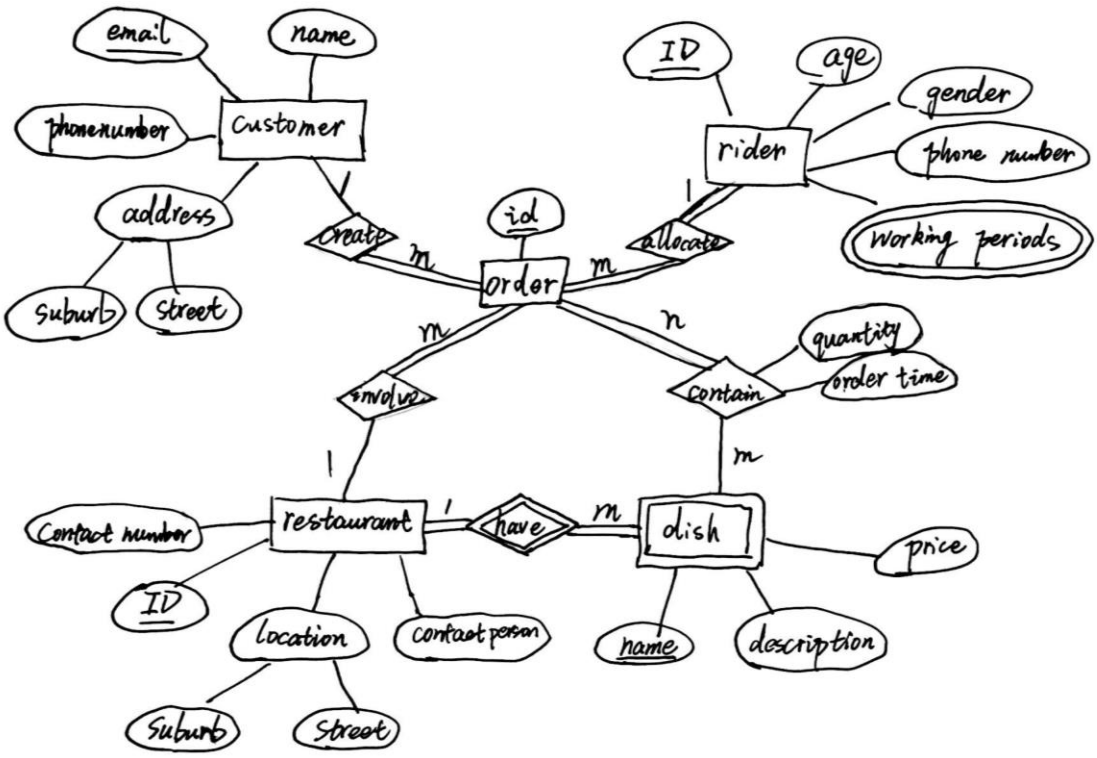
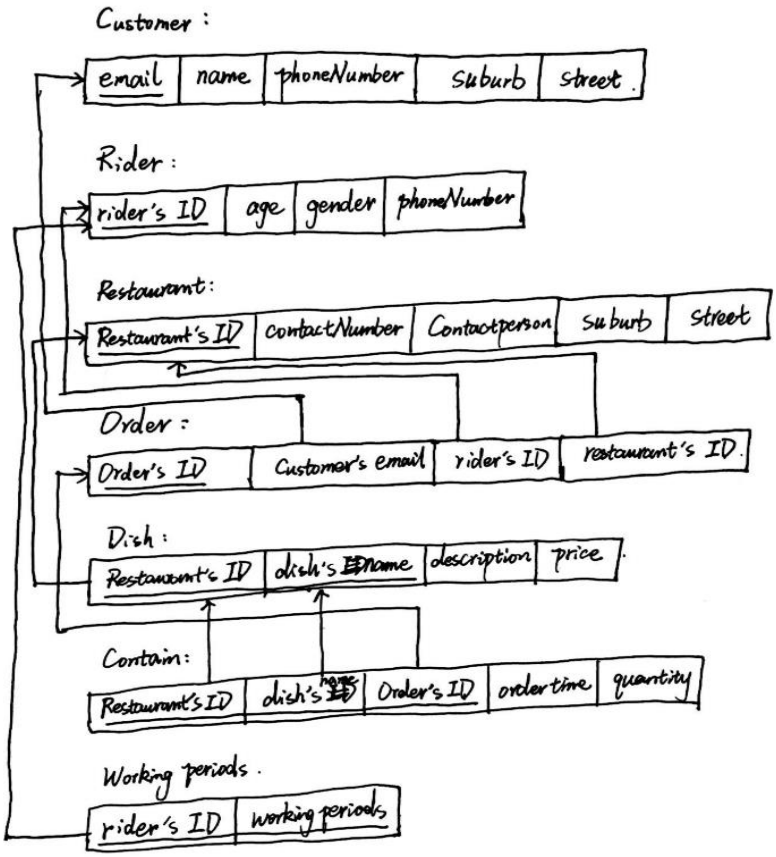
Question1 & Question2:

ER – diagram:



Convert into a relational model:



Question3:

(1)$\pi_{\{title\}}(\sigma_{<name='Taylor Swif' and genre='pop'>}(Song \bowtie GenreOfSong \bowtie SongCreating \bowtie Artist))$

(2)$\pi_{\{title\}}(\sigma_{<name='Taylor Swif' or name='Ed Sheeran' >}(Song \bowtie GenreOfSong \bowtie SongCreating \bowtie Artist))$

(3)$(\pi_{\{name\}}(\sigma_{<gender='female' and Name='Universal Music Group' and genre='pop'>}(GenreOfSong \bowtie SongCreating \bowtie Artist \bowtie JoinIn \bowtie Company))) - (\pi_{\{name\}}(\sigma_{<genre='hip-pop'>}(GenreOfSong \bowtie SongCreating \bowtie Artist)))$

(4) let R1 = SongCreating$\bowtie$Artist

And R2 = SongCreating$\bowtie$Artist

$((\pi_{\{name,genre\}}(GenreOfSong \bowtie SongCreating \bowtie Artist)) \div (\pi_{\{genre\}}(GenreOfSong))) \cap (\pi_{\{R2.name\}}(\sigma_{<R1.name = 'Taylor Swift' and R2.name \neq 'Taylor Swift'>}(R1 \times R2))$