**🏦 Complete ABS Document Processing System**

**📋 System Overview**

A comprehensive Asset-Backed Securities (ABS) document processing platform that handles the complete lifecycle from initial deal setup through ongoing surveillance monitoring, with integrated Bloomberg pricing data management.

**🎯 Core Capabilities**

**📄 Document Processing**

* **New Issue Reports**: Extract deal structure, note classes, financial terms
* **Surveillance Reports**: Process ongoing performance data, delinquencies, covenant compliance
* **Auto-Detection**: Automatically identifies document type based on content analysis
* **Enhanced Note Class Extraction**: Dynamic detection of A, A1, A2, B, C, etc. classes

**💹 Bloomberg Pricing Integration**

* **Weekly File Processing**: Upload Bloomberg Excel pricing sheets
* **Smart Duplicate Prevention**: Only adds new securities, prevents duplicates
* **Percentage Conversion**: Automatically converts percentages to 4-decimal precision decimals
* **Historical Tracking**: Maintains pricing history for trend analysis

**📊 Data Analytics**

* **Market Overview**: Total securities, deals, issuers, issuance volume
* **Visual Analytics**: Deal type distribution, yield patterns, credit support analysis
* **Interactive Filtering**: Filter by deal type, asset class, rating tier
* **Performance Charts**: Comprehensive trend analysis and visualization

**🗄️ Database Management**

* **Complete Schema**: Tracks deals, note classes, surveillance, pricing data
* **Query Builder**: Table-driven database queries
* **Export Functionality**: CSV downloads for all data sets
* **Data Integrity**: Foreign key relationships and validation

**🔧 Technical Architecture**

**Database Tables**

-- Core Deal Data

ABS\_Deals → Primary deal information

NoteClasses → Note class details and structure

SurveillanceReports → Performance monitoring data

NoteClassPerformance → Individual class performance tracking

-- Pricing Data

PricingData → Bloomberg pricing information

PricingHistory → Historical pricing trends

SavedSeries → Custom filter configurations

**Key Data Types**

* **Percentages**: Stored as decimals (25.7% → 0.2570) with 4 decimal precision
* **Dates**: Standardized YYYY-MM-DD format
* **Currency**: Consistent USD formatting with proper scaling
* **Text Fields**: Comprehensive string handling with pattern matching

**🎨 User Interface**

**Quadrant-Based Layout (Gradio-Style)**

┌─────────────────┬─────────────────┐

│ 📄 Document │ 📊 Analytics │

│ Processing │ Dashboard │

├─────────────────┼─────────────────┤

│ 💹 Bloomberg │ 🗄️ Database │

│ Pricing │ Explorer │

└─────────────────┴─────────────────┘

📋 Results Section

**Interactive Features**

* **Table-Driven Inputs**: All controls in editable data tables
* **Real-Time Processing**: Immediate feedback and validation
* **One-Screen Workflow**: No navigation required
* **Export Ready**: Download buttons for all data views

**📊 Bloomberg Pricing Specifications**

**Supported Columns**

Ticker → string

Issuer Name → string

Deal Name → string

CMO Class → string

Mtge Pricing Speed Date → datetime

First Sett Dt → datetime

Orig Amt → float

Mtge Deal Pricing Speed → float (decimal)

Deal Typ → string

Description - BN Reported → string

Strctd Prod Class Ast Subclas → string

144A Elig → string

Lead Manager 1 → string

Mtge Expected Mty Date → datetime

SEC Date (2a-7) → datetime

Benchmark (BBG News Created) → float

Issue Benchmark → string

Issue Spread to Benchmark → float

Issue Yield → float (decimal)

Cpn → float (decimal)

Issue Px → float

Original Credit Support (%) → float (decimal)

Current Credit Support (%) → float (decimal)

Orig WAL → float

Rating Tier → string

CUSIP → string

WAC → float (decimal)

**Percentage Handling**

* **Input**: "25.7%" or 25.7
* **Storage**: 0.2570 (4 decimal places)
* **Display**: 25.70% in UI

**🚀 Getting Started**

**Installation**

pip install streamlit pandas sqlite3 plotly numpy

**Running the System**

streamlit run complete\_abs\_system.py

**First Steps**

1. **Upload Documents**: Start with New Issue Reports or Surveillance Reports
2. **Process Bloomberg Data**: Upload weekly pricing Excel files
3. **Explore Analytics**: Use interactive charts and filters
4. **Query Database**: Build custom queries and export data

**📈 Workflow Examples**

**Weekly Bloomberg Update**

1. Upload new Bloomberg pricing Excel file
2. System automatically:
   * Identifies new securities
   * Converts percentages to decimals
   * Updates existing records
   * Maintains pricing history
3. View processing summary in table format

**Deal Analysis**

1. Upload New Issue Report
2. System extracts:
   * Deal structure and terms
   * Note class hierarchy
   * Financial parameters
   * Participant information
3. Review extracted data in results section

**Performance Monitoring**

1. Upload Surveillance Report
2. System processes:
   * Collection and performance data
   * Delinquency tracking
   * Covenant compliance
   * Note class performance
3. Generate trend charts and analytics

**🔍 Advanced Features**

**Custom Series Configuration**

* **Filter Criteria**: Save custom filter combinations
* **Format Settings**: Define column selections and sorting
* **One-Click Reports**: Generate filtered reports instantly
* **Export Ready**: Download configured series as CSV

**Analytics Capabilities**

* **Deal Type Analysis**: Distribution and volume patterns
* **Yield Analysis**: Distribution histograms and trends
* **Credit Support Correlation**: Yield vs enhancement scatter plots
* **Performance Tracking**: Historical trend analysis

**Query Builder**

* **Table Selection**: Choose from all database tables
* **Field Filtering**: Select specific columns and conditions
* **Export Options**: Direct CSV downloads
* **Real-Time Results**: Immediate query execution

**💾 Data Management**

**Storage Strategy**

* **SQLite Database**: Local file-based storage
* **Normalized Schema**: Efficient relational structure
* **History Tracking**: Complete audit trail
* **Backup Ready**: Portable database file

**Data Integrity**

* **Duplicate Prevention**: Ticker-based uniqueness
* **Foreign Keys**: Relational integrity
* **Validation**: Input sanitization and validation
* **Error Handling**: Comprehensive exception management

**🎯 Benefits**

**Efficiency Gains**

* **Single Interface**: All ABS operations in one system
* **Automated Processing**: Minimal manual intervention
* **Real-Time Analytics**: Immediate insights
* **Export Ready**: Professional reporting capabilities

**Data Quality**

* **Consistent Format**: Standardized data storage
* **Validation**: Automated error checking
* **History**: Complete transaction tracking
* **Precision**: 4-decimal percentage accuracy

**User Experience**

* **Gradio-Style**: Efficient quadrant layout
* **Table-Driven**: Familiar spreadsheet-like interface
* **One-Screen**: No navigation required
* **Professional**: Production-ready output

**🔧 Customization**

The system is designed for easy customization:

* **New Document Types**: Add extraction patterns
* **Additional Fields**: Extend database schema
* **Custom Analytics**: Add new chart types
* **Export Formats**: Integrate additional output formats

**📞 Support**

For technical issues or customization requests:

* Review error messages in the Results section
* Check console output for debugging information
* Verify file formats match specifications
* Ensure all required columns are present in Bloomberg files

**Version**: 1.0  
**Last Updated**: July 2025  
**Compatibility**: Streamlit 1.28+, Python 3.8+