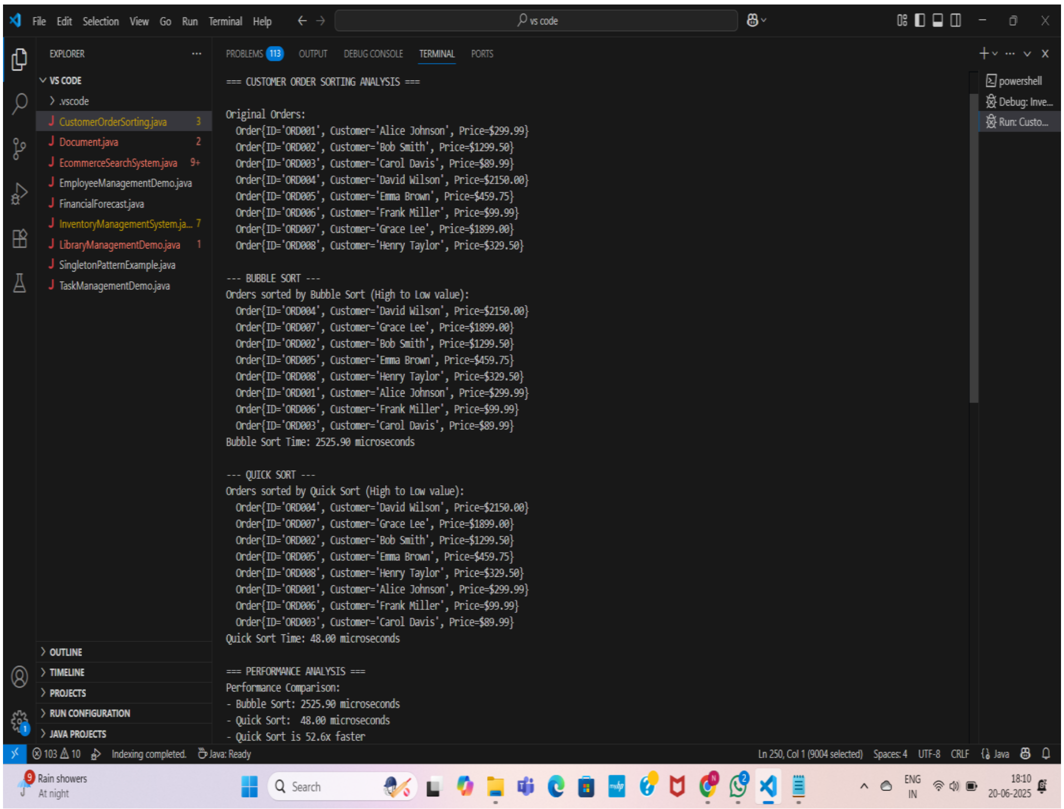
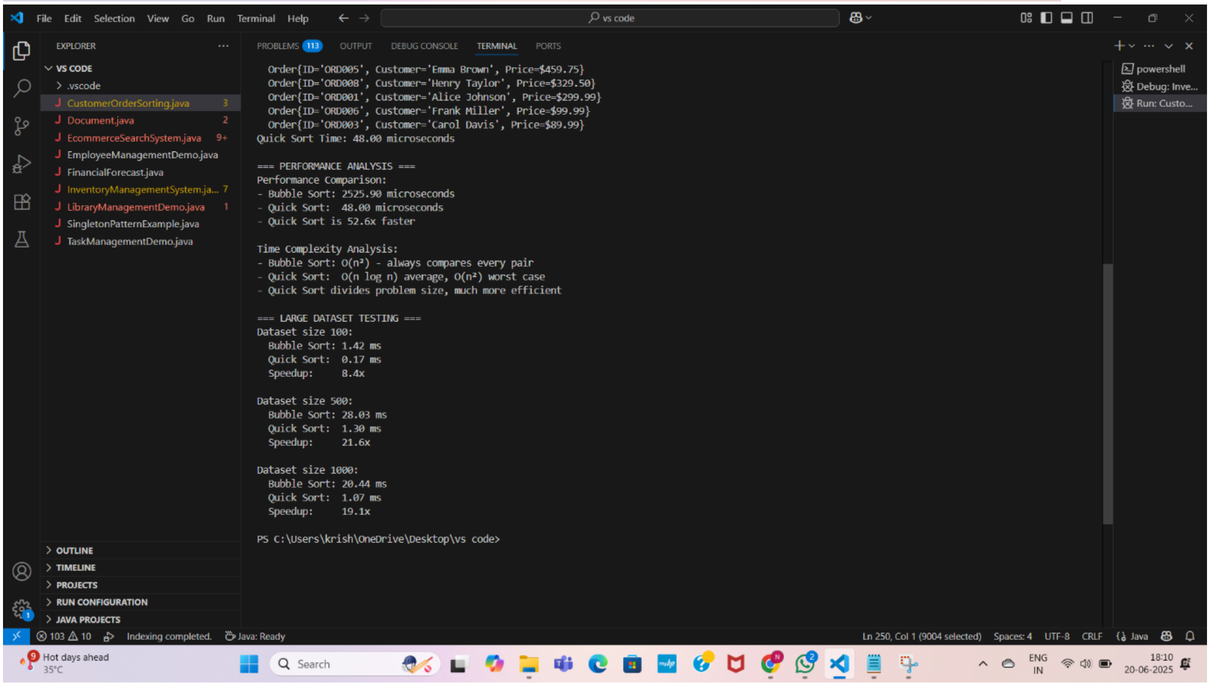
CUSTOMER ORDER SORTING OUTPUT:



```
=== CUSTOMER ORDER SORTING ANALYSIS ===

Original Orders:
  Order{ID='ORD001', Customer='Alice Johnson', Price=$299.99}
  Order{ID='ORD002', Customer='Bob Smith', Price=$1299.50}
  Order{ID='ORD003', Customer='Carol Davis', Price=$89.99}
  Order{ID='ORD004', Customer='David Wilson', Price=$2150.00}
  Order{ID='ORD005', Customer='Emma Brown', Price=$459.75}
  Order{ID='ORD006', Customer='Frank Miller', Price=$99.99}
  Order{ID='ORD007', Customer='Grace Lee', Price=$1899.00}
  Order{ID='ORD008', Customer='Henry Taylor', Price=$329.50}

--- BUBBLE SORT ---
Orders sorted by Bubble Sort (High to Low value):
  Order{ID='ORD004', Customer='David Wilson', Price=$2150.00}
  Order{ID='ORD007', Customer='Grace Lee', Price=$1899.00}
  Order{ID='ORD002', Customer='Bob Smith', Price=$1299.50}
  Order{ID='ORD005', Customer='Emma Brown', Price=$459.75}
  Order{ID='ORD008', Customer='Henry Taylor', Price=$329.50}
  Order{ID='ORD001', Customer='Alice Johnson', Price=$299.99}
  Order{ID='ORD006', Customer='Frank Miller', Price=$99.99}
  Order{ID='ORD003', Customer='Carol Davis', Price=$89.99}
Bubble Sort Time: 2525.90 microseconds

--- QUICK SORT ---
Orders sorted by Quick Sort (High to Low value):
  Order{ID='ORD004', Customer='David Wilson', Price=$2150.00}
  Order{ID='ORD007', Customer='Grace Lee', Price=$1899.00}
  Order{ID='ORD002', Customer='Bob Smith', Price=$1299.50}
  Order{ID='ORD005', Customer='Emma Brown', Price=$459.75}
  Order{ID='ORD008', Customer='Henry Taylor', Price=$329.50}
  Order{ID='ORD001', Customer='Alice Johnson', Price=$299.99}
  Order{ID='ORD006', Customer='Frank Miller', Price=$99.99}
  Order{ID='ORD003', Customer='Carol Davis', Price=$89.99}
Quick Sort Time: 48.00 microseconds

=== PERFORMANCE ANALYSIS ===
Performance Comparison:
- Bubble Sort: 2525.90 microseconds
- Quick Sort:  48.00 microseconds
- Quick Sort is 52.6x faster
```

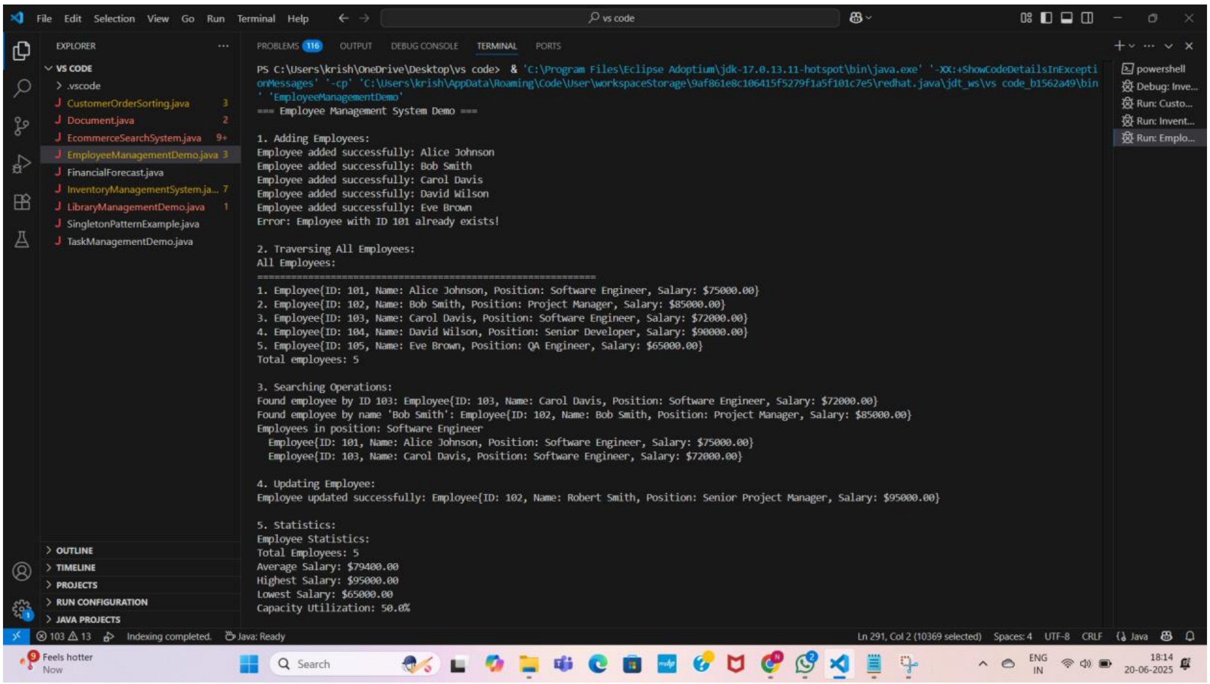
File Edit Selection View Go Run Terminal Help
vs code
EXPLORER
VS CODE
.vscode
CustomerOrderSorting.java
Document.java
EcommerceSearchSystem.java
EmployeeManagementDemo.java
FinancialForecast.java
InventoryManagementSystem.ja...
LibraryManagementDemo.java
SingletonPatternExample.java
TaskManagementDemo.java
OUTLINE
TIMELINE
PROJECTS
RUN CONFIGURATION
JAVA PROJECTS
PROBLEMS 113 OUTPUT DEBUG CONSOLE TERMINAL PORTS
powershell
Debug: Inve...
Run: Custo...
Ln 250, Col 1 (9004 selected) Spaces: 4 UTF-8 CRLF Java
Indexing completed. Java: Ready
Rain showers
At night
Search
18:10
20-06-2025



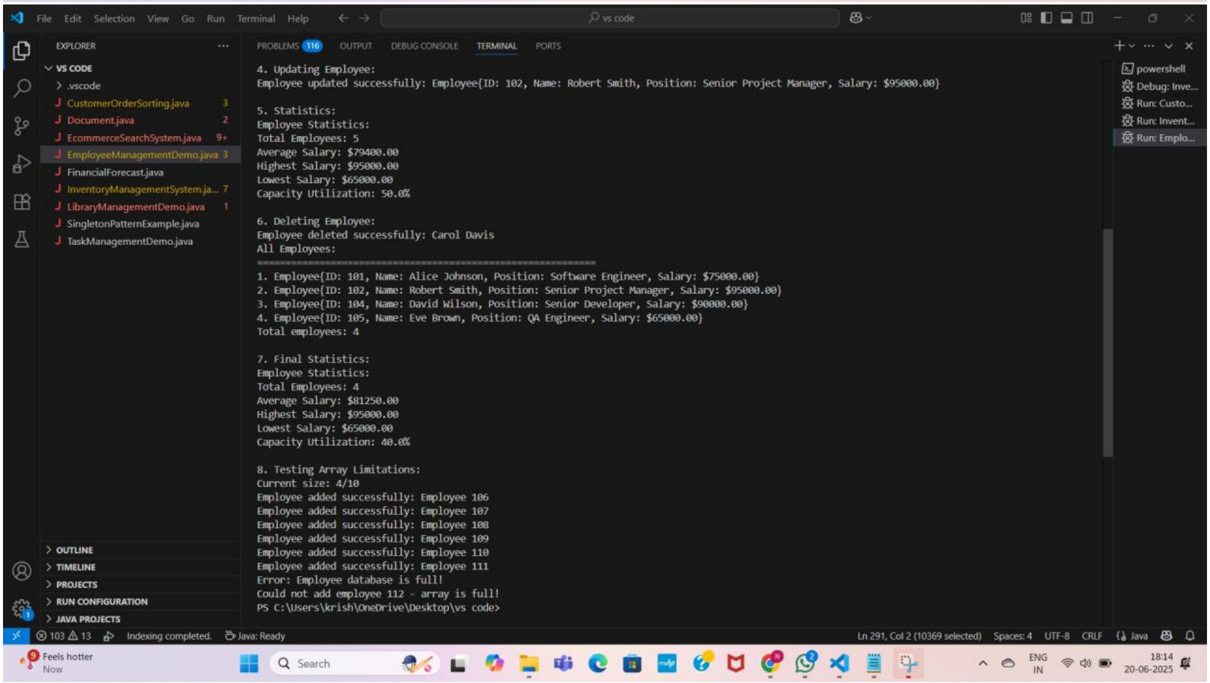
```
  Order{ID='ORD005', Customer='Emma Brown', Price=$459.75}
  Order{ID='ORD008', Customer='Henry Taylor', Price=$329.50}
  Order{ID='ORD001', Customer='Alice Johnson', Price=$299.99}
  Order{ID='ORD006', Customer='Frank Miller', Price=$99.99}
  Order{ID='ORD003', Customer='Carol Davis', Price=$89.99}
Quick Sort Time: 48.00 microseconds

=== PERFORMANCE ANALYSIS ===
Performance Comparison:
- Bubble Sort: 2525.90 microseconds
- Quick Sort:  48.00 microseconds
- Quick Sort is 52.6x faster

Time Complexity Analysis:
- Bubble Sort: O(n²) - always compares every pair
- Quick Sort:  O(n log n) average, O(n²) worst case
- Quick Sort divides problem size, much more efficient

=== LARGE DATASET TESTING ===
Dataset size 100:
  Bubble Sort: 1.42 ms
  Quick Sort:  0.17 ms
  Speedup:     8.4x

Dataset size 500:
  Bubble Sort: 28.03 ms
  Quick Sort:  1.30 ms
  Speedup:     21.6x

Dataset size 1000:
  Bubble Sort: 20.44 ms
  Quick Sort:  1.07 ms
  Speedup:     19.1x

PS C:\Users\krish\OneDrive\Desktop\vs code>
```

File Edit Selection View Go Run Terminal Help
vs code
EXPLORER
VS CODE
.vscode
CustomerOrderSorting.java
Document.java
EcommerceSearchSystem.java
EmployeeManagementDemo.java
FinancialForecast.java
InventoryManagementSystem.ja...
LibraryManagementDemo.java
SingletonPatternExample.java
TaskManagementDemo.java
OUTLINE
TIMELINE
PROJECTS
RUN CONFIGURATION
JAVA PROJECTS
PROBLEMS 113 OUTPUT DEBUG CONSOLE TERMINAL PORTS
powershell
Debug: Inve...
Run: Custo...
Ln 250, Col 1 (9004 selected) Spaces: 4 UTF-8 CRLF Java
Indexing completed. Java: Ready
Hot days ahead
35°C
Search
18:10
20-06-2025

EMPLOYEE MANAGEMENT SYSTEM DEMO:

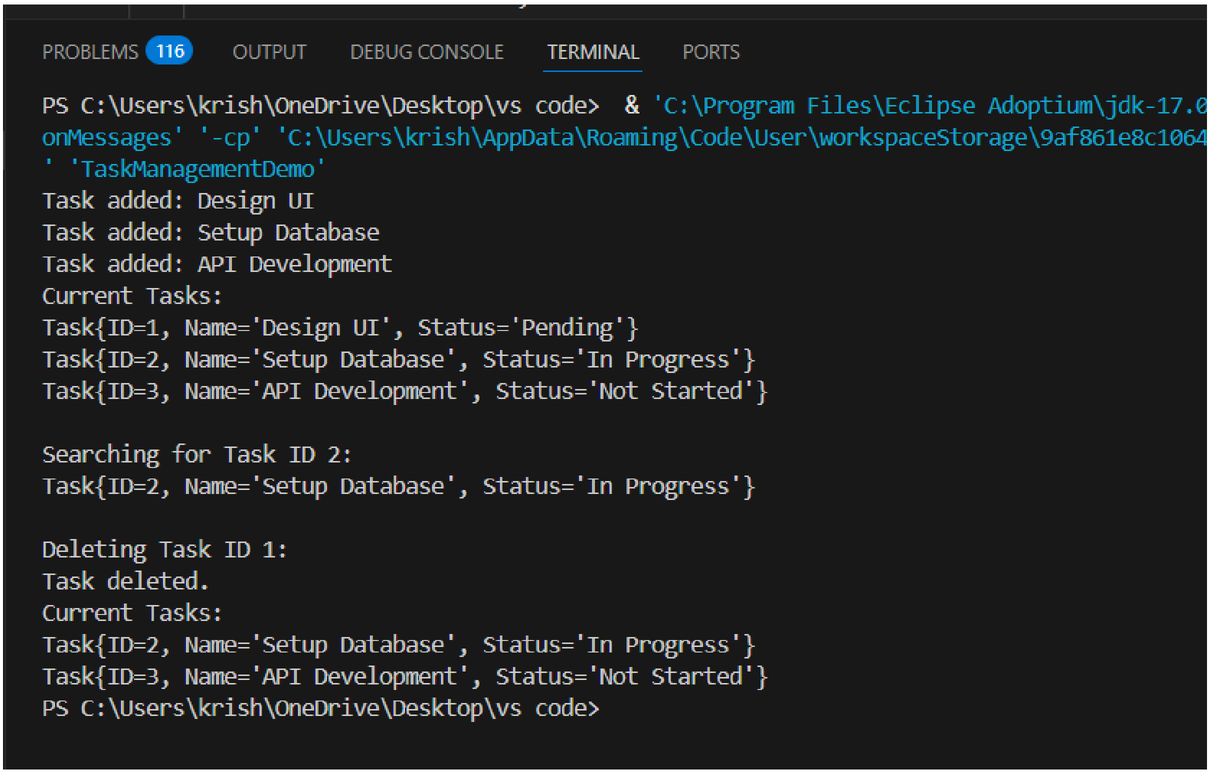


```
PS C:\Users\krish\OneDrive\Desktop\vs code>  & 'C:\Program Files\Eclipse Adoptium\jdk-17.0.13.11-hotspot\bin\java.exe' '-XX:+ShowCodeDetailsInExcepti
onMessages' '-cp' 'C:\Users\krish\AppData\Roaming\Code\User\workspaceStorage\9af861e8c106415f5279f1a5f101c7e5\redhat.java\jdt_ws\vs code_b1562a49\bin
' 'EmployeeManagementDemo'
=== Employee Management System Demo ===

1. Adding Employees:
Employee added successfully: Alice Johnson
Employee added successfully: Bob Smith
Employee added successfully: Carol Davis
Employee added successfully: David Wilson
Employee added successfully: Eve Brown
Error: Employee with ID 101 already exists!

2. Traversing All Employees:
All Employees:
============================================================
1. Employee{ID: 101, Name: Alice Johnson, Position: Software Engineer, Salary: $75000.00}
2. Employee{ID: 102, Name: Bob Smith, Position: Project Manager, Salary: $85000.00}
3. Employee{ID: 103, Name: Carol Davis, Position: Software Engineer, Salary: $72000.00}
4. Employee{ID: 104, Name: David Wilson, Position: Senior Developer, Salary: $90000.00}
5. Employee{ID: 105, Name: Eve Brown, Position: QA Engineer, Salary: $65000.00}
Total employees: 5

3. Searching Operations:
Found employee by ID 103: Employee{ID: 103, Name: Carol Davis, Position: Software Engineer, Salary: $72000.00}
Found employee by name 'Bob Smith': Employee{ID: 102, Name: Bob Smith, Position: Project Manager, Salary: $85000.00}
Employees in position: Software Engineer
  Employee{ID: 101, Name: Alice Johnson, Position: Software Engineer, Salary: $75000.00}
  Employee{ID: 103, Name: Carol Davis, Position: Software Engineer, Salary: $72000.00}

4. Updating Employee:
Employee updated successfully: Employee{ID: 102, Name: Robert Smith, Position: Senior Project Manager, Salary: $95000.00}

5. Statistics:
Employee Statistics:
Total Employees: 5
Average Salary: $79400.00
Highest Salary: $95000.00
Lowest Salary: $65000.00
Capacity Utilization: 50.0%
```



```
4. Updating Employee:
Employee updated successfully: Employee{ID: 102, Name: Robert Smith, Position: Senior Project Manager, Salary: $95000.00}

5. Statistics:
Employee Statistics:
Total Employees: 5
Average Salary: $79400.00
Highest Salary: $95000.00
Lowest Salary: $65000.00
Capacity Utilization: 50.0%

6. Deleting Employee:
Employee deleted successfully: Carol Davis
All Employees:
============================================================
1. Employee{ID: 101, Name: Alice Johnson, Position: Software Engineer, Salary: $75000.00}
2. Employee{ID: 102, Name: Robert Smith, Position: Senior Project Manager, Salary: $95000.00}
3. Employee{ID: 104, Name: David Wilson, Position: Senior Developer, Salary: $90000.00}
4. Employee{ID: 105, Name: Eve Brown, Position: QA Engineer, Salary: $65000.00}
Total employees: 4

7. Final Statistics:
Employee Statistics:
Total Employees: 4
Average Salary: $81250.00
Highest Salary: $95000.00
Lowest Salary: $65000.00
Capacity Utilization: 40.0%

8. Testing Array Limitations:
Current size: 4/10
Employee added successfully: Employee 106
Employee added successfully: Employee 107
Employee added successfully: Employee 108
Employee added successfully: Employee 109
Employee added successfully: Employee 110
Employee added successfully: Employee 111
Error: Employee database is full!
Could not add employee 112 - array is full!
PS C:\Users\krish\OneDrive\Desktop\vs code>
```

TASK MANAGEMENT DEMO:



```
PS C:\Users\krish\OneDrive\Desktop\vs code>  & 'C:\Program Files\Eclipse Adoptium\jdk-17.0
onMessages' '-cp' 'C:\Users\krish\AppData\Roaming\Code\User\workspaceStorage\9af861e8c1064
' 'TaskManagementDemo'
Task added: Design UI
Task added: Setup Database
Task added: API Development
Current Tasks:
Task{ID=1, Name='Design UI', Status='Pending'}
Task{ID=2, Name='Setup Database', Status='In Progress'}
Task{ID=3, Name='API Development', Status='Not Started'}

Searching for Task ID 2:
Task{ID=2, Name='Setup Database', Status='In Progress'}

Deleting Task ID 1:
Task deleted.
Current Tasks:
Task{ID=2, Name='Setup Database', Status='In Progress'}
Task{ID=3, Name='API Development', Status='Not Started'}
PS C:\Users\krish\OneDrive\Desktop\vs code>
```