

Workshop - 2

Workshop Value: 10 marks (4.375% 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 businesspersons

Please review the following documents:

1. Workshop [Grading Policies](#)
 2. Workshop [Submission Procedures](#)
 3. Workshop [Group Breakdown](#)
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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 web application tool that can be used to advise the city service clerks what resources are required to treat a given set of winter weather conditions. The **web application** you develop will replace the manual chart-based method currently being used.

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 degrees Celsius

Your solution will need to analyze the input values and determine the necessary resources required to treat the weather conditions. Refer to the chart on the next page that is currently used by staff.

There are three (3) types of resources that can potentially be dispatched: snowplow, sand truck, and a salt truck. If a snowplow 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 to the clerk (user) the necessary action(s) to take.

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

Input Conditions				Prescribed Output Actions		
Precipitation Accumulation	Temperature < -15.0	Temperature -15.0 to -7.0	Temperature > -7.0	# of Plow Trucks	# of Sand Trucks (application rate)	# of Salt Trucks (application rate)
SNOW						
<= 2.0 cm	✓				1 (Light)	
		✓				1 (Light)
			✓	No Action Required		
>2.0 - 5.75 cm	✓				1 (Normal)	
		✓				1 (Normal)
			✓	No Action Required		
>5.75 - 15.5 cm	✓			1	1 (Normal)	
		✓		1		1 (Normal)
			✓	1		
>15.5 - 42.5 cm	✓			2	1 (Normal)	
		✓		2		1 (Normal)
			✓	2		
>42.5 cm	State of emergency (Organize army and other jurisdiction support)					
ICE						
<= 3.0 mm	No Action Required					
>3.0 - 5.5 mm	✓				1 (Normal)	
		✓				1 (Normal)
			✓	No Action Required		
>5.5 - 17.0 mm	✓				2 (Heavy)	
		✓				2 (Heavy)
			✓			1 (Heavy)
>17.0 mm	State of emergency (Organize army and other jurisdiction support)					
MIXED						
<= 3.5 cm	No Action Required					
>3.5 - 5.75 cm	✓			1	1 (Light)	
		✓		1		1 (Light)
			✓	1		
>5.75 - 16.5 cm	✓			1	1 (Heavy)	
		✓		1		1 (Heavy)
			✓	1		1 (Normal)
>16.5 - 40.0 cm	✓			2	1 (Heavy)	
		✓		2		1 (Heavy)
			✓	2		1 (Light)
>40.0 cm	State of emergency (Organize army and other jurisdiction support)					

Work Breakdown

[Logic 1] 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.

[Logic2] 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.

[Logic 3] 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.

Your Tasks

Individual Logic Assignment

1. Determine your individual assigned logic part based on your member# (see **Group Breakdown** link at the beginning of this document)
2. Where applicable, apply the core components of the **computational thinking** approach to problem solving to help you synthesize a solution
3. Submit your individual assigned part to your professor (see **Submission Procedures** link at the beginning of this document)

Group Solution

1. In the week the workshop is scheduled, you will be working in your assigned sub-group. See **Group Breakdown** link at the beginning of this document for details on how the sub-groups are determined.
2. Please review what is expected as described in the **Grading Policies** link at the beginning of this document.
3. Submit your group solution to your professor (if you are handing in physical paper answers, follow the directions as set by your professor, otherwise, refer to the **Submission Procedures** link at the beginning of this document)

Presentation

Decide among yourselves which member among you in the sub- group will be doing a presentation. Priority should be given to those who have not yet done one. Refer to the **Grading Policies**, and **Submission Procedures** links for details on deadlines, expectations and how to submit your work.