Exercise for Candidates for Embedded Software Test Engineer – Airborne Software

Instructions:

1. Given the requirement and using your definition of what a "good" requirement is, suggest improvements to the requirement. Document the update requirement statement in the space provided.

2. Using your improved requirement, specify the test cases you would develop to fully test the software that meets the requirement. Identify whether the test cases are normal range or robustness test cases. Explain why you chose the inputs. Add rows as needed.

3. Answer the question in the space provided.

Requirement:

If the Engine Output Temperature is between 580 and 600 degrees C, then the software shall annunciate an ENGINE HOT caution.

Improved Requirement:

If the Engine Output Temperature is between 580 and 600 degrees C (inclusive with 0 and 600 being the lowest and highest possible degrees, respectively), then the software shall annunciate an "ENGINE HOT caution" output to the screen.

Test Cases:

Inputs	Expected Outputs	Normal Range/ Robustness	Explanation
Minimum value for Engine Output temperature (0 C)	Engine not hot caution	Robustness	Testing what happens when the Engine output temperature is at its smallest possible value.
Maximum value for Engine Output temperature (600 C)	Engine hot caution	Robustness	Testing what happens when the Engine output temperature is at its largest possible value.
Engine Output Temperature: 579 C	Engine not hot caution	Normal range	Testing a boundary case when it is close to 580 but not within the "Engine Hot Caution".

Inputs	Expected Outputs	Normal Range/ Robustness	Explanation
Engine Output Temperature: 580 C	Engine hot caution	Normal range	Testing a boundary case when it is at 580.
Engine Output Temperature: 581 C	Engine hot caution	Normal range	Testing a boundary case when it is close to 580 but within the boundary.
Engine Output Temperature: 599 C	Engine hot caution	Normal range	Testing a boundary case when it is close to 600 but within the boundary to produce an "Engine Hot Caution" output.

Question:

If the software is supposed to detect the input value with a tolerance, for example, "580 to 600 +/- 1 degrees C", what is the expected output of the software at the following values?

578 degrees C: **caution / no caution / either**

579 degrees C: **caution / no caution / either**

580 degrees C: **caution / no caution / either**

581 degrees C: **caution / no caution / either**

582 degrees C: **caution / no caution / either**

598 degrees C: **caution / no caution / either**

599 degrees C: **caution / no caution / either**

600 degrees C: **caution / no caution / either**

601 degrees C: **caution / no caution / either**

602 degrees C: **caution / no caution / either**