# EC1410-Spring 2022
# Problem Set 6

*(Updated 20 January 2022)*

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When you write up your answers, your goals should be to (1) be correct, and (2) convince your reader that your answer is correct. It is always helpful if your work is legible and if all steps are presented, possibly with a line of explanation. Answers that do not achieve these goals will not be awarded full credit.

*Problems*

1. Are Amenities Good or Bad?

   See illustrations.

2. This problem asks you to let $U(c,l_c,A) = \overline{u}$. Assume the household problem is given by

$$\max_{c,l_c} U(c, l_c, A) = Ac^{2/3}l_c^{1/3} \text{ such that } w = c + rl_c$$

   (a) Solve the constraint for $c$. Plug your expression for $c$ into the utility function.

   (b) Solve the maximum problem for $l_c$.

   (c) Find the indirect utility function $V(w,r,A)$ by substituting demand for housing and consumption into $U(c,l_c,A)$.

   (d) Define an indifference curve by $V(w,r,A) = \overline{u}$. Solve for $r$ in terms of $A, \overline{u}$, and $w$.

   (e) Evaluate $\frac{\partial r}{\partial w}$. What is the sign of this derivative?

   Is "A" an amenity or disamenity from the perspective of the consumer? Explain briefly.

3. This problem asks you to calculate the importance of amenity A in real terms. Assume you have data on rents, wages, and amenity $A$ for a cross-section of cities. That is, your data is $\{r_i, w_i, A_i\}$ for a set of cities $i = 1, ..., J$. You may also assume that housing expenditure is one-third of the city wage. Describe the regressions you would run, and any subsequent analysis you would do, to determine the importance of amenity $A$ in real terms (that is, as a share of the city wage).