

BICOL UNIVERSITY, POLANGUI

POLANGUI, ALBAY

AY : 2024 - 2025

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**Subject:** Data Structure and Algorithms

**Course/Year:** BS Information System-2A

**Professor:** Khristine Botin

**Title:** Speed Tracker's Typhoon Challenge

**Theme:** Manage the typhoon speed using heaps to sort and prioritize them by speed!

**Explanation** : The "Speed Tracker's Typhoon Challenge" in the provided code is a simulation of managing a collection of typhoons based on their wind speeds using a **heap** data structure.

The goal is to manage and organize a list of typhoons based on their **wind speeds** using a heap. The heap allows for efficient insertion, removal, and conversion between a **Min-Heap** and a **Max-Heap**.

**You will complete the following tasks:**

· **Insert multiple typhoons (with their speeds) into a Max-Heap and display the heap after each addition.**

· **Convert the Max-Heap into a Min-Heap for easier handling of slower typhoons.**

· **Heapify a random list of typhoon speeds into a Max-Heap.**

**CODE INSTRUCTIONS**

### ****1. Add multiple typhoon speeds (Option 1)****

* Participants need to enter the number of typhoons they want to add.
* For each typhoon, they will input the speed of the typhoon.
* Each speed is added to the heap, and push\_heap() ensures the heap property (Max-Heap by default) is maintained.

### ****2. Display the current heap (Option 2)****

* Participants will select this option to view the current state of the heap (whether it's a Max-Heap or Min-Heap).

### ****3. Convert to Min-Heap (Option 3)****

* Selecting this option sorts the heap in ascending order using sort() to create a Min-Heap.
* The Min-Heap displays typhoon speeds starting from the lowest at the root.

### ****4. Convert to Max-Heap (Option 4)****

* This option reorganizes the heap back into a Max-Heap using make\_heap(), ensuring the highest speed becomes the root again.

### ****5. Exit (Option 5)****

* Selecting this option ends the program.

**INPUT/OUTPUT**



