

CS5/7316 Software Requirements

Homework #1

(8.5 pts)

Due Dates: On campus students due by 11:59pm on 9/19/2024
Off campus students due by 11:59pm on 9/20/2024

1. Problem World, Machine Word and Shared Phenomena (2.5 pts)

Read the Library case study on page 6-7 of the **RE** text book (section 1.1.2). Draw a world a machine diagram similar to Figure 1.1 (The problem world and the machine solution) showing where the following phenomena are located;

- BookCopyReturned (the return of a book by a patron)
- ReturnEncoded (the encoding of a returned book by a library staff at a terminal)
- LoanRecordUpdated (the corresponding database update)
- BookCopyInShelves (the physical availability of book copy in library shelves)
- BookAvailabilityDisplayed (the displaying at a terminal of a book's availability status)
- BookCoversThisTopic (the fact that a book covers such or such topic)
- BookKeywordsEncoded
- DatabaseSearched
- QueryAnswerDisplayed

2. Frame Diagrams

We discussed the importance of framing a problem in order to understand the problem better and be able to develop a solution more quickly and easily. In this homework, you are asked to use the different problem frames discussed in class to create a frame diagram for the following software systems.

- Traffic light controller; this system switches lights between red, green, and yellow according to timing rules, activity registered at sensors, and timing relationships with activity at neighboring traffic lights. (3 pts)
- A program that tells a bus rider which buses to take to get from one location to another, arriving by a specified time. (3 pts)

Keep in mind that problem frames can be combined when solving these problems.