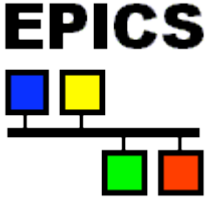

Practice
SNL and Sequencer

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Preparation

- We use **Ubuntu Linux with EPICS** in the bootable USB memory.
  - After booting Linux, To avoid record name collision, set your PC name.

    ```
    export USER=PCname
    ```

    Note: PCname: use your own PC name.
  - Then, make your application directory (`~/app2/`) and create a new application "`myExample`".

    ```
    cd
    mkdir app2
    cd app2
    makeBaseApp.pl -t example myExample
    makeBaseApp.pl -i -t example myExample
    ```
  - Edit `~/app2/configure/RELEASE`

    (If you are not familiar to Linux, use `gedit` command to invoke editor.

    ```
    #SNCSEQ=$(EPICS_BASE)/../modules/soft/seq
    ```

    ↓ remove "#" and modify the directory name

    ```
    SNCSEQ=/opt/epics/modules/soft/seq/seq-current
    ```
  - Then make

    ```
    cd ~/app2
    make
    ```

Run sample program (1)

- You can find a ready-made sample State Program "**`sncExample.stt`**" in the **`~/app2/myExampleApp/src`** directory.
- Try to run this program as follows.

Run sample program (2)

- [Step1] Edit **st.cmd**
  - Edit ~/app2/iocBoot/iocmyExample/st.cmd

```
#seq sncExample,"user=PCnameHost"
```

↓ remove "#"

```
seq sncExample,"user=PCnameHost"
```

- [Step2] Run **st.cmd** script (iocsh)

```
cd ~/app2/iocBoot/iocmyExample
chmod +x st.cmd
./st.cmd
```

seqShow, seqChanShow

- [Step3] Try to type **`seqShow`**, **`seqChanShow`** commands in the iocsh and look at the output.

```
epics> seqShow
  ...
epics> seqShow sncExample
  ...
epics> seqChanShow sncExample
  ...
```

Prepare database (1)

- [Step4] Create a database file “seqPractice**.db**” (**~/app2/myExampleApp/Db/seqPractice.db**) which contains following records.

  $(user):Vout
  - **calc** record; SCAN “.1 second”
  - CALC field is “(A<99)?(A+1):0”
  - INPA field is “**$(user):Vout**”
  - HOPR field is 100.0; LOPR field is 0.0

  $(user):IndicatorLight
  - **bo** record; SCAN “Passive”
  - ZNAM field is “LightOff”; ONAM field is “LightOn”

  $(user):Switch
  - **bi** record; SCAN “Passive”
  - ZNAM field is “OFF”; ONAM field is “ON”

Prepare database (2)

- [Step5] Make the database.
  - Edit **~/app2/myExampleApp/Db/Makefile**

```
DB += seqPractice.db
```

← add this line

  - Then make

```
cd ~/app2/myExampleApp/Db
make
```

  - Edit **~/app2/iocBoot/iocmyExample/st.cmd**

```
dbLoadRecords "db/dbSubExample.db", "user=PCnameHost"
dbLoadRecords "db/seqPractice.db", "user=PCnameHost"
```

← add this line

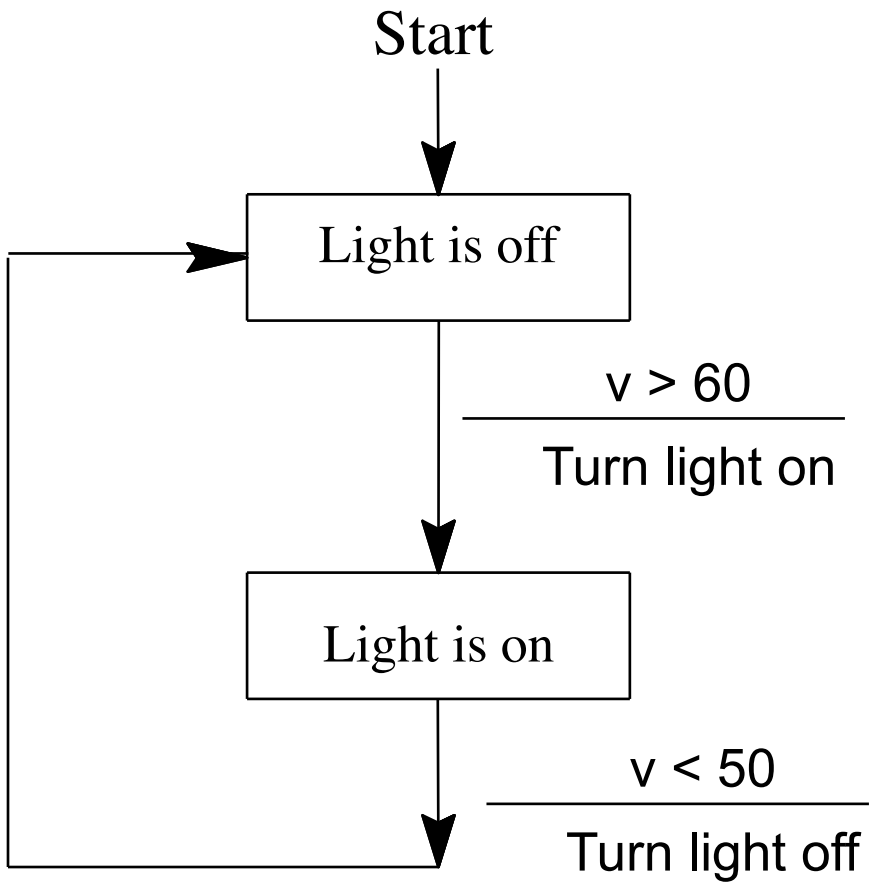
Prepare database (3)

- [Step6] Run st.cmd

- [Step7] Create a medm display that shows your records. And then …
  - Add a strip chart on your display to monitor your **`$(user):Vout`** record.
  - Try to modify SCAN field of **`$(user):Vout`** record using your display.

Create a SNL program

- [Step8] Create a SNL program "**`seqPractice.st`**".



~/app2/myExampleApp/src/seqPractice.st

```
program seqtest
float   v;
assign  v to "{user}:Vout";
monitor v;
short   light;
assign  light to "{user}:IndicatorLight";
ss volt_check
{
        state light_off
        {
                when (v > 60.0)
                {
                        /* turn light on */
                        light = TRUE;
                        pvPut(light);
                } state light_on
        }

        state light_on
        {
                when (v < 50.0)
                {
                        /* turn light off */
                        light = FALSE;
                        pvPut(light);
                } state light_off
        }
}
```

Compile the new SNL Program

- [Step9] compile and prepare to run
  - Create new file **~/app2/myExampleApp/src/seqPractice.dbd** which contains the following line.

```
registrar(seqtestRegistrar)
```

  - Edit **~/app2/myExampleApp/src/Makefile**

```
sncExample_SNCFLAGS += +r
seqPractice_SNCFLAGS += +r ← add this line
myExample_DBD += sncExample.dbd
myExample_DBD += seqPractice.dbd ← add this line
myExampleSupport_SRCS += sncExample.stt
myExampleSupport_SRCS += seqPractice.st ← add this line
```

  - Then make

```
cd ~/app2/myExampleApp/src
make
```

Execute SNL Program

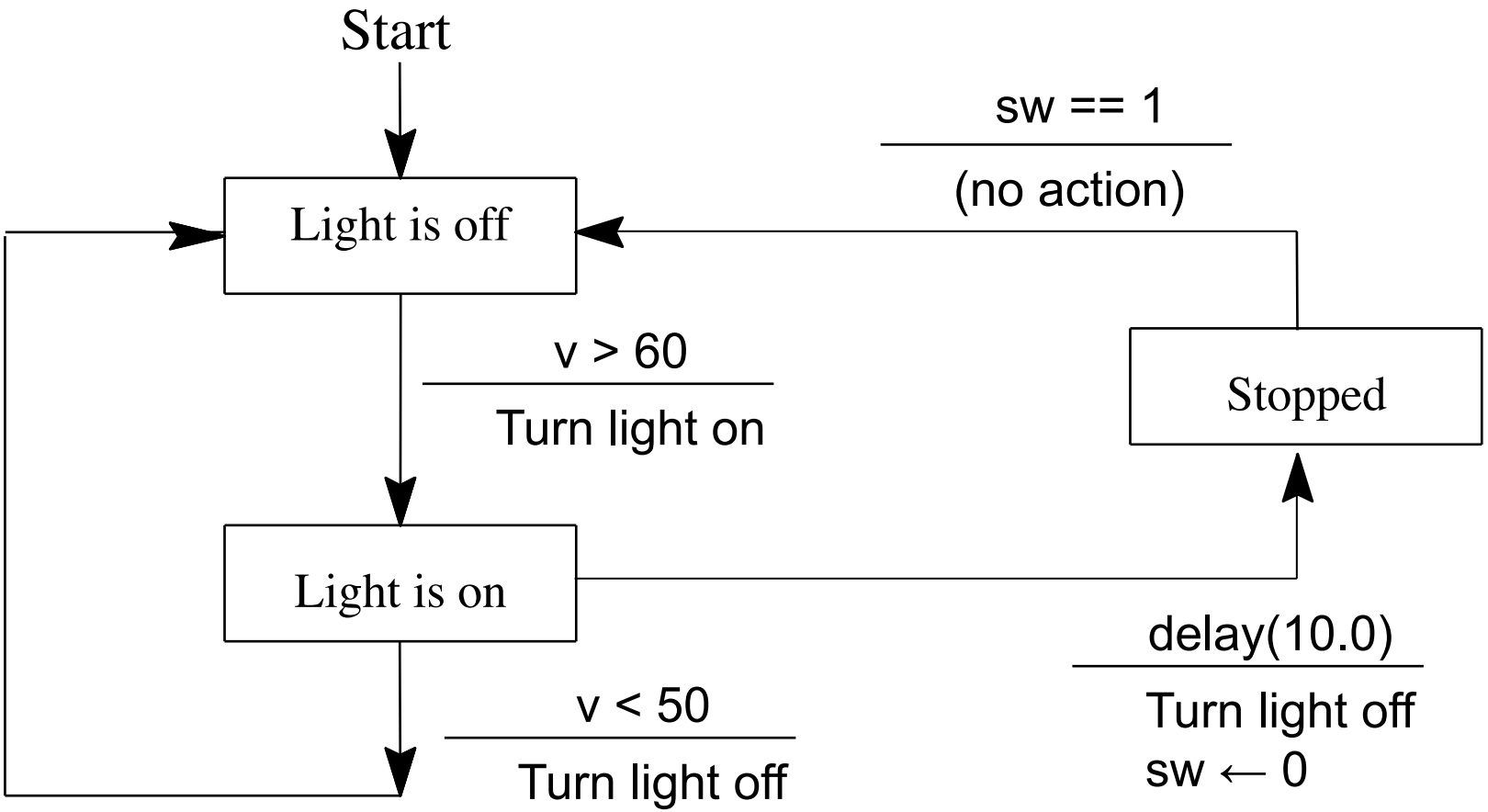
- [Step10] Edit **st.cmd** and run it.
  - Edit **~/app2/iocBoot/iocmyExample/st.cmd**

```
seq sncExample,"user=PCnameHost"
                    ↓
# seq sncExample,"user=PCnameHost"   ← add "#"
seq seqtest,"user=PCnameHost"  ← add this line
```

  - Execute **st.cmd** and then check how it works.
    - Watch the display.
    - Use dbl, dbpr, seqShow, seqChanShow commands in the iocsh.
    - camonitor
    - …

Add New State (1)

- [Step11] Modify **`seqPractice.st`** as follows.
  - Add new state "**`stopped`**"
  - "**`light_on`**" state goes to "**`stopped`**" state when time expires (10.0 sec.).
  - "**`stopped`**" state goes to "**`light_off`**" state when **`sw`** becomes 1. (assign **`sw`** to "**`{user}:Switch`**")


Start
Light is off
sw == 1
(no action)
v > 60
Turn light on
Stopped
Light is on
delay(10.0)
Turn light off
sw ← 0
v < 50
Turn light off

Add New State (2)

- [Step12] Compile and execute it.
- [Step13] Add some object on your display to control **`$(user):Switch`** record.
- [Step14] Check how it works. Its behavior depends on the SCAN period of **`$(user):Vout`** record.

- [Step15] Try any modification you like.