LAB 5 DEMO – The Last Step ***Reviewer*** _____

Team

Task Queue (20) - Designer

Doublely Linked List

Insert / Delete Supported

Shared Variables via data structs used

How are dynamic tasks managed?

All Tasks Integrated

Startup (10) – Designer

Run once at startup

Completed and Integrated

Static Tasks Created and Scheduled – Which tasks?

Time Base Started – Use Real Time Timer

Exit when complete

Measure (40) – Designer

TCB / Shared Vars

Selected Measurement / Scan supported

Tasks dynamically scheduled

Blood Pressure Cuff

- How modeled
- Increment and decrement by 10% supported?
- How are different pressures modeled?

Patient

- How is patient modeled?
- How are interrupts initiated and detected?

Systolic and Diastolic A/D measurements

- Each made following 5 ms delay from external signal?
- Made in proper order and only following signal?
- How is 5 ms delay implemented?
- Data stored in proper buffer locations

Temperature

- Measured using A/D and analogue signal
- Stored in locations if more than ±15% change
- Task dynamically scheduled

Pulse Rate Measurement

- External interrupt
- Timer / counter used?
- How was measurement initiated and performed?
- How is frequency determined?
- What is the maximum frequency that was achieved?
- Frequency range 10 – 200 bpm
- Store in circular buffer if more than ±15% change
- Task dynamically scheduled

Respiration Rate

- Measured using A/D and analogue signal
- How is conversion to pulses or breaths per minute achieved?
- Store in buffer if more than ±15% change
- Determine upper limit
- Task dynamically scheduled

Flag to schedule Compute Task on new measurement data

Data for each measurement stored in designated buffer and positions

Integrated

EKG CaptureTask (45)

TCB / Shared Vars

Selected measurement / Scan supported

Timing

Task scheduled on demand? How?

What is the sampling frequency? Why?

How is isochronous sampling rate managed and ensured?

Where is data collected – ISR or Task? Why?

Data Measurement and Collection

How many measurements collected during each sampling interval? Why?

Is the data stored in a reading buffer?

Can data be collected at various frequencies over the 35 Hz to 3.75K Hz range?

How is data converted to millivolts?

Integrated

EKG Processing Task (30)

TCB / Shared Vars

FFT

Functional

How is frequency determined

Data Management

Are 16 most recent frequencies stored?

How are the local and serial tasks informed of new data available?

Are there conflicts with other tasks or subsystems? How are they solved?

Dynamically scheduled? How signaled?

Problems? How are they solved?

Integrated

Compute (20) – Designer

TCB / Shared Vars

Ensure data available – Dynamically schedule

Raw data unchanged

tempCorrected

- How is A/D reading converted to measured voltage?
- How is voltage scaled to human temperature range?

sysCorrected

diasCorrected

prCorrected

rrCorrected

Integrated

TFT Keypad (30) - Designer

TCB / Shared Vars

Mode Select

- Measure Menu
- Display
- Annunciation

Annunciation

- Measurement and Alarm information

Menu

- Blood Pressure
- Temperature
- Pulse Rate
- Respiration Rate
- EKG

Scrolling and Selection

- In the menu mode, scroll to menu select choice
- In the annunciation mode, acknowledge alarm or warning

Integrated

Display (30) – Designer

TCB / Shared Vars

Proper colors

Measurement Mode

- Blood Pressure
  - Systolic pressure: <systolic pressure> mm Hg
  - Diastolic pressure: <diastolic pressure> mm Hg
- Temperature
  - Temperature: <temperature> C
- Pulse Rate
  - Pulse rate: <pulse rate> BPM>
- Respiration Rate
  - Respiration rate <breaths per minute>
- EKG < Measured Frequency reading > Hz

Annunciation Mode

1. Systolic pressure: <systolic pressure> mm Hg
2. Diastolic pressure: <diastolic pressure> mm Hg
3. Temperature: <temperature> C
4. Pulse rate: <pulse rate> BPM
5. Respiration rate <breaths per minute> RR
6. Battery: <charge remaining>

Integrated

Warning / Alarm (15) - Designer

TCB / Shared Vars

Normal

Display green

Warning

Display orange

Any measurement > 5% out of range

Pulse Rate - Flash with 2 sec period

Temperature - Flash with 1 sec period

Blood Pressure - Flash with 0.5 sec period

Alarm

Display red

Systolic BP more than 20 percent above or below the specified limit.

Temperature, pulse rate, or respiration rate more than 15 percent above or below the specified limit.

Battery below 20% remaining.

Flag to scheduler to schedule Serial Comms Task on warning

Integrated

Status (10) - Designer

TCB

Battery State decrement

Integrated

Peripheral Communications (30) – Designer

TCB / Shared Vars

Request Message

- Executed on demand
- Start of message
- End of message
- Requesting task identifier
- Function name
- Data required

Response Message

- Executed on demand
- Start of message
- End of message
- Requesting task identifier
- Function name
- Data required

Integrated

Remote Communications Task (30) – Designer

Serial link initialization and setup complete and functional

How implemented?

Dynamically scheduled?

How is it tested?

How is current data to be displayed received from other tasks?

Integrated

Command Task (30) – Designer

Receive

Valid Message

I, S, P, D, M, W

Invalid Message Received

E

Transmit

How does this task communicate with other tasks?

Are there conflicts with other tasks? How are these solved?

Integrated

Remote Display (30) – Designer

Information displayed?

The name of the product

The patient's name

The doctor's name.

Measurement data displayed?

Temperature:	<temperature> C
Systolic pressure:	<systolic pressure> mm Hg
Diastolic pressure:	<diastolic pressure> mm Hg
Pulse rate:	<pulse rate> BPM
EKG	< Measured Frequency reading > Hz
Battery:	<charge remaining>

Integrated