1 Description of Main Files

- Notes:
  - In all codes, the variable A1 and A2 correspond to D_1 and D_2, respectively, of the paper
  - Only main functions are described here; there are other functions used to run the codes but not described

1.1 Simulation

- CollectBds_pop.m: Main code to compute bounds and DAGs with population p (i.e., true p)
  - This code produces Figures 1–6 in the supplemental appendix of the paper
- CollectBds_sample.m: Main code to compute bounds and DAGs with estimated p (i.e., $\hat{p}$)
  - This code produces the estimated versions of Figures 1–6 above (the results are not shown)
- Main functions:
  - bds_M1.m: Default function to compute bounds under Assumption M1
  - bds_M2.m: Default function to compute bounds under Assumption M2
  - bds_M2_neg.m: bds_M2.m but when D_2 affects Y_2 negatively
    - Note: In practice, the sign of the treatment effect is unknown but can be estimated by the auxiliary quantity h; this is done in the application (see the last part of "CollectBds_jtpa.m")
  - bds_M1_Z1.m: bds_M1.m but only using Z_1
  - bds_M2_Z1.m: bds_M2.m but only using Z_1

1.2 Application

- jtpa_han.tab: The data set constructed for the application; see the paper for the details of the data sources
  - Variables appearing in the data set:
    - D2: The indicator whether received job traininig ($D_2 = 1$ if received, $= 0$ if not)
    - Z2: The indicator whether job traininig was assigned ($Z_2 = 1$ if assigned, $= 0$ if not)

- earnings: 30-month earnings after the job training program
  - $Y_2 = 1\{\text{earnings} \geq \text{median}\}$
- prevearn: Pre-program earnings
  - $Y_1 = 1\{\text{prevearn} \geq 80\text{th percentile}\}$
- educ: Years of education
  - $D_1 = 1\{\text{educ} \geq 12\}$ is the indicator of high school diploma
- n_hs2: Number of high schools per square mile
- n_hs2_abv: $Z_1 = 1\{\text{n\_hs2} \geq 35\}$
- sex: $X = 1$ if male, $= 0$ if female

- CollectBds_jtpa.m: Main code to compute bounds and DAGs with estimated p using the data set
  - This code produces Figures 2–3 in the main paper
- Main functions:
  - bds_M2_jtpa.m: Default function to compute bounds under Assumption M2 for welfare $E[Y_2(\boldsymbol{\delta}(\cdot))]$
  - bds_M2_jtpa_wel2.m: bds_M2_jtpa.m but for welfare $E[Y_1(\delta_1)] + E[Y_2(\boldsymbol{\delta}(\cdot))]$
  - bds_M2_jtpa_Z2.m: bds_M2_jtpa.m but only using Z_2
  - bds_M2_jtpa_wel2_Z2.m: bds_M2_jtpa_wel2.m but only using Z_2