Exercise 2

National Output and National Income

1. Is the following a stock or flow variable?

2.1 Inventories stock	2.2 Change in Inventories flow
2.3 Money Supply stock	2.4 Change in Money Supply flow
2.5 National Income flow	2.6 Expenditure flow
2.7 Wealth stock	2.8 Population stock
2.9 Capital stock	2.10 Interest flow

GDP is the value of output produced by factors of production located within a country while GNP is the value of all final goods and services produced by FoP owned by country's citizens, regardless of where the output is produced. When looking at US and China, the US has higher GNP because US almost invest abroad.

2. What is the difference between GDP and GNP? When looking at the US and China, which country do you expect to have higher GNP? Why?
3. The canned apple has 5 stages of production as follows. Find the value added of each stage and the GDP value of the canned apple.

Stages of Production	Value of Sales	Value Added
Growing Apple	12	12
Pickling	15	3
Canning	18	3
Shipping	20	2
Retail Sale	22	2

= 22 #

Transfer Payment is a payment made / income received in which no goods & services are being paid for, such as subsidy or benefit payment

4. What is Transfer Payment? Why is it not included in GDP? → Because it doesn't represent production
5. Why are we interested in Real GDP? Explain with examples. Is there a problem associated with Real GDP? To determine the rate that an economy is growing without any of distorting effects of inflation. When this number is tracked from year to year, it is seen as an important indicator of the economic health of the nation. There are some limitations of Real GDP.
6. Suppose 2018 is the base year. What can we say about Real GDP, Nominal GDP, and GDP Deflator of 2018? Real GDP = Norminal GDP so GDP Deflator will equal 1
7. Explain three limitations of the GDP concept.
   - Inequality : GDP has nothing to say about the distribution of output among individuals in a society.
   - Informal Economy : GDP does not count the unreported income generated in the hidden part of economy.
   - Externality : GDP does not take into account the costs / benefits on 3rd party, as a result of production.

8. In 2018, Kingdom Asgard made the following transactions. Using the expenditure approach, identify which component of GDP is affected by each transaction, and calculate the 2018 GDP.

- The citizens bought 8 new cars, each worth 50$. ✓
- The citizens bought 4 new houses, each worth 150$. ✓ $I = 4 \times 150 = 600$ \$
- The citizens grew rice for their own consumption. The rice was worth 500$. ×
- The firms bought 6 used machines, each worth 50$. × 2^{nd} hand ≠ GDP
- The firms bought 8 car parts, each worth 25$. × intermediate product ≠ GDP
- The government bought 4 new computers, each worth 50$. ✓ $G = 4 \times 50 = 200$ \$
- The government paid 1000$ to the poor as welfare payment. × (government spending not included) ≠ GDP
- The citizens bought 10 imported ships, each worth 100$. ✓ $M = 10 \times 100 = 1000$ \$
- The firms sold 4 planes abroad, each worth 200$. ✓ $X = 4 \times 200 = 800$ \$

9. Suppose that there are three goods in the economy – goods A, B, and C. Calculate Nominal GDP, Real GDP, and GDP Deflator when 2012 is the base year. Also, calculate the annual inflation rate from 2014 to 2015.

Year	Price of A	Quantity of A	Price of B	Quantity of B	Price of C	Quantity of C
2012	1	3	2	3	3	3
2013	3	1	4	2	1	4
2014	2	2	3	4	2	1
2015	4	4	1	1	4	2

Year	Nominal GDP	Real GDP	GDP Deflator
2012	$(1\cdot3)+(2\cdot3)+(3\cdot3) = 18$	$(1\cdot3)+(2\cdot3)+(3\cdot3) = 18$	$18/18 \times 100 = 100$
2013	$(3\cdot1)+(4\cdot2)+(1\cdot4) = 15$	$(1\cdot1)+(2\cdot2)+(3\cdot4) = 17$	$15/17 \times 100 = 88.2353$
2014	$(2\cdot2)+(3\cdot4)+(2\cdot1) = 18$	$(1\cdot2)+(2\cdot4)+(3\cdot1) = 13$	$18/13 \times 100 = 138.46$
2015	$(4\cdot4)+(1\cdot1)+(4\cdot2) = 25$	$(1\cdot4)+(2\cdot1)+(3\cdot2) = 12$	$25/12 \times 100 = 208.33$

the annual inflation rate from 2014 to 2015 $= \frac{(208.33 - 138.46)}{138.46} \approx 0.505$

$\approx 50.5\%$

$GNP = GDP + NFFI$

$= 8000 + 250 - 300 = 7950$ #

10. **Using the table below, calculate GNP and NNP.**

$NNP = GNP - \text{Depreciation}$

$= 7950 - 900 = 7050$ #

	Billions of Dollars
GDP	8000
Receipts of factor income from the rest of the world	250
Payments of factor income to the rest of the world	300
Depreciation	900
Indirect taxes minus subsidies	500
Corporate profits minus dividends	500
Social insurance payments	700
Personal interest income received from the government and consumers	300
Transfer payments to persons	1100
Personal taxes	1000

11. **Using the table below, Calculate the following items.**

11.1 Gross domestic investment $= \text{Net Investment} + \text{Depreciation} = 784 + 168 = 952$

11.2 GDP, using the expenditure approach $GDP = C + I + G + X - M$

$= 2203.2 + 952 + 716.8 + 212.8 - 235.2 = 3849.6$

11.3 GNP $= GDP + NFFI = 3849.6 + 35.2 - 68.8 = 3816$

11.4 NNP $= GNP - \text{Depreciation} = 3816 - 168 = 3648$

11.3 National Income, using the income approach $NI = W + I + R + P + (\text{tax} - \text{subsidies})$

$= 1407.7 + 182.2 + 257.6 + (173.9 + 34.1) + (593.6 - 44.8)$

$= 2604.3$

(Do not worry if NNP and NI differ greatly.)

Table 6.5

Depreciation	168.0
Compensation of employees	1,407.7
Corporate profits	257.6
Dividends	78.4
Exports	212.8
Government purchases	716.8
Imports	235.2
Indirect taxes	593.6
Net interest income	182.2
Net private domestic investment	784.0
Personal consumption expenditures	2,203.2
Personal interest income	112.0
Receipts of factor income from the rest of the world	35.2
Personal taxes	627.2
Proprietor's income	173.9
Payments of factor income to the rest of the world	68.8
Rental income	34.1
Social insurance payments	380.8
Subsidies	44.8
Transfer payments	504.0

12. In a simple economy, suppose that <u>all income is either compensation of employees or profits</u>. Suppose also that there are no indirect taxes. Calculate GDP from the table below. Show that the expenditure approach and the income approach add up to the same figure.

(Hints: (1) NNP + Depreciation = GNP, (2) NFFI = 0, and (3) NI = NNP)

Consumption	9500
Investment	3000
Depreciation	1750
Profits	2400
Exports	850
Compensation of employees	11500
Government purchases	3200
Direct taxes	1200
Saving	1600
Imports	900

Expenditure Approach

$GDP = C + I + G + (X - M)$

$= 9500 + 3000 + 3200 + (850 - 900)$

$= 15,650$ #

Income Approach

$NI = 11500 + 2400 = 13900 = NNP$

$GNP = NNP + \text{Depreciation}$

$= 13900 + 1750 = 15650$

$GDP = GNP - NFFI$

$= 15650 - 0 = 15650$ #