EEE 103 - Computer Programming

Sorting Algorithms

Bubble and Selection Sort

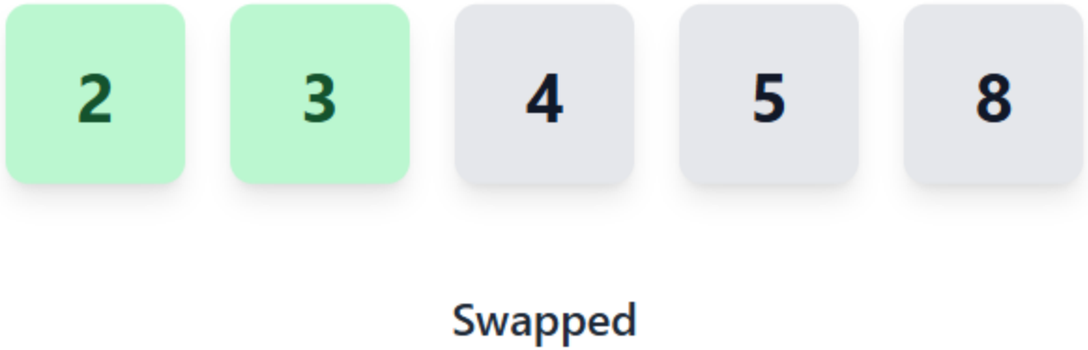
Prepared by: Sk Tahmed Salim Rafid

What is Bubble Sort?

- Bubble Sort is a simple comparison-based sorting algorithm.
- It repeatedly iterates through the list, compares adjacent elements, and swaps them if they are in the wrong order.
- Each pass "bubbles" the largest unsorted element to its correct position.
- The algorithm continues until no more swaps are needed.

Bubble Sort Step-by-Step Animation

Array: [5, 3, 8, 4, 2]



Bubble Sort Implementation in C

Example with array [5, 3, 8, 4, 2]

```c
#include <stdio.h>

void bubbleSort(int arr[], int n) {
 int i, j, temp;
 for (i = 0; i < n-1; i++) {
 for (j = 0; j < n-i-1; j++) {
 if (arr[j] > arr[j+1]) {
 temp = arr[j];
 arr[j] = arr[j+1];
 arr[j+1] = temp;
 }
 }
 }
}

int main() {
 int arr[] = {5, 3, 8, 4, 2};
 int n = sizeof(arr)/sizeof(arr[0]);
 int i;
 printf("Before: ");
```

What is Selection Sort?

- Selection Sort is a simple comparison-based sorting algorithm.
- It divides the input list into sorted and unsorted regions.
- In each iteration, it finds the minimum element in the unsorted region.
- It swaps the minimum with the first element of the unsorted region.
- The process repeats until the array is sorted.

Selection Sort Step-by-Step Animation

Array: [5, 3, 8, 4, 2]

Swapped with min

Selection Sort Implementation in C

Example with array [5, 3, 8, 4, 2]

```c
#include <stdio.h>

void selectionSort(int arr[], int n) {
 int i, j, min_idx, temp;
 for (i = 0; i < n-1; i++) {
 min_idx = i;
 for (j = i+1; j < n; j++) {
 if (arr[j] < arr[min_idx]) {
 min_idx = j;
 }
 }
 if (min_idx != i) {
 temp = arr[i];
 arr[i] = arr[min_idx];
 arr[min_idx] = temp;
 }
 }
}

int main() {
```

Thank You

Keep practicing — happy coding!