CSE220: Data Structures (Lab)
Fall 2024
Lab Quiz - 06
Duration: 30 Minutes

A

Name:	ID:	Section:

Question 1 [15 Points]

The Brac University Library is prioritizing books for purchase based on their **demand** and **ratings** by students. Two arrays are provided:

- **`arr1`**: Demand for books (number of requests).
- **`arr2`**: Average student ratings for the books (scale of 1 to 5).

Books with **higher priority scores** should be **purchased first**. The **purchase priority score** for each book is calculated as:

```
priority_score = demand × rating
```

Your task is to:

1. Create the **purchase priority scores array** using the above formula.
2. Determine the **appropriate type of heap** required to prioritize books for purchase.
3. **Construct the heap** using the priority scores.
4. Extract the **top 3 books** to be purchased first based on their priority scores.

Sample Input:	**Expected Output:**
arr1 = [50, 80, 40, 60, 52] arr2 = [4.5, 4.8, 4.0, 4.2, 4.7]	Priority Scores: [225, 384, 160, 252, 245] Top Books: 384, 252, 245

Note: Assume the **`extract()`** and **`sink()`** methods are already implemented and can be used directly. You need to **implement other required methods** and **make the necessary method calls** to complete the task. You are not allowed to use any built-in functions except **len()**.