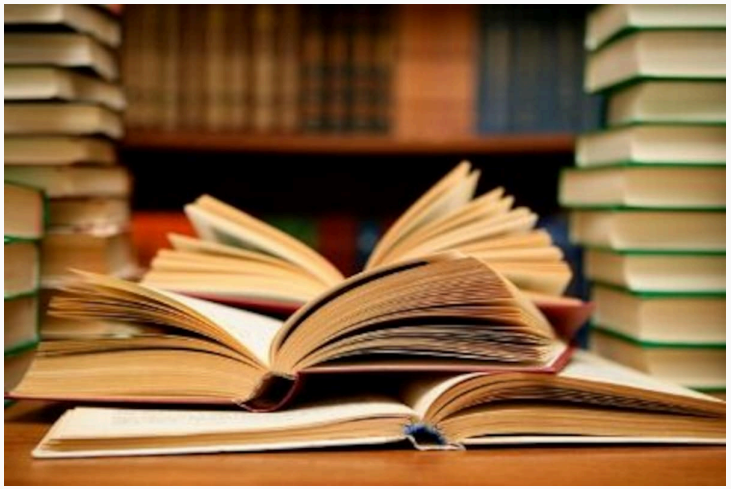
e) *An American buys a bottle of French perfume at Macy's in New York*

e) *An American buys a bottle of French perfume at Macy's in New York*

NO:

When an American buys a bottle of French perfume, it is a consumption expenditure as measured by GDP. **But** since it does not represent production in the United States, it is also deducted from GDP as an import. The net effect of the transaction does not change GDP in the United States

f) *A book publisher produces too many copies of a new book. The books do not sell this year, so the publisher adds the surplus to inventories.*



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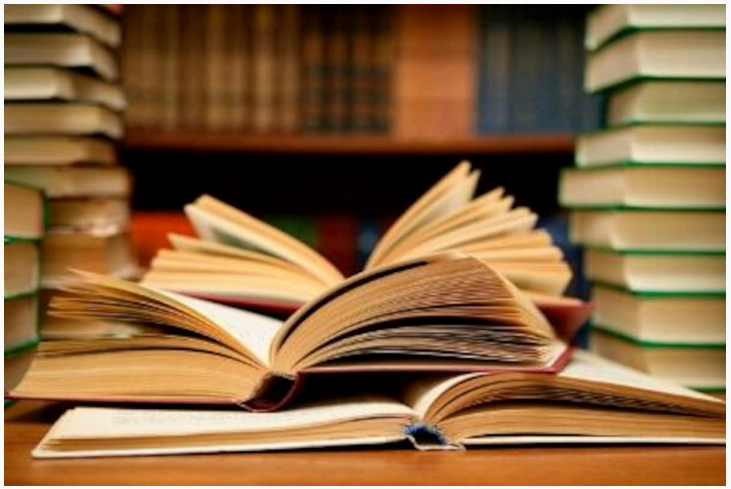


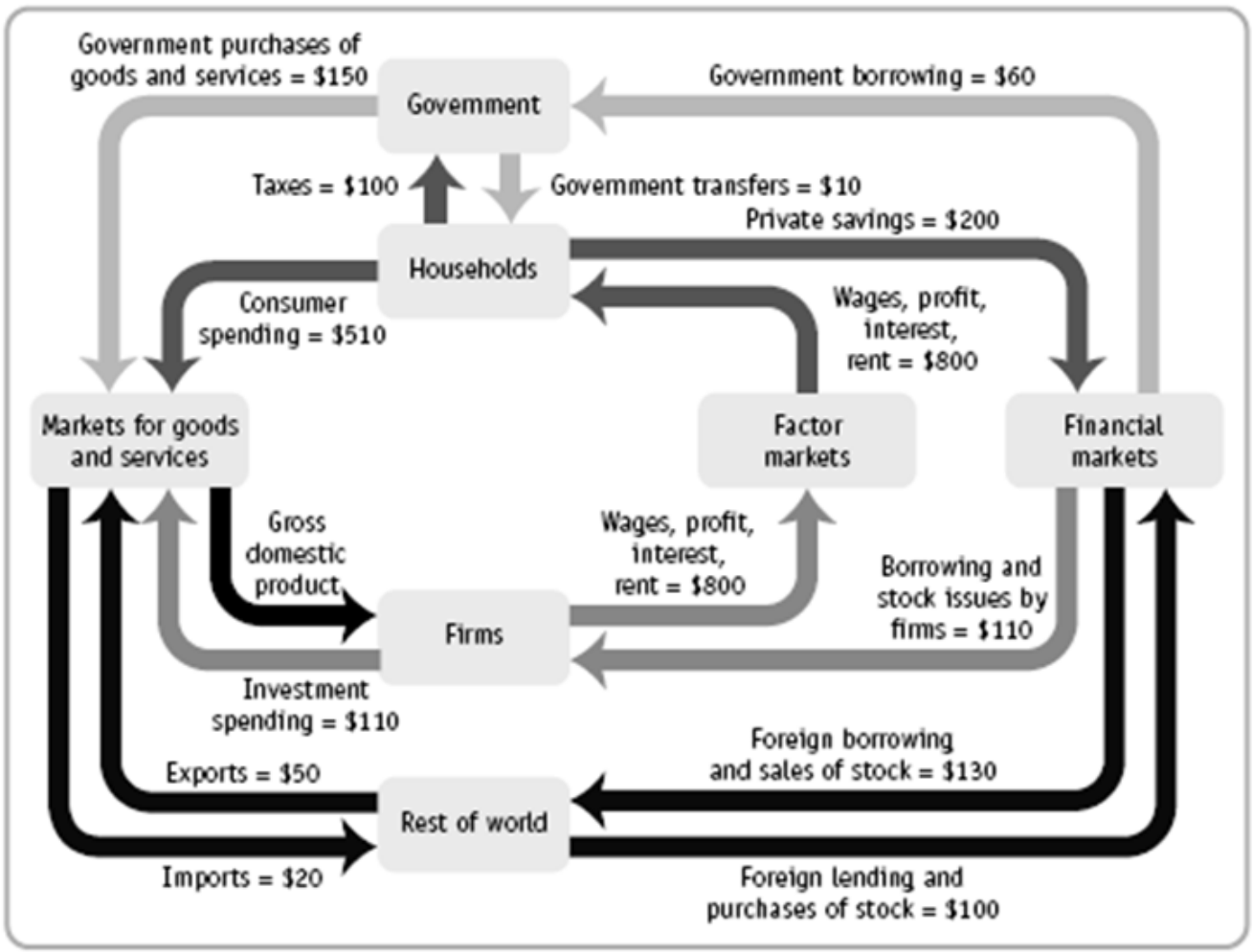
NO:

If a book publisher produces too many copies of a new book and the books do not sell in the year they are produced, the publisher adds the surplus books to inventories. These books are considered investment spending and added to GDP. It is as if the publisher bought the books itself. In other words, inventories are part of the investment.

Question - 2 -

Question 2

Using the circular-flow diagram for the economy of Macronia above, answer the following questions:



a) What is the value of GDP in Macronia?

We can measure GDP in Macronia as the sum of all spending on domestically produced final goods and services. Spending consists of consumer spending, investment spending, government purchases of goods and services, and exports less imports.

Consumer Spending	
Investment	
Government Purchases	
Export	
Import(-)	
GDP	

$$Y = C + I + G + NX$$

a) What is the value of GDP in Macronia?

We can measure GDP in Macronia as the sum of all spending on domestically produced final goods and services. Spending consists of consumer spending, investment spending, government purchases of goods and services, and exports less imports.

Consumer Spending	$510
Investment	
Government Purchases	
Export	
Import(-)	
GDP	

$$Y = C + I + G + NX$$

a) What is the value of GDP in Macronia?

We can measure GDP in Macronia as the sum of all spending on domestically produced final goods and services. Spending consists of consumer spending, investment spending, government purchases of goods and services, and exports less imports.

Consumer Spending	$510
Investment	$110
Government Purchases	
Export	
Import(-)	
GDP	

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a) What is the value of GDP in Macronia?

We can measure GDP in Macronia as the sum of all spending on domestically produced final goods and services. Spending consists of consumer spending, investment spending, government purchases of goods and services, and exports less imports.

Consumer Spending	$510
Investment	$110
Government Purchases	$150
Export	
Import(-)	
GDP	

$$Y = C + I + G + NX$$

a) What is the value of GDP in Macronia?

We can measure GDP in Macronia as the sum of all spending on domestically produced final goods and services. Spending consists of consumer spending, investment spending, government purchases of goods and services, and exports less imports.

Consumer Spending	\$510
Investment	\$110
Government Purchases	\$150
Export	\$50
Import(-)	
GDP	

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We can measure GDP in Macronia as the sum of all spending on domestically produced final goods and services. Spending consists of consumer spending, investment spending, government purchases of goods and services, and exports less imports.

Consumer Spending	\$510
Investment	\$110
Government Purchases	\$150
Export	\$50
Import(-)	\$20
GDP	

$$Y = C + I + G + NX$$

a) What is the value of GDP in Macronia?

We can measure GDP in Macronia as the sum of all spending on domestically produced final goods and services. Spending consists of consumer spending, investment spending, government purchases of goods and services, and exports less imports.

Consumer Spending	$510
Investment	$110
Government Purchases	$150
Export	$50
Import(-)	$20
GDP	**$800**

$$Y = C + I + G + NX$$

Question 2b: What is the value of disposable income?

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Wages, Profits, Interests	
Taxes (-)	
Government Transfers	
Disposable Income	

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Wages, Profits, Interests	$800
Taxes (-)	
Government Transfers	
Disposable Income	

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Disposable income is income received by households less taxes plus government transfers.

Wages, Profits, Interests	$800
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Government Transfers	
Disposable Income	

Question 2b: What is the value of disposable income?

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Disposable income is income received by households less taxes plus government transfers.

Wages, Profits, Interests	$800
Taxes (-)	$100
Government Transfers	$10
Disposable Income	

Question 2b: What is the value of disposable income?

Remember!

Disposable income is income received by households less taxes plus government transfers.

Wages, Profits, Interests	$800
Taxes (-)	$100
Government Transfers	$10
Disposable Income	**$710**

Question 2c: Household Flow of Money

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Does the total flow of money out of households—the sum of taxes paid, consumer spending, and private savings—equal the total flow of money into households in terms of factor incomes and transfers?

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Flow of Money out of Households

Consumer Spending	$510
Taxes	$100
Private Saving	$200
Flow of Money out of Households	**$810**

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Consumer Spending	$510
Taxes	$100
Private Saving	$200
Flow of Money out of Households	**$810**

Flow of Money into Households

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Flow of Money out of Households

Consumer Spending	$510
Taxes	$100
Private Saving	$200
Flow of Money out of Households	**$810**

Flow of Money into Households

Wages, Profits, Interests	$800
Government Transfers	$10
Flow of Money into Households	**$810**

Answer Question 2c

Yes. Consumer spending + taxes + private savings equals $810— the same as the wages, profit, interest, rent, and government transfers received by households.

Question 2d: Government Finance

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How does the government finance its spending?

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Government Spending

Government Purchases	$150
Government Transfers	$10
Government needs to finance	**$160**

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How does the government finance its spending?

Government Spending

Government Purchases	$150
Government Transfers	$10
Government needs to finance	**$160**

Financing Government

Tax Revenue	$100
Borrowing	$60
Financing Government	**$160**

Question 2d: Government Finance

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How does the government finance its spending?

Government Spending

Government Purchases	$150
Government Transfers	$10
Government needs to finance	**$160**

Financing Government

Tax Revenue	$100
Borrowing	$60
Financing Government	**$160**

Answer Question 2d

In Macronia, the government needs to finance $160 in spending ($150 on purchases of goods and services and $10 in government transfers). The government finances $100 of its spending with tax revenue and the other $60 through borrowing in financial markets.

Question - 3 -

Question 3

The small economy of Pizzania produces three goods: Bread, Cheese and Pizza, each produced by separate company. The bread and cheese companies produce all the inputs they need to make bread and cheese respectively. The pizza company uses the bread and cheese from the other companies to make Pizza. All three companies employ labor to help produce their goods, and the difference between the value of goods sold and the sum of labor and input costs is the firm's profit. The accompanying table summarizes the activities of the three companies when some of the bread and cheese produced are sold to the pizza company as inputs in the production of pizza and to consumer as final goods:

	Bread Company	Cheese Company	Pizza Company
Cost of Inputs	$0	$0	$50 Bread $35 Bread
Wages	$25	$30	$75
Value of Output	$100	$60	$200

Question 3a:

Question 3

a) Calculate GDP as the value added in production

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Value added in bread company is $100, in cheese company $60 and pizza company is $115 ($200-$50-$35). Total value added of production is $275.

Value added in	
Bread Company	$100
Cheese Company	$60
Pizza Company	$115
Total Value Added Production	**$275**

Question 3c

b) Calculate GDP as spending on final goods and services

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To calculate GDP as spending on final goods and services, we need to sum the value of bread, cheese and pizzas sold as final goods. GDP equals $275 because the bread company sells $50 worth of final goods, cheese company sells $25 and $200 worth of pizza.

Final goods in which	
Bread Company sells	$50
Cheese Company sells	$25
Pizza Company selss	$200
Total Value of Final Goods	**$275**

Question 3c:

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c) Calculate GDP as factor income (i.e. wages, interest, rental and profits)

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Companies	Wages	Profits	Total
Bread Company	$25	$75	$100
Cheese Company	$30	$30	$60
Pizza Company	$75	$40	$115
The Sum of All Factor Incomes			**$275**

Question - 4 -

Question 4

The economy of Britannica consumes and produces three goods: Computers, DVDs and pizza. The accompanying table shows the prices and output of the three goods for years 2005, 2006, 2007. Hint: Use Excel Spreadsheet for your computations.

	Computers		**DVDs**		**Pizza**	
Years	Prices	Quantity	Prices	Quantity	Prices	Quantity
2005	$900	$10	$10	$100	$15	$2
2006	$1000	$10.5	$12	$105	$16	$2
2007	$1050	$12	$14	$110	$17	$3

Question 4a:

	Computers		DVDs		Pizza	
Years	Prices	Quantity	Prices	Quantity	Prices	Quantity
2005	$900	$10	$10	$100	$15	$2
2006	$1000	$10.5	$12	$105	$16	$2
2007	$1050	$12	$14	$110	$17	$3

Question 4a

What is the **percent change in production** of each of the goods from 2005 to 2006, 2006 to 2007?

- From 2005 to 2006, the percent change in the production of

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Question 4a

What is the **percent change in production** of each of the goods from 2005 to 2006, 2006 to 2007?

- From 2005 to 2006, the percent change in the production of
  - **Computers** is 5.0%(equal to $(10.5 - 10)/10 \times 100$)
  - **DVDs**, 5.0% (equal to $(105 - 100)/100 \times 100$)
  - **Pizza**, 0% (equal to $(2 - 2)/2 \times 100$)
- From 2006 to 2007, the percent change in the production of

Question 4a:

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  - **DVDs**, 5.0% (equal to $(105 - 100)/100 \times 100$)
  - **Pizza**, 0% (equal to $(2 - 2)/2 \times 100$)
- From 2006 to 2007, the percent change in the production of
  - **Computers** is 14.3% (equal to $(12 - 10.5)/10.5 \times 100$)
  - **DVDs**, 4.8% (equal to $(110 - 105)/105 \times 100$)
  - **Pizza**, 50.0%(equal to $(3 - 2)/2 \times 100$)

Question 4b:

	Computers		DVDs		Pizza	
Years	Prices	Quantity	Prices	Quantity	Prices	Quantity
2005	$900	$10	$10	$100	$15	$2
2006	$1000	$10.5	$12	$105	$16	$2
2007	$1050	$12	$14	$110	$17	$3

Question 4b

What is the **percent change in prices** of each of the goods from 2005 to 2006, 2006 to 2007?

- From 2005 to 2006, the percent change in the price of

- From 2006 to 2007, the percent change in the price of

Question 4b:

	Computers		DVDs		Pizza	
Years	Prices	Quantity	Prices	Quantity	Prices	Quantity
2005	$900	$10	$10	$100	$15	$2
2006	$1000	$10.5	$12	$105	$16	$2
2007	$1050	$12	$14	$110	$17	$3

Question 4b

What is the **percent change in prices** of each of the goods from 2005 to 2006, 2006 to 2007?

- From 2005 to 2006, the percent change in the price of
  - **Computers** is 11.1% (equal to ($1,000 –$900)/$900 × 100);
  - **DVDs**, 20.0% (equal to ($12 –$10)/$10 × 100);
  - **Pizza**, 6.7% (equal to ($16 –$15)/$15 × 100)
- From 2006 to 2007, the percent change in the price of

Question 4b:

	Computers		DVDs		Pizza	
Years	Prices	Quantity	Prices	Quantity	Prices	Quantity
2005	$900	$10	$10	$100	$15	$2
2006	$1000	$10.5	$12	$105	$16	$2
2007	$1050	$12	$14	$110	$17	$3

Question 4b

What is the **percent change in prices** of each of the goods from 2005 to 2006, 2006 to 2007?

- From 2005 to 2006, the percent change in the price of
  - **Computers** is 11.1% (equal to ($1,000 –$900)/$900 × 100);
  - **DVDs**, 20.0% (equal to ($12 –$10)/$10 × 100);
  - **Pizza**, 6.7% (equal to ($16 –$15)/$15 × 100)
- From 2006 to 2007, the percent change in the price of
  - **Computers** is 5.0% (equal to ($1,050 –$1,000)/$1,000 × 100);
  - **DVDs**, 16.7% (equal to ($14 –$12)/$12 × 100);
  - **Pizza**, 6.25% (equal to ($17 – $16)/$16 × 100)

Question 4c

Calculate the nominal GDP for each year? What is the percentage change in nominal GDP from 2005 to 2006 and from 2006 to 2007?

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Year	Nominal GDP	Nominal GDP Rate of Change
2005	$10,030	
2006	$11,792	17.6%
2007	$14,191	20.3%

Question 4d

Calculate the real GDP using 2005 prices for each of the three years. What is the percentage change in real GDP from 2005 to 2006 and from 2006 to 2007?

Question 4d

Calculate the real GDP using 2005 prices for each of the three years. What is the percentage change in real GDP from 2005 to 2006 and from 2006 to 2007?

Year	Real GDP	Real GDP Rate of Change
2005	$10,030	
2006	$10,530	5%
2007	$11,945	13.4%

Question 4e:

Question 4e

Using the year 2005 as the base year, compute the following statistics for each year. Compare the answers and explain the difference.

- ***The Implicit Price Deflator for GDP (Paasche Index) and Inflation***

- ***Assume consumer basket is composed of quantities in year 2005, calculate the fixed weight price index such as CPI (Laspeyres Index) and Inflation.***

Question 4e

Using the year 2005 as the base year, compute the following statistics for each year. Compare the answers and explain the difference.

- ***The Implicit Price Deflator for GDP (Paasche Index) and Inflation***

Year	Nominal GDP	Real GDP	GDP Deflator	Inflation %
2005	$10,030	10,030	100.000	
2006	$11,792	10,530	111.984	11.98
2007	$14,191	11,945	118.802	6.09

- ***Assume consumer basket is composed of quantities in year 2005, calculate the fixed weight price index such as CPI (Laspeyres Index) and Inflation.***

Question 4e

Using the year 2005 as the base year, compute the following statistics for each year. Compare the answers and explain the difference.

- ***The Implicit Price Deflator for GDP (Paasche Index) and Inflation***

Year	Nominal GDP	Real GDP	GDP Deflator	Inflation %
2005	$10,030	10,030	100.000	
2006	$11,792	10,530	111.984	11.98
2007	$14,191	11,945	118.802	6.09

- ***Assume consumer basket is composed of quantities in year 2005, calculate the fixed weight price index such as CPI (Laspeyres Index) and Inflation.***

	Computers	2005	DVD	2005	Pizza	2005			
Year	Price	Qty	Price	Qty	Price	Qty	Basket Cost	CPI	Inflation%
2005	$900	10	10	100	15	2	$10,030	100.000	
2006	$1,000	10	12	100	16	2	$11,232	111.984	11.98
2007	$1,050	10	14	100	17	2	$11,934	118.983	6.25

Question - 5 -

Question 5

The consumer price index, CPI, measures the cost of living for the average consumer by multiplying the price of each category of expenditure (Housing, food, etc) by a measure of importance of that expenditure in the average consumer basket and summing over all categories.

	CPI
Housing	210.7
Food	206.3
Transportation	190.7
Medical Care	357.0
Education	121.4
Recreation	118.8

cont...

However using data from the consumer price index, we can see that changes in the cost of living for different types of consumers can vary a great deal. Let's compare the cost of living for a hypothetical retired person and hypothetical college student. Let's assume that the market basket of a retired person is allocated in the following way: 10% on housing, 15% on food, 5% on transportation, 60% on medical care, 0% on education and 10% on recreation.

The college student market basket is allocated as follows: 5% on housing, 15% on food, 20% on transportation, 0% on medical care, 40% on education and 20% on recreation. The accompanying table shows the November 2007 CPI for each of the categories:

Calculate the overall CPI for the retired person and the college student by multiplying the CPI for each category by the relative importance of that category and summing each of the categories. The CPI for all items is 210.2. How do CPI of the retired person and the college graduate compare to overall CPI?

Question 5

CPI of 210.2 overstates the cost of living for the college student and understates it for the retired person. This is because the retired person's CPI is more heavily weighted by the medical care, which is the most expensive item, while students CPI is more heavily weighted by the education.

Retired / Student	CPI	Weight	CPI Components
Housing	210.7	0.10	21.07
Food	206.3	0.15	30.945
Transportation	190.7	0.05	9.535
Medical Care	357	0.60	214.2
Education	121.4	0.00	0
Recreation	118.8	0.10	11.88
		CPI for Retired	**287.63**
Housing	211	0.05	10.535
Food	206	0.15	30.945
Transportation	191	0.20	38.14
Medical Care	357	0.00	0
Education	121	0.4	48.56
Recreation	119	0.2	23.76
		CPI for Student	**151.94**