Exercise 2 - Solution

Q1

$$\pi_{\{stude\}}(\sigma_{(mark>70\ AND\ subj=1011)}(MARK))$$

Q2

$$\pi_{\{name,subj\}}(\sigma_{(mark>70)}(STUDENT \bowtie_{(sid=stude)} MARK))$$

Q3

$$\pi_{\{fisrtName,lastName\}}(author \bowtie book)$$

Q4

$$A \leftarrow \pi_{\{authorID\}}author - \pi_{\{authorID\}}book$$

$$B \leftarrow \pi_{\{firstName,lastName\}}(A \bowtie author)$$

(It's possible to have duplicate author names)

Q5

$$\pi_{\{fisrtName,lastName\}}(author \bowtie authorPub)$$

Q6

$$\pi_{\{fisrtName,lastName\}}(author \bowtie (authorPub \bowtie (\sigma_{(month='July')}(book) \bowtie pub)))$$

Q7

$$A \leftarrow \pi_{\{authorID\}}book$$

$$B \leftarrow \pi_{\{authorID\}}authorPub$$

$$C \leftarrow \pi_{\{firstName,lastName\}}((A - B) \bowtie author)$$

Q8

$$\pi_{\{name\}}((\sigma_{(gender='female')}(Student)) \bowtie Enrolment \bowtie (\sigma_{(job='designer')}(JobRequirement)))$$

Q9

$$A \leftarrow \pi_{\{name\}}(Student \bowtie (Enrolment \div \pi_{\{courseID\}}(\sigma_{(job='designer')}(JobRequirement))))$$
$$B \leftarrow \pi_{\{name\}}(Student \bowtie Enrolment \bowtie (\sigma_{(faculty='law')}(Course))))$$
$$C \leftarrow A - B$$

Q10

$$A \leftarrow \pi_{\{courseName\}}(Course \bowtie Enrolment \bowtie (\sigma_{(gender='female')}(Student)))$$
$$B \leftarrow \pi_{\{courseName\}}(Course \bowtie Enrolment \bowtie (\sigma_{(gender='male')}(Student)))$$
$$C \leftarrow (A - B) \cup (B - A)$$