**System Assumptions & Risk Mitigation Strategies**

**1. Timezone & Date Management**

**Risk Identified**: Australian trader operating in US markets creates date confusion when system runs across midnight Australian time.

**Assumptions**:

* Trader is in Australia (UTC+10/11)
* Trading US markets (ET timezone)
* CSV files are generated based on **user's local date** (Australia)
* System may run continuously across multiple days

**Code Adjustments**:

* Dual timezone tracking: Local timezone + Market timezone
* Market date calculation uses US Eastern Time for CSV file identification
* State persistence tracks alerts by market date, not local date
* 4 PM ET cutoff determines trading day boundaries

**2. Alert Deduplication & State Persistence**

**Risk Identified**: System restarts could cause duplicate trades on same alerts.

**Assumptions**:

* System may crash or restart multiple times per day
* CSV alerts persist throughout the day
* Each alert should only be processed once

**Code Adjustments**:

* Unique alert ID: timestamp\_symbol combination
* Persistent state file tracks all processed alerts by date
* State survives restarts with backup mechanism
* Atomic file writes prevent corruption

**3. Position Recovery & Synchronization**

**Risk Identified**: System crash could leave positions untracked or create phantom positions.

**Assumptions**:

* IBKR maintains actual positions independently
* System tracking may diverge from reality
* Time-based exits must be honored even after restart

**Code Adjustments**:

* On startup: Full position sync with IBKR
* Detects and handles "phantom" positions (tracked but not in IBKR)
* Detects and handles "untracked" positions (in IBKR but not tracked)
* Recovers pending exits with time validation

**4. Order Execution Reliability**

**Risk Identified**: Orders could fail, partially fill, or get lost during transmission.

**Assumptions**:

* Network issues may occur
* IBKR may reject orders
* Stop orders must always be attached to entries

**Code Adjustments**:

* Bracket order implementation (entry + stop as atomic unit)
* Order status event monitoring
* Parent/child order relationship tracking
* No profit targets - only stop loss for risk management

**5. Connection Management**

**Risk Identified**: IBKR connection could drop during trading.

**Assumptions**:

* TWS/Gateway may disconnect unexpectedly
* Network interruptions occur
* API errors need handling

**Code Adjustments**:

* Safety check blocks live trading port (7496)
* Comprehensive error code filtering
* Event-driven status updates
* Graceful disconnection handling

**6. File System & Cross-Platform Compatibility**

**Risk Identified**: Windows file locking differs from Unix systems.

**Assumptions**:

* System runs on Windows
* Multiple processes may access state files
* File operations need atomicity

**Code Adjustments**:

* Removed Unix-only fcntl module
* Windows-compatible atomic file operations
* Retry logic for file access
* Backup state files for recovery

**7. Risk Management Enforcement**

**Risk Identified**: Overtrading or excessive position sizes could occur.

**Assumptions**:

* Daily limits must be strictly enforced
* Position sizing must account for available capital
* Concurrent position limits are critical

**Code Adjustments**:

* Pre-trade validation checks all limits
* Capital allocation considers open positions
* Daily counters persist across restarts
* Real-time account value updates

**8. Market Hours & Trading Window**

**Risk Identified**: Trades could be attempted outside market hours.

**Assumptions**:

* US market hours: 9:30 AM - 4:00 PM ET
* Alerts may arrive outside these hours
* System should not waste resources when market is closed

**Code Adjustments**:

* Market hours validation before processing
* Efficient waiting (60-second checks outside hours)
* Weekend detection
* Test mode option for validation

**9. CSV File Management**

**Risk Identified**: CSV files may not exist at market open or have varying formats.

**Assumptions**:

* Holly AI generates files with specific naming convention
* Files may appear after market open
* Column names must match configuration

**Code Adjustments**:

* File waiting logic near market open (5-minute timeout)
* Flexible column mapping via configuration
* Row-by-row error handling
* Resistance price parsing from descriptions

**10. Data Integrity & Cleanup**

**Risk Identified**: State files could grow indefinitely, causing performance issues.

**Assumptions**:

* Historical data beyond 30 days is not needed
* Daily statistics are valuable for analysis
* State file size should remain manageable

**Code Adjustments**:

* Automatic cleanup of data older than 30 days
* Separate tracking by date for easy purging
* Backup before cleanup operations

**Critical Safety Features Implemented**

1. **No Duplicate Trades**: Every alert has unique ID, tracked persistently
2. **Position Recovery**: Full sync on startup, intelligent exit scheduling
3. **Atomic Operations**: Orders and state changes are atomic
4. **Fail-Safe Defaults**: Conservative assumptions when data is missing
5. **Comprehensive Logging**: Every decision point is logged
6. **Graceful Degradation**: Partial failures don't crash the system
7. **Manual Override Safety**: Port 7496 (live trading) is blocked in code

**Testing Recommendations**

1. **Restart Testing**: Start system, open position, kill process, restart
2. **Date Rollover**: Run system from 11 PM to 1 AM local time
3. **Connection Loss**: Disconnect TWS while positions are open
4. **State Recovery**: Delete state file with open positions, verify sync
5. **Limit Testing**: Attempt to exceed daily/concurrent limits

This design ensures robust operation across all identified edge cases while maintaining strict risk controls.