Johns Hopkins University
Department of Economics
Econ 180.101.11

Name: _____

Due Date: June 14
Summer 2019

Problem Set 2

Problem sets submitted after 9 am will not be graded.

Section I (10 points)

Fill in the blanks below.

1. _____ is the speed with which the overall price level is changing.

2. Germany experienced a period of _____ in 1918-1923. In the Great Depression, the US experienced a period of _____. Most economists agree that both are destabilizing.

3. Core inflation excludes _____ and _____ from the underlying basket of goods.

4. Inflation in the last decade has been _____ than it was in the late 70s/early 80s.

5. _____ is the sum of the money value of the final output of all goods and services in the domestic economy over a period of time.

6. _____ Percentage of the working-age population that state themselves as employed or unemployed but looking for a job.

7. _____ The growth rate that the economy can sustain over the 'long haul'.

8. _____ A political economist who linked 'creative destruction' to periods of economic decline.

Section II: GDP (25 points)

Consider the following quarterly data flow for the country of Citrustan:

Quantities are in millions of fruits

	Oranges		**Lemons**		**Grapefruit**	
	Quantity	Price	Quantity	Price	Quantity	Price
2015:Q2	500	1.1	200	0.7	600	2.1
2015:Q3	550	1.05	210	0.7	600	2.2
2015:Q4	250	1.2	90	0.9	340	3.2
2016:Q1	220	1.2	95	0.84	320	2.9
2016:Q2	520	1.1	210	0.72	640	2.15
2016:Q3	570	1.08	220	0.74	650	2.25

1. **(3 points)** Calculate the quarterly nominal GDP for Citrustan in 2015:Q2

2. **(3 points)** Calculate the annualized nominal GDP for Citrustan for 2016:Q2

3. Using 2015:Q2 as the base year, calculate Citrustan's real quarterly GDP
    a. **(3 points)** For 2015:Q2

    b. **(3 points)** For 2016:Q2

    c. **(3 points)** For 2015:Q4

4. Calculate the annualized real GDP growth rate. Show work.
    a. **(3 points)** 2015:Q2 to 2016:Q2

    b. **(3 points)** 2015:Q2 to 2015:Q4

5. **(4 points)** Economists often annualize growth rates to be able to compare rates of growth over different time periods. Why, in this particular case, might the annualized growth rate from 2015:Q2 to 2015:Q4 be misleading?

Section III: Long Term Sustainable Growth (21 points)

Consider the following table:

GDP per capita (constant dollars)

	USA	**India**
1985	32,300	470
1995	38,680	650
2005	48,760	1,010
2015	51,490	1,810

1. **(9 points)** Fill in the table below.

Annualized growth rate

	USA	**India**
1985 to 1995		
1995 to 2005		
2005 to 2015		

2. **(3 points)** Output per person is close to output per hour. What do we call output per hour?

3. **(3 points)** What are the three components that determine long run growth?

4. **(2 points)** Which of these three components likely explain the differential growth rates between USA, China and India over the past 30 years?

5. **(4 points)** Suppose all the nations embrace strong growth as their goal and all three make intelligent decisions over the next 20 years. Which of the three nations is likely to witness the slowest GDP/capita growth and which is likely to achieve the fastest GDP/capita growth? Briefly explain why.

Section IV (25 points)

In late 2019, Lola has $100 that she wants to save for two years. She decides she will investigate lending to the U.S. government, versus lending to different kinds of U.S. companies. She thinks inflation will average 1.5% over the next several years. She finds a financial website that provides the yields she can receive on various U.S. Treasury notes. She focuses on Treasury securities of duration 1-year and 2-years, about to be issued. These two securities appear on her screen:

U.S. T-Note, issue date 1/05/20, repayment date 01/05/21, price $100, yield 1.0%
U.S. T-Note, issue date 1/05/20, repayment date 01/05/22, price $100, yield 1.5%

Note: Remember that yield refers to the *annual* interest rate on the T-note.

1. **(4 points)** What does Lola believe the ex-ante real yield is on the 2-year note? Show your work.

2. **(4 points)** Suppose inflation averages 2% over the next two years. What was the ex-post real yield on the 2-year note? Show your work.

3. **(5 points)** What do market participants, on average, expect the 1-year yield will be in 2021? (Hint: Since there should be no *arbitrage* opportunities between investing in a 1-year security twice and investing in a 2-year security once, market participants must expect both securities to have the same return over the same period of time.) Show your work.

4. **(5 points)** If inflation turned out to be 3% in 2020, would you expect that the government would have to offer a higher or lower interest rate to borrow money for 1-year, in 2021? And if Lola bought the 2-year note, at a price of $100, and went to sell it in 2021, would the payment she collected likely be higher or lower than $100? Briefly explain.

Lola now looks at a website that provides information about the characteristics of a number of corporate bonds:

IBM note, issue date 1/05/20, repayment date 1/05/22, price $100, yield 2.5%
SnorX note, issue date 1/05/20, repayment date 1/05/22, price $100, yield 5.5%

5. **(4 points)** Explain why SnorX must pay a higher rate than IBM, to borrow for 2 years and why both SnorX and IBM pay more than the government to borrow money over the same period.

6. **(3 points)** Suppose a trade war erupts between China, Europe and the USA. Suppose further that this looks likely to badly hurt economies around the globe.

    a. The price of the 2-year T-note likely (circle 1 answer)
    Goes Up Goes Down

b. The price of the 2-year IBM note likely (circle 1 answer)
Goes Up Goes Down Goes Down a Lot

c. The price of the 2-year SnorX note likely (circle 1 answer)
Goes Up Goes Down Goes Down a Lot

Section V: Inflation (15 points)

Below is a table with the weights used by different items in the August 2018 CPI report.

Categories	**Weights**
Food	13%
Energy	8%
Core Goods (exc. Food and Energy)	20%
Core Services	35%
Owner's Equivalent Rent	24%

1. **(3 points)** The index can be slow to add new goods, particularly technological advancements such as new smart phones or laptops. If the price of these goods tends to fall over time (relative to other goods), would tardiness in including them in the index tend to overstate or understate CPI inflation?

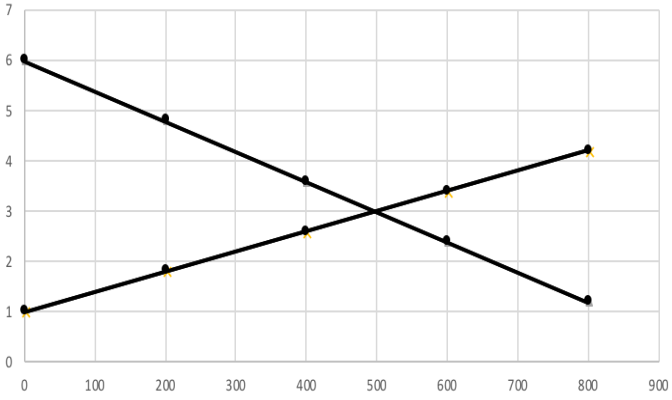
2. **(4 points)** Which of the above categories is most likely to be affected by imports of Chinese goods? If Chinese goods are becoming cheaper over time, how would that affect CPI inflation?

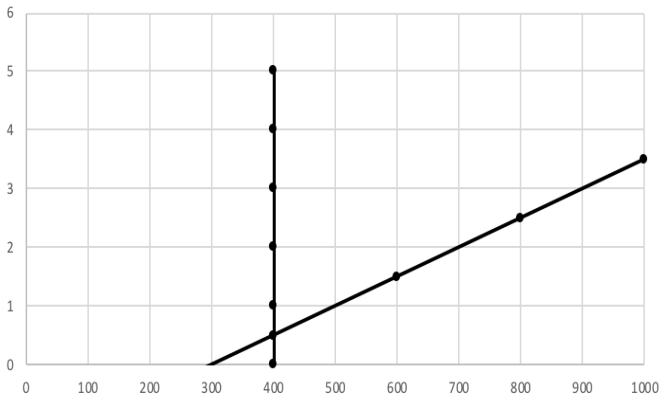
3. **(4 points)** The CPI tracks rent prices more closely than housing prices. In the Great Recession, home prices fell by about 20 percent, but rents actually increased in that period. Would inflation have been lower or higher during the Great Recession if it had tracked home prices rather than rent?

4. **(4 points)** Suppose oil prices fall by 20% due to higher supply of oil shale. In contrast, during the same time, core service prices increase by 20%. Would overall CPI inflation increase or decrease? Briefly explain why.

Section VI (32 points)

The charts below depict lending and borrowing for the U.S. economy in late 2017:





1. **(4 points)** Label the curves and identify, on the graph, the equilibrium real corporate borrowing rate and the equilibrium quantity of lending to U.S. corporations. Likewise, identify the equilibrium quantity of borrowing by the U.S. government and the equilibrium interest rate that households receive.

2. **(2 points)** What is the spread between the two equilibrium rates? Show your work.

Suppose the government enacts a very large increase in government spending, with small tax increases on the wealthy. The U.S. government, in 2018, needs to borrow 50% more than they did in 2017. In 2017, inflation is 1.5%. In 2018, inflation is 2%.

3. **(4 points)** In the government quadrant, adjust the picture to represent the change in government policy. Identify the new equilibrium interest rate and the new equilibrium level of lending to the government.

4. **(5 points)** We now have a new equilibrium in loanable funds market for the government. Suppose that in the short-run, the available sources of loanable funds are fixed in the economy, how will that affect the loanable funds market for corporations?

5. **(4 points)** Draw the change you expect to see in the corporate loanable funds market.

6. **(5 points)** If nothing else changes, will corporations be investing and borrowing more or less? What do economists call this change in private investment, in reaction to a change in government borrowing?

7. **(4 points)** Suppose increased government spending bolsters corporation's confidence. Suppose businesses sense a stronger recovery from low growth rate, because of the increase in government spending. Suppose this lifts corporate spirits and companies ramp up investment, so that their investment and borrowing are higher in 2018, than they were in 2017. Draw the necessary additional shift, so that your chart depicts both effects.

8. **(4 points)** Suppose you looked on a financial website in 2017 and again in 2018. What would the interest rate be that the government paid, to borrow money from households in 2017 and 2018? Show your work.