**Economics of Money and Banking 2021**

**Problem set n° 1**

1. Consider the model as discussed in class where all is the same except that

$$U(c\_{1t},c\_{2t+1})=2\sqrt{c\_{1t}}\_{}+\frac{c\_{2t+1}}{1+θ} $$

Find the optimum level of consumption in the two periods as well as money and equilibrium price behaviour

1. Consider again the model in (i), now with an increasing money supply, which at each date $t=1,2,..$is given by $H\_{t+1}=H\_{t}(1+h)$ where $h>0$ is the growth rate of money supply. Find the equilibrium price and consumption level.
2. (Chapt 1 textbook) Suppose the aggregate demand function in France is $p\_{f}=a-bY\_{f}$, where $a,b>0$, $p\_{f}$ is the price index in France and $Y\_{f}$ the French GDP. Moreover, suppose $p\_{f}=c+dY\_{f}$, with $a>c$, is the aggregate supply function in France. Suppose there is a negative demand shock the demand function now becomes $p\_{f}=a'-bY\_{f}$, with $a>a^{'}>c. $If $d$ remains constant, how should the coefficient $c$ change to re-establish the GDP of the initial equlibrium?
3. (Chapt 3 textbook) Consider a profit maximizing firm, selling one good in a perfectly competitive market, with the following marginal cost function

$$MC\left(y\right)=14-4y+y^{2}$$

Where $y$ is the level of production. Moreover, consider two consecutive time periods and compute its total (over the two periods) profit when

1. The product price is the same over the two periods and equal to $p=12$
2. The product price is $p=13$ in one period and $p=11$ in the other period.

Which of the two is the largest?

1. (Chapt 3 textbook)

Consider the Phillips Curve $u=u\_{n}+α(\dot{p^{e}-\dot{p})} $and suppose the monetary authority has the following Loss function over $u$ and $\dot{p}$; $L\left(u,\dot{p}\right)=\frac{\dot{p}^{2}}{2}+\frac{βU^{2}}{2}$. The authority wishes to minimize the Loss (which corresponds to maximizing its utility), with respect to unemployment rate and inflation. Based on the argument at pag 42 of the textbook, what is the level of $u\_{n}$?