

## Computation Environment Setup

- Serial
- Single node with multiple cores
- Multiple nodes with multiple scores

## Data Integration

- Genotype
- Genotype annotation
- Longitudinal trait
- Covariate

## Ad-Hoc QC for genotype data

- Missing rate
- Monomorphic site
- Set with not enough SNPs

GEE Fitting longitudinal data under  $H_0$  to derive score vector and variance-covariance matrix

(optional) Permutation Procedure to obtain null distribution of score vector for LaSPU

## Execute Five Tests (default):

- Sum Test
- SSU(w) Tests
- UminP Test
- Score Test
- LaSPU