Assignment 2
Design Philosophy

RFID Reader

StartState

The initial execution of this application. In this state, the window will be created to support the program's functions and will later transition to the INACTIVE MODE. In this state, it will automatically detect the computer's readers. If the FindReader() function fails 5 times, the program will terminate.

1. CreateWindow(): Create the drawing surface on which the user will interact with for the purpose of the RFID scanner.
    a. Success: Continue to find devices
    b. Failure: Close any opened handles and terminate the program.
2. InActiveModeInit(): Initialize all required variables needed for reading.

InActive Mode

An idle state of the program It is waiting for the user to select from the menu and choose to Connect, Help, ClearScreen or Exit.

1. WaitForUserInput(): Continuous loop that receives user input and waits for them to allow the program to change to Working Mode.
    a. Success: Call the ActiveModeInit
    b. Failure: Continue loop until success.
2. ActiveModeInit(): Begins the process of switching to Active Mode by searching the current computer's devices. Success
    a. Success: Devices are connected to the computer.
    b. Failure: No devices are connected to the computer at this time.
3. FindDevices() GABRIELLA: Find all available devices connected to the computer currently.
    a. Success: Device are found, continue to the FindReader()
    b. Failure: No device found on the computer or this function was called 5 times in total. Terminate the program with WindowDestroy().
4. FindReaders(): Find all available readers from the list of device detected from the computer.
    a. Success: Reader was detected, continue to SelectReader().
    b. Failure: No readers were detected, refresh the list of devices with FindDevices() and try again.
5. Help(): The user selects the help button from the menu and a small message is displayed to the window describing the usage of the program.
6. ClearScreen(): The user selects ClearScreen from the menu and fills the page with empty space. Also clears resets the X and Y positions for displaying text.
7. EndProgram(): When the user chooses to stop the program by clicking the X button or the Exit button from the menu. Close all available handles and terminate the window. Finally exit the program.

Active Mode

An active state that has a thread running that attempts to read all RFID tags surrounding it.

1. CreateReadThread(): Create the thread where reading will take place.
    a. Success: Continue to the ReadThreadInit().
    b. Failure: Immediately close the Window to prevent memory leaks.
2. ReadThreadInit(): Initialize the thread and begin the scanning process for the RFID Tags.
3. Scan(): Scan the nearby field (up to 12 inches) for nearby RFID Tags. Uses the SkyeTek_GetTags API call.
    a. Success: Continue to ReadTagName()
    b. Failure: Continue the Scan loop.
4. ReadTagName(): Attempt to read the TagTypeName and convert it into a string.
    a. Success: Pass string to DisplayTagName().
    b. Failure: Restart scan loop, ignore read error.
5. DisplayTagName(): Read string and print it on the window. Lptags[0] = LPCWSTR
    a. Success: Return to Scan()
    b. Failure: Log error and return to Scan()
6. StopScan(): User selects the disconnect button from the menu. The read thread and all variables pertaining to the read thread are closed or set to null.
7. Help(): The user selects the help button from the menu and a small message is displayed to the window describing the usage of the program.
8. ClearScreen(): The user selects ClearScreen from the menu and fills the page with empty space. Also clears resets the X and Y positions for displaying text.
9. EndProgram(): When the user chooses to stop the program by clicking the X button or the Exit button from the menu. Close all available handles and terminate the window. Finally exit the program.