

My solution:

1. The result shows in the table:

Person	Y0	Y1	TE	D	Y
Adam	10	10	0	0	10
Billy	15	15	0	0	15
Cynthia	10	12	2	1	12
Daniel	8	11	3	1	11
Elaine	6	9	3	1	9
Francis	15	11	-4	0	15
Gia	5	7	2	1	7
Hank	13	11	-2	0	13
Ida	15	6	-9	0	15
Jane	11	9	-2	0	11
Kelly	10	13	3	1	13
Leanna	15	15	0	0	15

2. In the table, I denote those friends with $D=0$ and $D=1$.
3. Those people with positive TE ($D=1$) are going to play. The proportion is $\pi \approx 0.416666667$.
4. $Y = D \cdot Y1 + (1-D) \cdot Y0$

Using this equation, I get the Y column in the table.

5. a. $E[Y|D=1] = 10.4$
 $E[Y|D=0] = 13.42857143$
Simple difference in mean outcomes:
 $E[Y|D=1] - E[Y|D=0] = 10.4 - 13.42857143 = -3.028571429$
b. $ATE = -0.333333333$
 $ATT = 2.6$
 $ATU = -2.428571429$
c. $E[Y0|D=1] = 7.8$
 $E[Y0|D=0] = 13.42857143$
Selection bias:
 $E[Y0|D=1] - E[Y0|D=0] = 7.8 - 13.42857143 = -5.628571429$
d. SDO decomposition:
 $ATE + \text{Selection bias} + (1-\pi)(ATT - ATU)$
 $= -0.333333333 + (-5.628571429) + (1 - 0.416666667)[2.6 - (-2.428571429)]$
 $= -3.028571429$