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DSA LAB TASK 12:-

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Question # 1:-

DRY RUN

Initial array $\{ 5, 3, 8, 1, 7 \}$

Iteration 1 ($i=1$)

- Key = 3, $j=0$
- Compare arr[j] (5) with key (3), $5 > 3$, no change
- $\{ 5, 3, 8, 1, 7 \}$

Iteration 2 ($i=2$)

- Key = 8, $j=1$
- Compare arr[j] (3) with key 8, $3 < 8$, move 3 to arr[j+1]
- Compare arr[j-1] (5) with key 8, $5 < 8$, move 5 to arr[j]
- Insert key (8) at arr[j+1]
- Array after 2nd iteration $[8, 5, 3, 1, 7]$

Iteration 3 ($i=3$)

- Key = 1, $j=2$
- Compare arr[j] 3 with key 1, $3 > 1$, no change
- $\{ 8, 5, 3, 1, 7 \}$

Iteration 4 ($i=4$)

- Key 7, $j=3$, $1 < 7$ move 1 to arr[j+1]
- Compare arr[j-1] (3) with key (7), $3 < 7$ move 3 to arr[j].
- Compare arr[j-2] (5) with key (7), $5 < 7$ move 5 to arr[j-1]
- Insert key (7) at arr[j+1]
- $\{ 8, 7, 5, 3, 1 \}$

Final ARRAY:-

$\{ 8, 7, 5, 3, 1 \}$

Question #2

Bubble sort DRY RUN { 7, 2, 5, 3, 9, 1, 6, 4, 8 }

Ascending order:-

Iteration 1

Swap [7 \leftrightarrow 2], [7 \leftrightarrow 5], [7 \leftrightarrow 3], [9 \leftrightarrow 1], [9 \leftrightarrow 6], [9 \leftrightarrow 4], [9 \leftrightarrow 8]

Array [2, 5, 3, 7, 1, 6, 4, 8, 9]

Iteration 2

Swap [5 \leftrightarrow 3], [7 \leftrightarrow 1], [7 \leftrightarrow 6], [7 \leftrightarrow 4]

Array [2, 3, 5, 1, 6, 4, 7, 8, 9]

Iteration 3:-

Swap [5 \leftrightarrow 1], [6 \leftrightarrow 4]

Array [2, 3, 1, 5, 4, 6, 7, 8, 9]

Iteration 4:-

Swap [3 \leftrightarrow 1], [5 \leftrightarrow 4]

Array [2, 1, 3, 4, 5, 6, 7, 8, 9]

Iteration 5:-

Swap [2 \leftrightarrow 1]

Array [1, 2, 3, 4, 5, 6, 7, 8, 9]

Iteration 6:-

No Swap, Array Sorted

Final Array:

{ 1, 2, 3, 4, 5, 6, 7, 8, 9 }