Problem set, Micro 3. Week 12: Public goods

1. Make sure you understand the examples on pages 419-20 and 423.

2. Exercise 23.4 in Varian.

3. Consider an economy with two individuals, $A$ and $B$. They have utility functions

$$U_A(x_A, G) = x_A^{1/4}G^{3/4}$$
$$U_B(x_B, G) = x_B^{1/2}G^{1/2}$$

where $g_A + g_B = G$. They have incomes $w_A$ and $w_B$ and the price of public goods is $p_G = 2$.

(a) State $A$ and $B$’s maximization problems, the first order conditions and find their reaction functions (i.e. $g_A$ as a function of $g_B$ and vice versa).

(b) Find $g_A$, $g_B$ and $G$ in Nash-equilibrium, as functions of $w_A$ and $w_B$. Insert $w_A = 5$ and $w_B = 15$ and compute the resulting contributions and the public good level provided.

(c) Change the income distribution such that $w_A = 4$ and $w_B = 16$. Recompute $g_A$, $g_B$ and $G$. Comment!

(d) Change, again, the income distribution to be $w_A = 2$ and $w_B = 18$. Recompute $g_A$, $g_B$ and $G$. Comment! Which income distribution does $A$ prefer? Which does $B$ prefer?