Homework 3

**Reading:** Read Chapter 6, 7 of OOA. Start reading Part 3 (Ollie’s Order Center) of OM - pages 151-182.

**Problems:**

1. The following figure shows a portion of an object diagram for a computer system for laying out a newspaper. The system handles several pages which may contain, among other things, columns of text. The user may
   - edit the width and length of a column of the text,
   - move a column around on a page,
   - move a column from one page to another

   A column is displayed on exactly one page.

   ![Object Diagram](image)

   It is desired to modify the system so that portions of the same column appear on more than one page. If the user edits the text on one page, the edits should appear automatically on other pages.

   Modify the object diagram below to handle this enhancement. *(Hint: since a column can be spread between various pages, it must know about it’s location at all of the pages that it appears in)*

**Problem 2** Multi-system VCRs can read a video-stream that comes in any one of the specified set of formats (e.g. NTSC, PAL/SECAM, etc) and transform it to a stream in another format to be played or recorded. Uni-system VCRs can only read/output the video-stream in a single format. Identify attributes and services that are common and those that are unique for each of these classes.

Draw a diagram that models multi-system and uni-system VCRs including attributes and services of each Class&Object for a VCR programming system that implements control of the VCR by means of a computer program.
3. A simple digital watch has a display and two buttons to set it, the A button and the B button. The watch has two modes of operation, display time and set time. In the display time mode, hours and minutes are displayed, separated by a flashing colon. The set time mode has two sub modes, set hours and set minutes. The A button is used to select modes. Each time it is the mode advances in the sequence: display, set hours, set minutes, display, etc. Within the sub modes, the B button is used to advance the hours or minutes once each time it is pressed. Buttons must be released before they can generate another event.

Prepare a Object model of the watch. Identify attributes and services necessary to implement the described functionality.