# Technical Requirements

## Non-Functional Requirements

**1. Performance**

* **Response Time:** User input and calculations should be completed within **3 seconds**.
* **Throughput:** Support **100 orders per minute** without lag.

**2. Usability**

* **Ease of Use:** Guided order flow; completion within **2 minutes**.
* **Formatting:** Console output should be **readable, aligned, and intuitive**.
* **Learnability:** New users should operate efficiently within **15 minutes** of training.

**3. Availability & Reliability**

* **Uptime:** **99% availability** during business hours.
* **Error Handling:** Clear prompts for invalid inputs, ensuring **data integrity and fault tolerance**.

**4. Scalability**

* Support **10,000 orders per day** without performance issues.
* **Future-ready** for database integration and multi-order processing.

**5. Security**

* **Data Privacy:** No persistent storage of personal data without encryption.
* **Input Validation:** Prevent unexpected inputs and **injection attacks**.

**6. Maintainability**

* **Code Structure:** Modular, well-commented, and maintainable.
* **Error Logging:** Generate logs for troubleshooting.

**7. Portability**

* Compatible with **Windows, macOS, and Linux** with minimal dependencies.

**8. Compliance**

* **Tax Compliance:** Enforce **9.5% tax** calculation.
* **Financial Accuracy:** Dollar amounts formatted correctly with **two decimal places**.

**9. Testing & Completion Criteria**

* **Unit Test Coverage:** **90%+** for calculations and input handling.
* **System Testing:** All functional and non-functional tests must pass.
* **Load Testing:** Simulate **500 concurrent orders** for performance validation

## Entity Relationship Diagram

A screenshot of a computer

AI-generated content may be incorrect.

## Class Diagrams

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## Sequence Diagram

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## Class Responsibility Collaboration

|  |  |
| --- | --- |
| **Clerk** | |
| Takes order from customer.  Inputs customer details.  Displays invoice to the customer. | OrderSystem (to start order processing)  Order (to store order details)  Customer (to store customer details) |

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| --- | --- |
| **Customer** | |
| Stores shipping details.  Provides address validation (optional for later versions). | Order (order is associated with a customer) |

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| --- | --- |
| **Order** | |
| Stores order details (number of anvils, subtotal, tax, total).  Calculates subtotal, tax, and total.  Determines shipping cost. | Pricing (for per-anvil pricing).  Customer (for shipping address).  Invoice (to generate the invoice). |

|  |  |
| --- | --- |
| **Pricing** | |
| Provides per-anvil price based on quantity.  Determines shipping cost rules (e.g., free shipping in CA/OR). | Order (to calculate costs). |

|  |  |
| --- | --- |
| **Invoice** | |
| Generates a formatted invoice with order details.  Displays invoice to the user. | Order (fetches order details). |

|  |  |
| --- | --- |
| **OrderSystem** | |
| Manages the overall flow of order processing.  Calls appropriate methods for calculations and invoice generation. | Clerk (user interaction).  Order (handles order details).  Invoice (for displaying final order summary). |

## Task Object Responsibility

|  |  |  |
| --- | --- | --- |
| **Task** | **Object** | **Responsibility** |
| Start order-taking process | OrderSystem | Initiate the order-taking session. |
| Capture clerk’s name | Clerk | Inputs the clerk’s name at the start. |
| Prompt for number of anvils | OrderSystem | Displays input prompt for quantity. |
| Capture customer details | Customer | Stores name and shipping address. |
| Determine price per anvil | Pricing | Provides pricing based on quantity tiers. |
| Calculate subtotal | Order | Multiplies quantity by price per anvil. |
| Apply sales tax | Order | tax calculations (9.5%) on subtotal. |
| Determine shipping cost | Order | Computers shipping fee based on location. |
| Check for free shipping | Pricing | Determines free shipping eligibility. |
| Generate invoice | Invoice | Formats and stores invoice details. |
| Display order summary | OrderSystem | Presents subtotal, tax, total, and shipping. |
| Display invoice to user | Invoice | Shows formatted invoice with all details. |
| Confirm order completion | Clerk | Finalizes the order after review. |
| End order session | OrderSystem | Ends execution after invoice confirmation. |

## State Diagrams

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