Assignment Outline

The objective of this assignment is to design and implement the controller for an electronic safe where the number inputs are between 0 and 9 to allow an “X” digit number (See Table 1 for the values you should use) to be entered.

The inputs to the main system will be four key buttons and two switch inputs:

1. KEYA – Restart (Lock)

2. KEYB – Number “Up” button

3. KEYC – Number “Down” button

4. KEYD – Number “Entry” button

5. SWM – Mode Switch 6. SWX – System Reset

The outputs from the design will be:

1. RLEDX – Locked

2. GLEDX – Unlocked

3. HEXX-Y – Display of the X Digits as they are entered

The system will start by the operator pressing the “Restart” key which should lock the safe and illuminate the RLEDX led. A number between 0 and 9 will then be displayed on the seven segment displays “HEXX”. The operator can change the selected number by pressing the number up or down button until the correct digit is selected. The operator will then enter this number by pressing the “Entry” button and the system will shift the displays left to show the entered numbers, then repeat allowing the selection of the remining numbers. On selection of the final number the system should check for the correct code and if the full code has been entered correctly the Green GLEDX should be switched on and the RLEDX switched off.

Initially the entry code should be the last X digits from your student ID. However once the safe is unlocked the Mode Switch should be tested to determine whether the system is in the “programming” mode where the user can change the safe combination in a similar way to how the code is entered. On System Reset it should return to default ID Number code.