Overview

The Patient Blood Pressure Report application is a clinical data management system designed to monitor and analyze patient blood pressure readings for healthcare environments. The application automatically processes patient blood pressure data from external files, identifies high-risk patients based on clinical thresholds, and generates comprehensive statistical reports and consultation documentation. It serves as a diagnostic tool that enables healthcare professionals to efficiently track patient cardiovascular health, prioritize cases requiring immediate medical attention, and maintain proper clinical documentation through automated report generation and data analysis capabilities.

Key Functionalities

- Launch Blood Pressure Monitoring Application with main interface and menu options
- Load Patient Blood Pressure Data from patient.txt file automatically
- Handle Data File Errors with clear error messages and recovery options
- Display Data Loading Progress with visual progress indicators
- Display Patient Information List with formatted names and blood pressure values
- Identify High-Risk Patients with systolic blood pressure over 120 mmHg
- Generate Consultation Reports automatically for high-risk patients
- View Statistical Summaries including average blood pressure and patient counts
- Navigate Application Options including main form return, data clearing, and exit

Activity 1: Monitor Patient Blood Pressure and Generate Clinical Reports

User Action 1: Launch Blood Pressure Monitoring Application

Description:
As a medical staff member, I want to launch the Patient Blood Pressure Report application so that I can access the main interface with current system date and menu options for patient data management.

- System displays the main form when the Patient Blood Pressure Report application is launched
- Current system date is automatically displayed on the main form interface
- Display Patient Information menu option is visible and accessible to medical staff

- Clear menu option is available for resetting the application state
- Exit menu option is provided for closing the application
- Timer is enabled to show progress feedback during data operations
- Application initializes StreamReader object for patient data file processing
- System checks for the existence of patient.txt file in the application directory
- File path and directory information are properly configured for patient data access

User Action 2: Load Patient Blood Pressure Data

Description:
As a medical staff member, I want the system to automatically load patient blood pressure data from the patient.txt file so that I can work with current patient information for analysis and reporting.

- System reads patient blood pressure data from patient.txt file when the file exists and is accessible
- System parses patient names and systolic blood pressure values from alternating lines in the file
- System stores patient names in shared array _strPatientName for application-wide access
- System stores systolic blood pressure values in shared array _intStolicValue for application-wide access
- System displays progress bar updating from 0 to 100% during data loading process
- System shows total number of patient records loaded after successful data import
- System displays error message when patient.txt file is not found or inaccessible
- System provides options to retry or exit when file loading fails
- System validates file format and converts systolic values to integer data type
- System enables navigation to Patient Information form after successful data loading

User Action 3: Handle Data File Errors

Description:
As a medical staff member, I want to receive clear error messages when patient data files are unavailable so that I can take appropriate action to resolve file access issues.

- System displays error message when patient.txt file is not found or inaccessible
- Error message includes the specific file path and location that could not be accessed
- Error message provides clear instruction to restart when the file becomes available
- System prevents further processing when patient data file is unavailable
- Medical staff can identify the exact cause of the file access failure from the error message
- System validates file existence before attempting to read patient data
- Error handling occurs immediately upon file access attempt without system crash

User Action 4: View Data Loading Progress

Description:
As a medical staff member, I want to see a progress indicator during data loading so that I can monitor the system's processing status and know when data is ready for analysis.

- System displays a progress bar that updates from 0 to 100% during patient data loading process
- Progress bar provides visual feedback to medical staff while patient.txt file is being read and processed
- System shows the total number of patient records loaded after data loading completes
- Progress indicator is enabled through a timer mechanism that tracks file processing status
- Medical staff can visually monitor that the system is actively processing patient data rather than appearing frozen
- System displays confirmation message showing exact count of patient records successfully loaded from the patient.txt file
- Progress bar automatically stops updating when data loading process is complete

User Action 5: Display Patient Information List

Description:
As a medical staff member, I want to view a formatted list of all patients with their names and systolic blood pressure values so that I can review the complete patient dataset.

- System presents all patient information in a formatted list showing patient names and corresponding systolic blood pressure values
- Patient information is displayed using custom Patient class formatting with proper alignment
- List displays patient names in the first column and systolic blood pressure values in the second column
- All loaded patient records from the patient data arrays are included in the displayed list
- Patient information list is populated after successful data loading from patient.txt file
- System uses tab-separated formatting to ensure proper column alignment in the display

User Action 6: Identify High-Risk Patients

Description:
As a medical staff member, I want the system to automatically identify patients with systolic blood pressure over 120 mmHg so that I can prioritize those requiring immediate medical consultation.

- System analyzes each patient's systolic blood pressure value against the clinical threshold of 120 mmHg
- System identifies patients with systolic blood pressure greater than 120 mmHg as high-risk cases requiring consultation
- System accumulates total systolic values for statistical calculations while processing each patient record
- System counts the number of high-risk patients identified during the analysis process
- System determines whether any high-risk patients exist in the current patient dataset
- System displays confirmation message showing the number of high-risk patients identified
- System provides clear indication when no high-risk patients are found in the current dataset

User Action 7: Generate Consultation Reports

Description:
As a medical staff member, I want the system to automatically create consultation reports for high-risk patients so that I can provide appropriate medical follow-up and documentation.

- System automatically creates consult.txt file when high-risk patients are identified
- System writes patient name and systolic blood pressure value to consultation report for each patient with systolic BP > 120 mmHg
- System validates successful file creation before writing consultation records
- System displays error message when consultation file cannot be created or accessed
- System writes consultation records line by line with patient name on first line and systolic value on second line
- System closes file writer properly after all high-risk patient records are written
- System displays confirmation message showing number of patient records written to consult.txt file
- System generates consultation report only for patients meeting high-risk criteria (systolic BP > 120 mmHg)
- System saves consultation file in the same directory as the patient data file

User Action 8: View Statistical Summaries

Description:
As a medical staff member, I want to view comprehensive statistics including average blood pressure, high-risk patient count, and total records processed so that I can make informed clinical decisions and track patient population health trends.

- System calculates average systolic blood pressure by dividing total systolic values by number of patients
- System rounds up the average blood pressure value using ceiling function for display
- System displays the count of high-risk patients with systolic BP greater than 120 mmHg
- System shows total number of patient records processed from the patient data file
- System displays number of patient records written to the consultation file

- Statistical summary includes average value label showing the calculated average blood pressure
- Statistical summary includes number of patients label showing high-risk patient count
- System makes statistical information visible to medical staff after data processing completes
- Statistics are calculated from accumulated totals during blood pressure analysis process

User Action 9: Navigate Application Options

Description:
As a medical staff member, I want access to navigation options including returning to main form, clearing data for restart, and exiting the application so that I can efficiently manage my workflow and system usage.

- System presents medical staff with navigation options after completing patient data analysis
- Medical staff can return to the main form to restart the workflow
- Medical staff can clear current data and restart the application for new patient data processing
- Medical staff can exit the application when workflow is complete
- System displays confirmation message showing number of patient records written to consultation file
- Navigation options remain accessible throughout the patient information analysis process
- System maintains workflow state when navigating between forms
- Exit option properly closes the application and releases system resources