Workshop - 2

Workshop Value: 10 marks (4.4% of your final grade)

Learning Outcomes

Upon successful completion of this workshop, you will have demonstrated the abilities:

- to decipher and identify a problem
- to analyze and decompose a problem
- to identify the required detailed steps to solve a problem
- to communicate the solution to fellow peers and non-technical business persons

Workshop Grading and Promotion Policy

Workshops for this course will be assessed using the following criteria:

- Workshops must be completed before the class time to be graded
- You must successfully complete 9 workshops (if more than 9 are completed, the best 9 will be used)
- Each student is expected to be a presenter of the workshop solution at least once by the end of the term
- Workshop solutions and presentations will be evaluated using the published workshop rubrics

Workshop Overview

Sometimes it is not possible to consolidate logic when the underlying process is dependent on combinations or permutations. This can be tedious as a programmer because this requires you to explicitly handle each possible state.

Workshop Details

The city winter weather dispatch service department needs a tool that will advise the city service clerks what resources are required to treat a given set of winter weather conditions.

The solution will depend on three (3) user input values that describe the weather conditions:

1. Type of Weather:
   - Snow
   - Ice
   - Mixed (combination of both snow and ice)
2. Accumulation Amount per Hour:
   - Measured in centimeters (cm) when the weather type is snow or mixed
   - Measured in millimeters (mm) when the weather type is ice
3. Temperature in degree's Celsius

The solution should analyze the input values and determine the necessary resources required to treat the weather conditions.

Use the below chart that defines the rules and conditions for each resource:

Input Conditions				Prescribed Output Actions		
Precipitation Accumulation	**Temperature < -10.0**	**Temperature -10.0 to -5.0**	**Temperature > -5.0**	**# of Plow Trucks**	**# of Sand Trucks (application rate)**	**# of Salt Trucks (application rate)**
SNOW						
<= 2.5 cm	✓				1 (Light)	
		✓				1 (Light)
			✓	**No Action Required**		
2.6 - 5.0 cm	✓				1 (Normal)	
		✓				1 (Normal)
			✓	**No Action Required**		
5.1 - 15.0 cm	✓			1	1 (Normal)	
		✓		1		1 (Normal)
			✓	1		
15.1 - 45.0 cm	✓			2	1 (Normal)	
		✓		2		1 (Normal)
			✓	2		
45.1 + cm	***State of emergency (Organize army and other jurisdiction support)***					
ICE						
<= 3.0 mm	**No Action Required**					
3.1 - 5.0 mm	✓				1 (Normal)	
		✓				1 (Normal)
			✓	**No Action Required**		
5.1 - 15.0 mm	✓				2 (Heavy)	
		✓				2 (Heavy)
			✓			1 (Heavy)
15.1 + mm	***State of emergency (Organize army and other jurisdiction support)***					
MIXED						
<= 2.5 cm	**No Action Required**					
2.6 - 5.0 cm	✓			1	1 (Light)	
		✓		1		1 (Light)
			✓	1		
5.1 - 15.0 cm	✓			1	1 (Heavy)	
		✓		1		1 (Heavy)
			✓	1		1 (Normal)
15.1 - 45.0 cm	✓			2	1 (Heavy)	
		✓		2		1 (Heavy)
			✓	2		1 (Light)
45.1 + cm	***State of emergency (Organize army and other jurisdiction support)***					

There are three (3) types of resources that can potentially be dispatched: snow plow, sand truck, and a salt truck. If a snow plow truck is required, the number of trucks should be specified. When sand or salt trucks are needed, the number of trucks required should be specified as well as the rate of application (light, normal, heavy). The solution should output a concise meaningful message that describes the necessary action(s) to take.

Your Tasks

[Logic 1] This will do the logic for selecting the salters, sanders and plows for SNOW only. It will cover all the amounts of snow and all the temperature ranges.

[Logic2] This will do the logic for selecting the salters, sanders and plows for ICE only. It will cover all the amounts of ice and all the temperature ranges.

[Logic 3] This will do the logic for selecting the salters, sanders and plows for MIXED only. It will cover all the amounts of mixed precipitation and all the temperature ranges.

1. Define the solution applying what you know about the computational thinking approach to problem solving
2. Communicate the solution using pseudo code and a flowchart
3. Create a video presenting the problem, the solution from a high-level perspective, and arguing why it is a good solution.
4. The responsibilities of each student are shown in the table below.

Task	Subtask	Member(s)	Marks	Comments
Pseudocode	Logic 1	4	40%	
	Logic 2	5	40%	
	Logic 3	6	40%	
	Combined	4-6	60%	
FlowChart	Logic 1	1	40%	
	Logic 2	2	40%	
	Logic 3	3	40%	
	Combined	1-3	60%	
Video	Presentation	2 or 5	100%	Members rotate weekly