Innovative Teaching Approaches in development of Software Designed Instrumentation and its application in real-time systems

The Advanced Applications of LabVIEW

Lecture 5: Queued Message Handler

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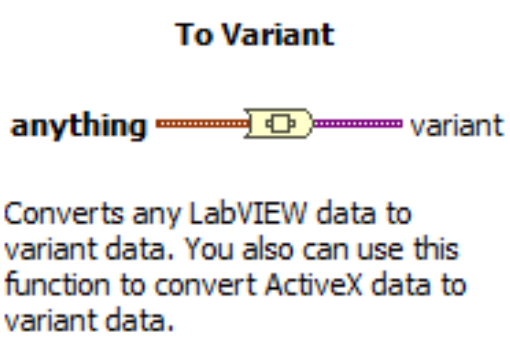
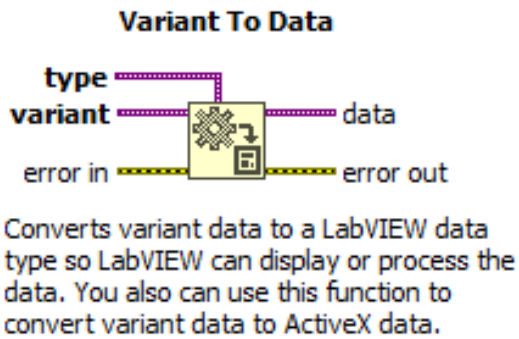
Variants

- Variant is a generic data type, which allows you to store and transfer any data types in LabVIEW.
- Variants are useful when you would like to:
  - create subVI, which can operate using different data types depending on your needs,
  - create application based on producer/consumer design pattern and you need a flexibility of data types you would like to transfer between loops.



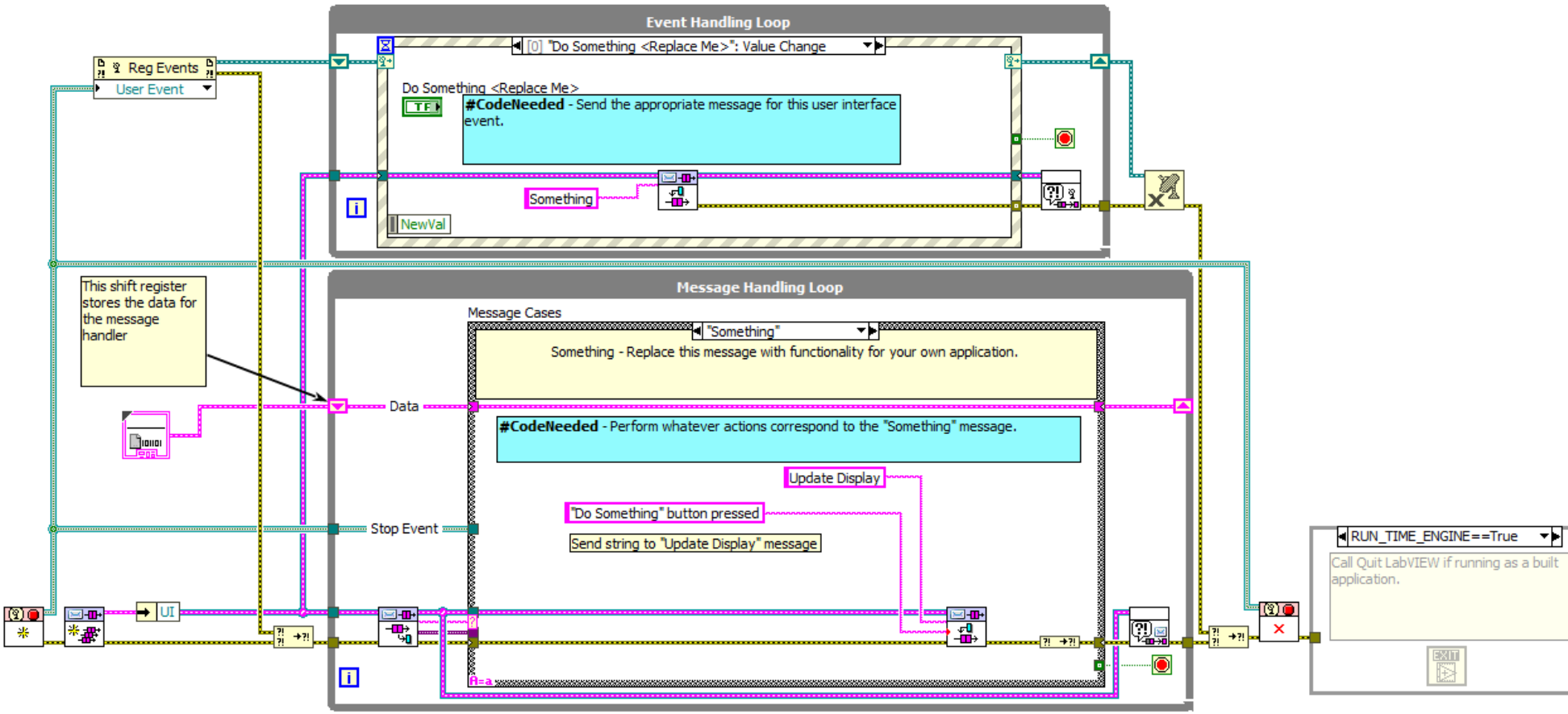


Characteristic of QMH

- The Queued Message Handler (QMH) design pattern is a modification of producer/consumer design pattern.
- In this case, the producer loop sends messages to the consumer loop. Consumer loop analyses messages and also can add new messages to the queue (sending to itself).
- In practice, it means that new elements are added to queue in producer and consumer loops.
- The QMH transfer a message and message data (optional) between loops
- THE QMH is created by choosing: ***File*** $\rightarrow$ ***Create project*** $\rightarrow$ ***Queued Message Handler***.

Component	Function	Data types
Message	to send an order to slave/consumer/message loop	String or enum
Message data	to send necessary data to slave/consumer/message loop	string or variant

Template


Event Handling Loop
[0] "Do Something <Replace Me>": Value Change
Reg Events
User Event
Do Something <Replace Me>
TF
#CodeNeeded - Send the appropriate message for this user interface event.
Something
NewVal
This shift register stores the data for the message handler
Message Handling Loop
Message Cases
"Something"
Something - Replace this message with functionality for your own application.
Data
#CodeNeeded - Perform whatever actions correspond to the "Something" message.
Update Display
"Do Something" button pressed
Stop Event
Send string to "Update Display" message
UI
RUN_TIME_ENGINE==True
Call Quit LabVIEW if running as a built application.
EXIT

Thank you for attention!

Lecture was prepared based on materials from: "LabVIEW Core 3 Course Manual".

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