

### GENE (entity)

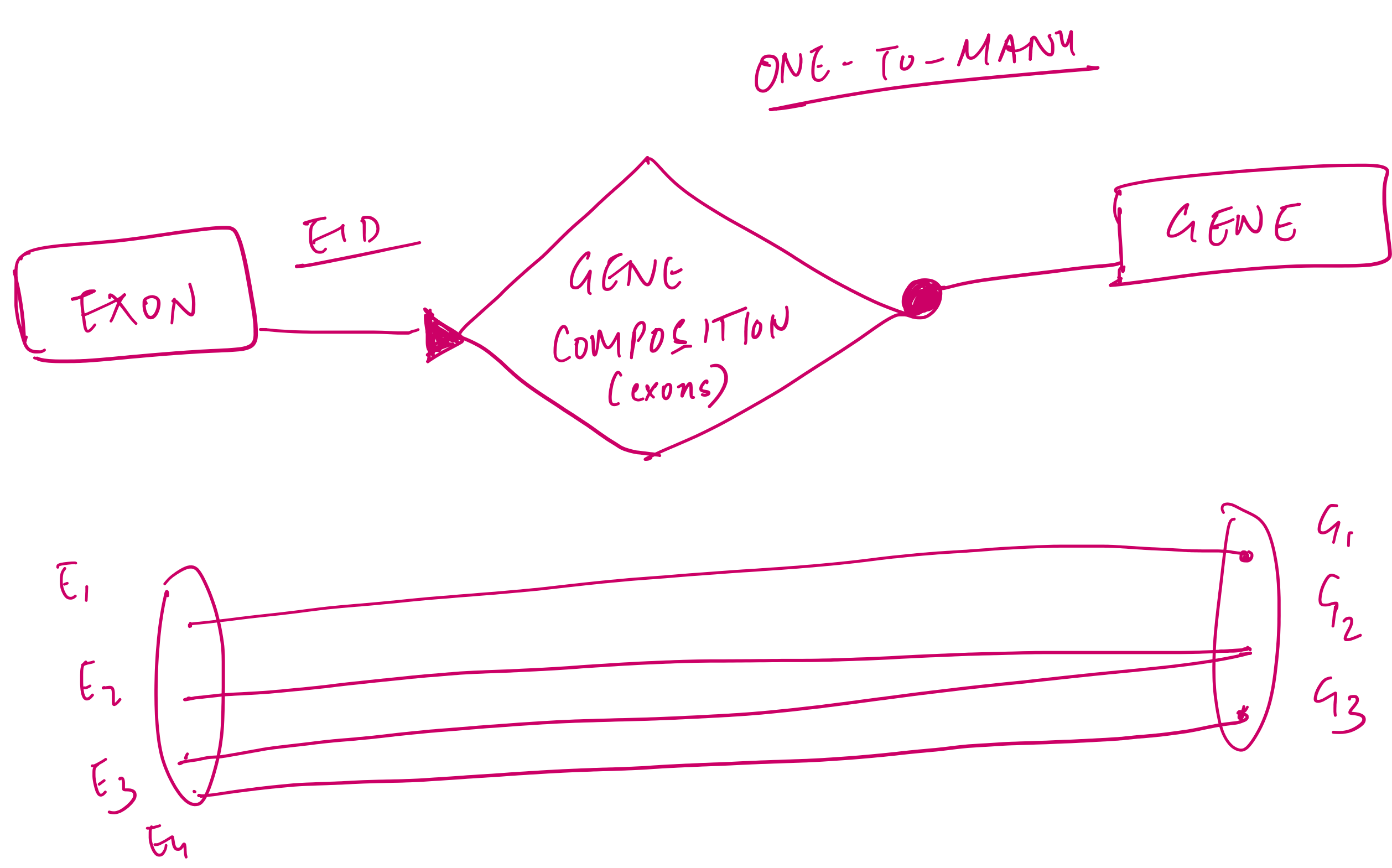
- CHROM. NUMBER
- ORGANISM
- NAME
- START POSITION
- END POSITION
- ID (GID)

### EXON (entity)

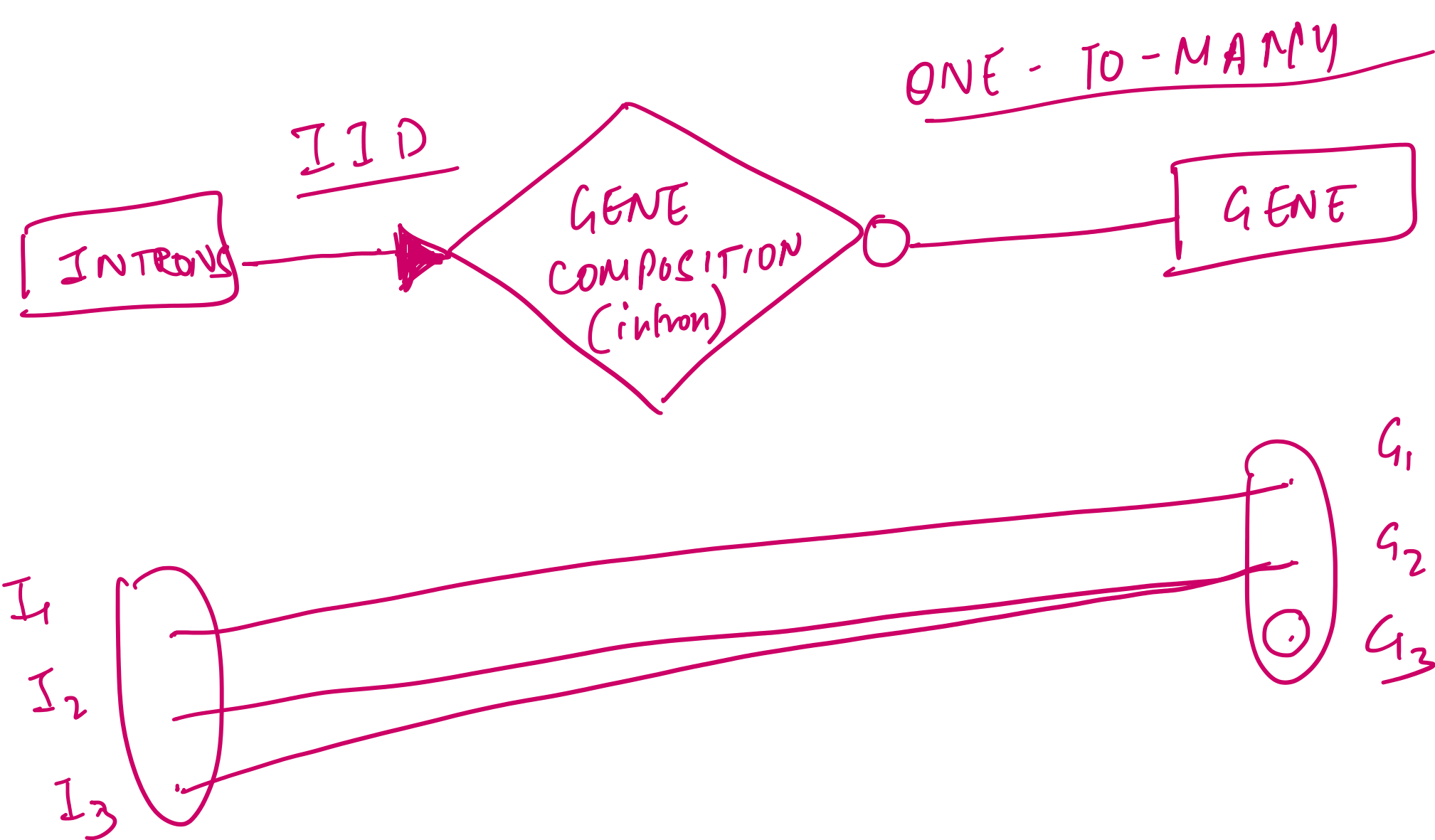
- NUMBER
- START POSITION
- STOP POSITION
- ID (EID)

### INTRON (entity)

- NUMBER
- START POSITION
- STOP POSITION
- ID (IID)



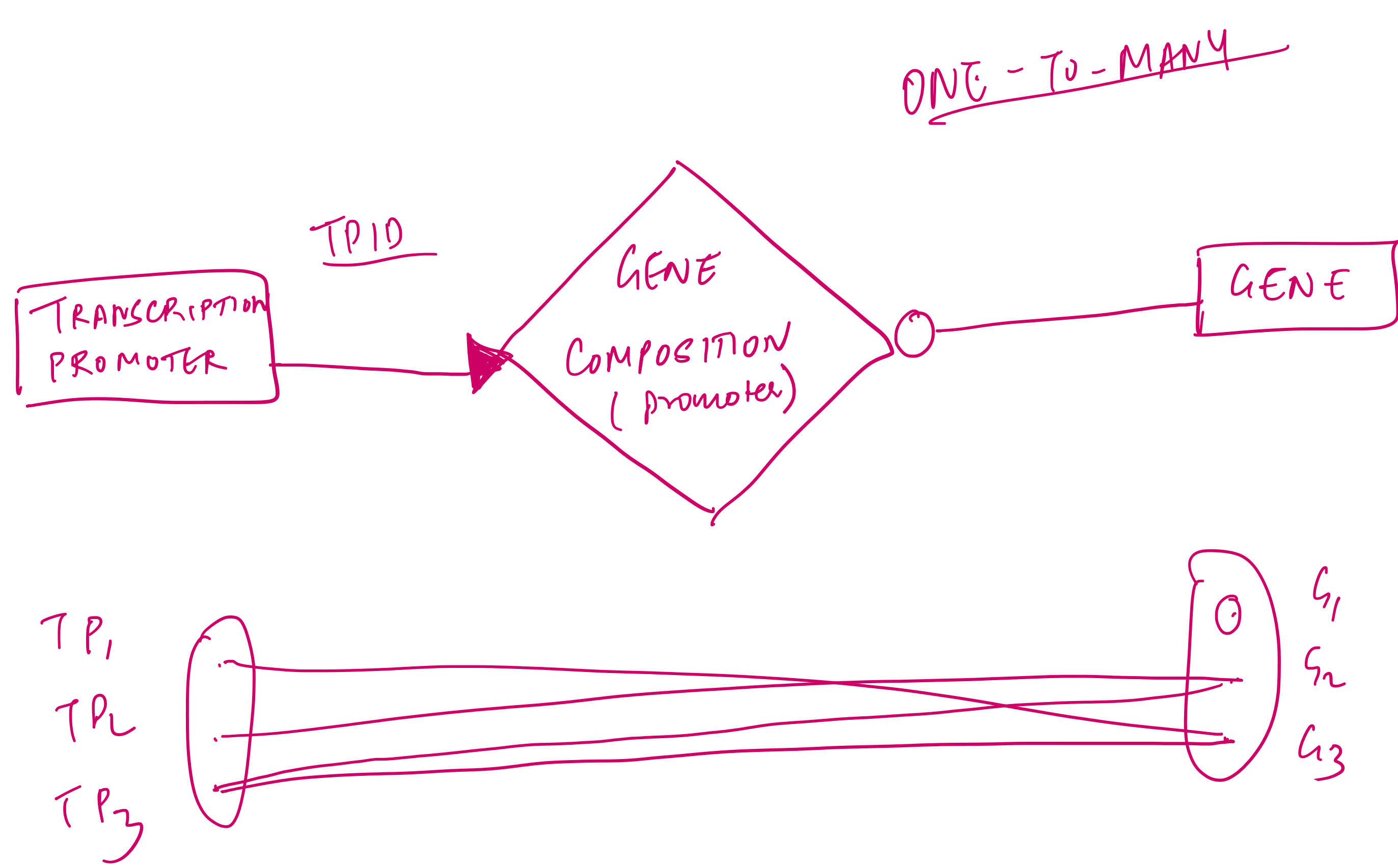
A gene has at least one exon  
 An exon cannot be shared by 2 genes



An intron cannot be shared by 2 genes  
 Not all genes need to have introns  
 (partial participation)

### TRANSCRIPTION PROMOTER ELEMENT (entity)

- NAME
- TYPE
- ID (TPID)



A transcription promoter element cannot exist without a gene,  
 and can be associated with more than one gene

A gene need not always have a promoter element  
 (partial participation)

### EXPERIMENT (entity)

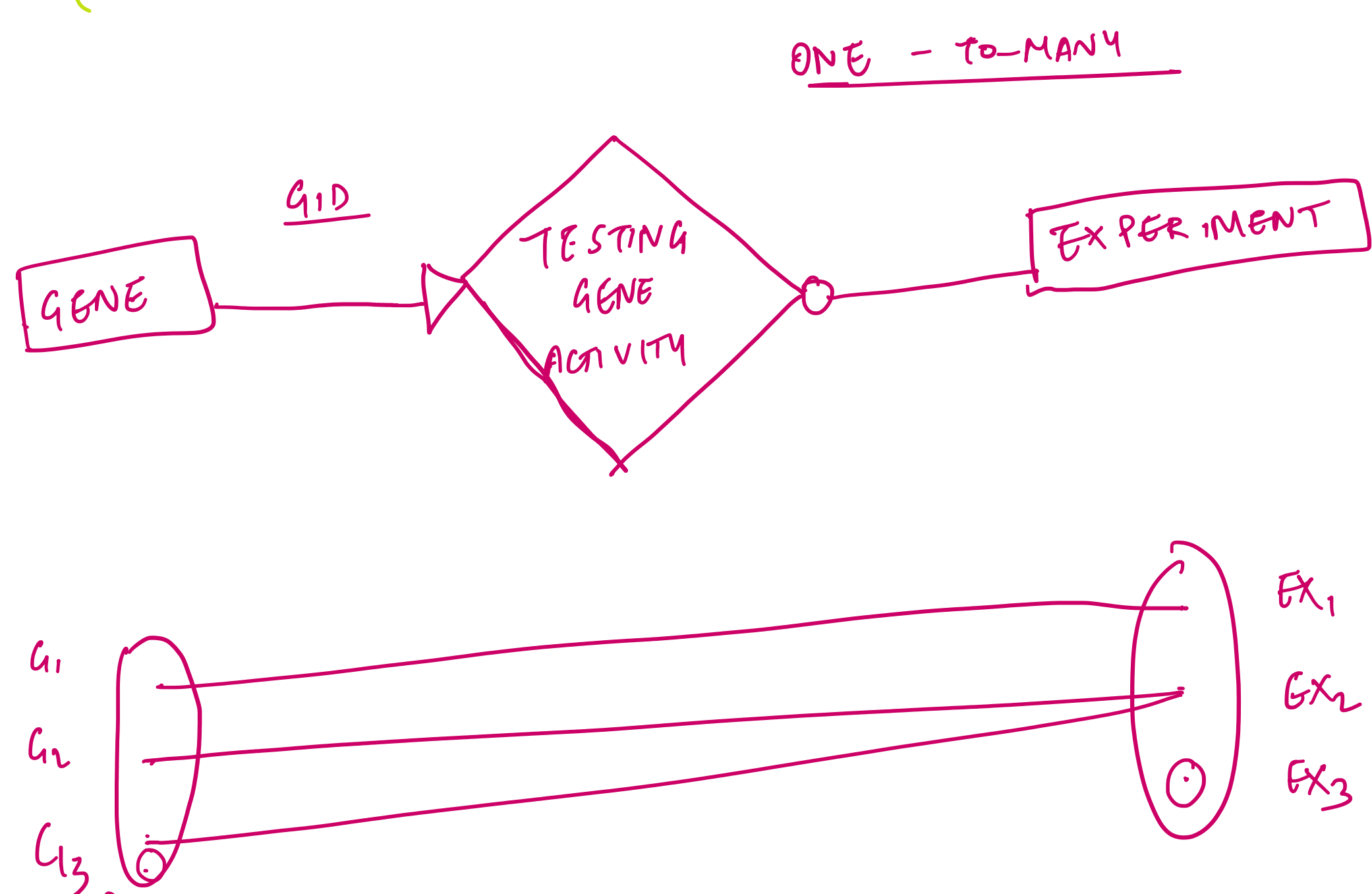
- LAB
- DATE
- GENE ACTIVITY
- ID (ExpID)

### STUDENT (entity)

- NAME
- ID (SID)

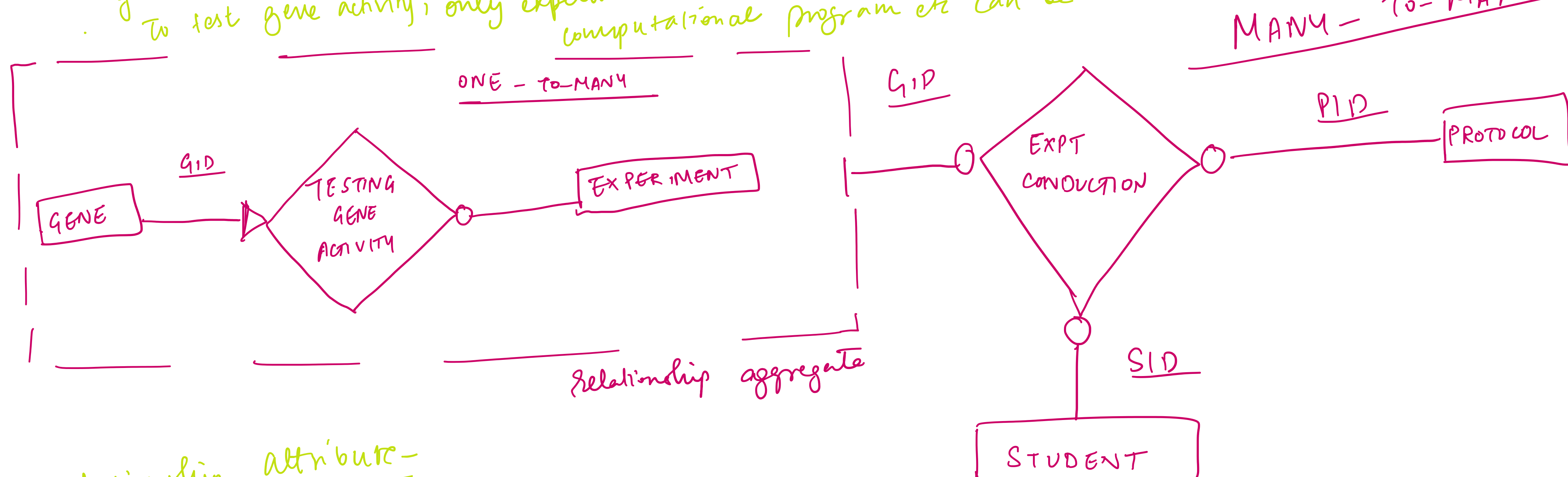
### PROTOCOL (entity)

- EXPERIMENTAL CONDITIONS
- ID (PID)

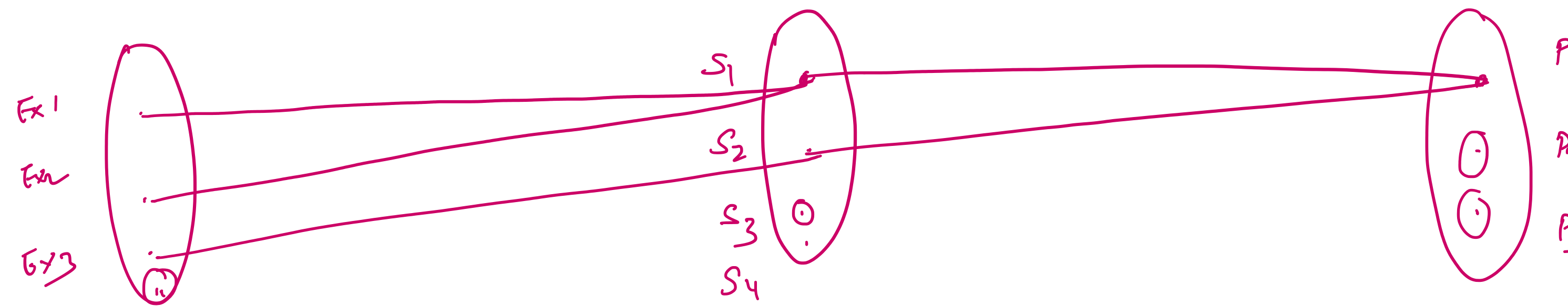


#### Assumption -

- Not every gene's activity has been tested by experiments
- Not every experiment tests gene activity. They can be other experiments too. But when they do, they involve one or more genes
- To test gene activity, only experiments are allowed. No computational program etc can be used.



relationship attribute -  
 day/date of running the expt  
 unary relationship



#### Assumptions -

- Not all students have to conduct experiments to test gene activity (or even regular "non-" gene activity experiments) (partial participation)
- One experiment cannot be run by 2 or more students together. It can only be rerun on a day different from the initial run by the same or another student.
- A student can only use one protocol for one experiment.
- One protocol can be used for different experiments.
- Not all experiments have to be conducted by students. They can also be conducted by professors or researchers.