**Discord Bot Automation Assistant**

**Discord Bot Automation Assistant Chapter 3**

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# CHAPTER THREE: PROJECT ORGANIZATION/STRUCTURE

This chapter covers the system design and implementation details of the Discord Bot Automation Assistant. We will start with the project requirements, including the use case diagram and descriptions of the use cases. Then, we will present the architecture, including UML component, deployment, and activity diagrams. The design section will include UML package and class diagrams. Finally, we will discuss the technology stack and frameworks used, followed by a short conclusion.

## Project Requirements (CISC695\_Assignment2 and CISC695\_Assignment3)

In this section, we will cover the project requirements, including the use case diagram and detailed descriptions of the use cases. We will also integrate relevant parts from assignments to provide a comprehensive understanding.

### Actors:

* **User**: The individual or entity utilizing the bot to manage tasks like website navigation, price monitoring, and system control.
* **Bot**: Handles commands, processes data, interacts with websites/APIs, and returns results. It operates within the Discord environment using various controls like browser control, price control, etc.
* **External Systems (Websites/APIs)**: Websites and APIs from which the bot fetches or interacts with data, such as retrieving product prices or checking availability.

### Use Cases:

#### Stop Bot (!stop\_bot)

* **Actor**: User
* **Description**: Allows the user to send a command to terminate the bot's operations immediately.
* **Preconditions**: Bot must be operational.
* **Trigger**: User sends the "!stop\_bot" command.
* **Main Flow**:
  1. User sends "!stop\_bot" command.
  2. Bot recognizes the command and proceeds to shut down.
  3. Bot confirms shutdown process and ceases all operations.
* **Postconditions**: Bot stops running, ceasing all active tasks and interactions.

#### Project Help (!project\_help)

* **Actor**: User
* **Description**: Provides the user with a list of available commands and descriptions on how to use them.
* **Preconditions**: Bot must be operational and accessible to the user.
* **Trigger**: User sends the "!project\_help" command.
* **Main Flow**:
  1. User requests help by sending "!project\_help".
  2. Bot receives the command and fetches a list of all usable commands along with descriptions.
  3. Bot displays the command list to the user.
* **Postconditions**: User receives the information needed to utilize the bot effectively.

#### Navigate to Website (!navigate\_to\_website)

* **Actor**: User
* **Description**: Enables the user to command the bot to open a web browser and navigate to a specified URL.
* **Preconditions**: Bot must be operational.
* **Trigger**: User sends the "!navigate\_to\_website [URL]" command.
* **Main Flow**:
  1. User inputs the command with a URL.
  2. Bot recognizes the command and extracts the URL.
  3. Bot launches the web browser and navigates to the specified URL.
  4. Bot confirms navigation success to the user.
* **Postconditions**: The browser is opened at the desired web page.

#### Close Browser (!close\_browser)

* **Actor**: User
* **Description**: Allows the user to send a command to the bot to close the currently opened web browser.
* **Preconditions**: A web browser must be opened by the bot.
* **Trigger**: User sends the "!close\_browser" command.
* **Main Flow**:
  1. User sends the command to close the browser.
  2. Bot receives the command and proceeds to close any open browsers.
  3. Bot confirms the closure of the browser.
* **Postconditions**: Any browser opened by the bot is closed.

#### Login to a Website (!login)

* **Actor**: User
* **Description**: Enables the user to command the bot to log into a web application using provided credentials.
* **Preconditions**: The target website's login page is accessible.
* **Trigger**: User sends the "!login [website] [username] [password]" command.
* **Main Flow**:
  1. User inputs the command with website URL, username, and password.
  2. Bot recognizes the command, extracts the details, and navigates to the login page of the website.
  3. Bot inputs the credentials and attempts to log in.
  4. Bot confirms to the user whether the login was successful or if there were any errors.
* **Postconditions**: User is logged into the website if credentials are correct and the website is reachable.

#### Receive Email (!receive\_email)

* **Actor**: User
* **Description**: Commands the bot to send an email with an attached file specified by the user.
* **Preconditions**: Bot must be operational, and the specified file must be present in the system.
* **Trigger**: User sends the "!receive\_email [file\_name]" command with a valid file name.
* **Main Flow**:
  1. User inputs the command with the name of the file to be emailed (e.g., "!receive\_email fileToEmail.html").
  2. Bot recognizes the command and verifies the presence of the file in the system.
  3. Bot attaches the file to an email and sends it to a predetermined recipient.
  4. Bot confirms to the user that the email has been sent successfully or informs them of any issues encountered (e.g., file not found or email delivery failure).
* **Postconditions**: The email is sent with the specified attachment if all conditions are met.

#### Get Price (!get\_price)

* **Actor**: User
* **Description**: Retrieves the current price of a product from a specified URL and logs this information to an Excel or HTML file.
* **Preconditions**: Bot must be operational, and the URL must be accessible.
* **Trigger**: User sends the "!get\_price [URL]" command.
* **Main Flow**:
  1. User sends a command with the URL of the product.
  2. Bot recognizes the command, retrieves the current price from the specified URL using web scraping.
  3. Bot logs the price retrieval event to an Excel and HTML file.
  4. Bot displays the price to the user.
* **Postconditions**: The price is displayed to the user and data is logged.

#### Start Monitoring Price (!start\_monitoring\_price)

* **Actor**: User
* **Description**: Initiates an ongoing process to monitor price changes at a specified URL, alerting the user via email if there are price changes.
* **Preconditions**: Bot must be operational, and the URL must be accessible.
* **Trigger**: User sends the "!start\_monitoring\_price [URL] [frequency]" command.
* **Main Flow**:
  1. User specifies the URL and frequency of checks.
  2. Bot begins monitoring the price at the given URL at the specified frequency.
  3. For each check, the bot calls the "!get\_price" command to log the current price and check for changes.
  4. The bot sends the saved document as an email.
  5. Bot continues to monitor until the "!stop\_monitoring\_price" command is issued.
* **Postconditions**: Price monitoring is active, logs are being created at each interval, and emails are sent on price changes.

#### Stop Monitoring Price (!stop\_monitoring\_price)

* **Actor**: User
* **Description**: Terminates an ongoing price monitoring process and provides a summary of the results.
* **Preconditions**: Price monitoring process must be active.
* **Trigger**: User sends the "!stop\_monitoring\_price" command.
* **Main Flow**:
  1. User sends the command to stop monitoring.
  2. Bot receives the command and terminates the ongoing price monitoring.
  3. Bot provides a final summary of monitoring results to the user using the array of results collected during monitoring.
* **Postconditions**: Price monitoring is ceased, and final results are reported to the user.

#### Check Availability (!check\_availability)

* **Actor**: User
* **Description**: Checks the availability of a reservation or booking at a specified URL and logs this information to an Excel or HTML file.
* **Preconditions**: Bot must be operational, and the URL must be accessible.
* **Trigger**: User sends the "!check\_availability [URL]" command.
* **Main Flow**:
  1. User sends a command with the URL where the availability needs to be checked.
  2. Bot recognizes the command, retrieves availability data from the specified URL using web scraping.
  3. Bot logs the availability check event to an Excel and HTML file.
  4. Bot displays the availability status to the user.
* **Postconditions**: The availability status is displayed to the user and data is logged.

#### Start Monitoring Availability (!start\_monitoring\_availability)

* **Actor**: User
* **Description**: Initiates an ongoing process to monitor changes in availability at a specified URL, alerting the user via email if there are changes in availability.
* **Preconditions**: Bot must be operational, and the URL must be accessible.
* **Trigger**: User sends the "!start\_monitoring\_availability [URL] [frequency]" command.
* **Main Flow**:
  1. User specifies the URL and frequency of checks.
  2. Bot begins monitoring the availability at the given URL at the specified frequency.
  3. For each check, the bot calls the "!check\_availability" command to log the current availability and check for changes.
  4. If an availability change is detected, the bot sends an email with the updated availability information.
  5. Bot continues to monitor until the "!stop\_monitoring\_availability" command is issued.
* **Postconditions**: Availability monitoring is active, logs are being created at each interval, and emails are sent on availability changes.

#### Stop Monitoring Availability (!stop\_monitoring\_availability)

* **Actor**: User
* **Description**: Terminates an ongoing availability monitoring process and provides a summary of the results.
* **Preconditions**: Availability monitoring process must be active.
* **Trigger**: User sends the "!stop\_monitoring\_availability" command.
* **Main Flow**:
  1. User sends the command to stop monitoring.
  2. Bot receives the command and terminates the ongoing availability monitoring.
  3. Bot provides a final summary of monitoring results to the user using the array of results collected during monitoring.
* **Postconditions**: Availability monitoring is ceased, and final results are reported to the user.

### UML use case diagram

@startuml

left to right direction

skinparam packageStyle rectangle

skinparam actorStyle awesome

' Define actors

actor User #lightblue

actor "External Helpers" as ExternalHelpers #pink

' Define system and packages

package "Discord Bot System" {

' Define use cases

usecase "ChatWithBot" as ChatWithBot

package "BrowserOperations" {

usecase "Navigate to Website" as NavigateWebsite

usecase "Login to Website" as LoginWebsite

usecase "Close Browser" as CloseBrowser

}

package "MonitoringOperations" {

usecase "Check Availability" as CheckAvailability

usecase "Start Monitoring Availability" as StartMonitoringAvailability

usecase "Stop Monitoring Availability" as StopMonitoringAvailability

usecase "Get Price" as GetPrice

usecase "Start Monitoring Price" as StartMonitoringPrice

usecase "Stop Monitoring Price" as StopMonitoringPrice

}

package "NotificationOperations" {

usecase "Receive Email" as ReceiveEmail

}

' Positioning for visual alignment

BrowserOperations -[hidden]d- MonitoringOperations

MonitoringOperations -[hidden]d- NotificationOperations

}

' User interactions with initial use case

User -left-> ChatWithBot

User -left-> NavigateWebsite

User -left-> LoginWebsite

User -left-> CloseBrowser

User -left-> GetPrice

User -left-> CheckAvailability

User -left-> StartMonitoringPrice

User -left-> StopMonitoringPrice

User -left-> StartMonitoringAvailability

User -left-> StopMonitoringAvailability

User -left-> ReceiveEmail

' Package extending relationships

ChatWithBot .right-> BrowserOperations : <<extend>>

BrowserOperations .down-> MonitoringOperations : <<extend>>

MonitoringOperations .down-> NotificationOperations : <<extend>>

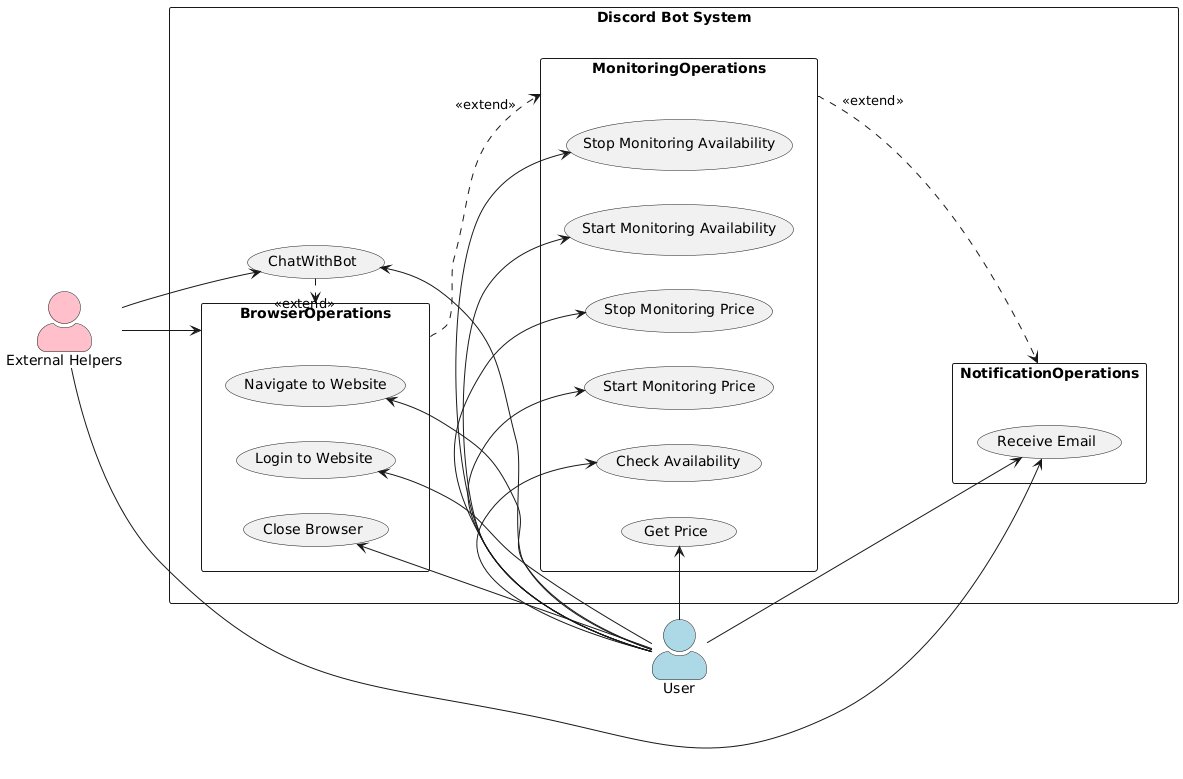
' External interactions aligned to the right

ExternalHelpers --> BrowserOperations

ExternalHelpers --> ReceiveEmail

ExternalHelpers --> ChatWithBot

@enduml



## Architecture ()

**Data Flow and Interaction**

When a user types a command in Discord, the message is captured by the appropriate Boundary object. The command is parsed and sent to the relevant Control object. The Control then processes the command, interacting with the Entity objects if data retrieval or manipulation is needed. After processing, the results are sent back through the control to the boundary, which then communicates the outcome to the user on Discord