

```
--- main.py ---
```

```
from utils.MyBot import start_bot
```

```
from utils.Config import Config
```

```
# Initialize and run the bot
```

```
if __name__ == "__main__":
```

```
    print("Bot is starting...")
```

```
    start_bot(Config.DISCORD_TOKEN) # Start the bot using the token from config
```

```
--- AccountBoundary.py ---
```

```
from discord.ext import commands
```

```
from control.AccountControl import AccountControl
```

```
from DataObjects.global_vars import GlobalState
```

```
class AccountBoundary(commands.Cog):
```

```
    def __init__(self):
```

```
        self.control = AccountControl() # Initialize control object
```

```
    @commands.command(name="fetch_all_accounts")
```

```
    async def fetch_all_accounts(self, ctx):
```

```
        await ctx.send("Command recognized, passing data to control.")
```

```
        list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into  
command and up to 6 variables
```

```
        command = list[0] # First element is the command
```

```
result = self.control.receive_command(command)
```

```
# Send the result (prepared by control) back to the user
```

```
await ctx.send(result)
```

```
@commands.command(name="fetch_account_by_website")
```

```
async def fetch_account_by_website(self, ctx):
```

```
    list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into  
command and up to 6 variables
```

```
    command = list[0] # First element is the command
```

```
    website = list[1] # Second element is the URL
```

```
    await ctx.send(f"Command recognized, passing data to control for website {website}.")
```

```
    result = self.control.receive_command(command, website)
```

```
# Send the result (prepared by control) back to the user
```

```
await ctx.send(result)
```

```
@commands.command(name="add_account")
```

```
async def add_account(self, ctx):
```

```
    await ctx.send("Command recognized, passing data to control.")
```

```
    list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into  
command and up to 6 variables
```

```
command = list[0] # First element is the command
```

```
username = list[1] # Second element is the username
```

```
password = list[2] # Third element is the password
```

```
website = list[3] # Third element is the website
```

```
result = self.control.receive_command(command, username, password, website)
```

```
# Send the result (prepared by control) back to the user
```

```
await ctx.send(result)
```

```
@commands.command(name="delete_account")
```

```
async def delete_account(self, ctx):
```

```
    list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into  
command and up to 6 variables
```

```
    command = list[0] # First element is the command
```

```
    account_id = list[1] # Second element is the account_id
```

```
    await ctx.send(f"Command recognized, passing data to control to delete account with ID  
{account_id}.")
```

```
    result = self.control.receive_command(command, account_id)
```

```
# Send the result (prepared by control) back to the user
```

```
await ctx.send(result)
```

--- AvailabilityBoundary.py ---

```
from discord.ext import commands
```

```
from control.AvailabilityControl import AvailabilityControl
```

```
from DataObjects.global_vars import GlobalState
```

```
class AvailabilityBoundary(commands.Cog):
```

```
    def __init__(self):
```

```
        # Initialize control objects directly
```

```
        self.availability_control = AvailabilityControl()
```

```
    @commands.command(name="check_availability")
```

```
    async def check_availability(self, ctx):
```

```
        await ctx.send("Command recognized, passing data to control.")
```

```
        list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into  
command and up to 6 variables
```

```
        command = list[0] # First element is the command
```

```
        url = list[1] # Second element is the URL
```

```
        date_str = list[2] # Third element is the date
```

```
        # Pass the command and data to the control layer using receive_command
```

```
        result = await self.availability_control.receive_command(command, url, date_str)
```

```
# Send the result back to the user
```

```
await ctx.send(result)
```

```
@commands.command(name="start_monitoring_availability")
```

```
async def start_monitoring_availability(self, ctx):
```

```
    await ctx.send("Command recognized, passing data to control.")
```

```
    list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into  
command and up to 6 variables
```

```
    command = list[0] # First element is the command
```

```
    url = list[1] # Second element is the URL
```

```
    date_str = list[2] # Third element is the date
```

```
    frequency = list[3] # Fourth element is the frequency
```

```
    response = await self.availability_control.receive_command(command, url, date_str, frequency)
```

```
# Send the result back to the user
```

```
await ctx.send(response)
```

```
@commands.command(name='stop_monitoring_availability')
```

```
async def stop_monitoring_availability(self, ctx):
```

```
    """Command to stop monitoring the price."""
```

```
    await ctx.send("Command recognized, passing data to control.")
```

```
list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into
command and up to 6 variables
```

```
command = list[0] # First element is the command
```

```
response = await self.availability_control.receive_command(command) # Pass the
command to the control layer
await ctx.send(response)
```

```
--- BotBoundary.py ---
```

```
from discord.ext import commands
```

```
from control.BotControl import BotControl
```

```
from DataObjects.global_vars import GlobalState
```

```
class BotBoundary(commands.Cog):
```

```
    def __init__(self):
```

```
        self.control = BotControl() # Initialize control object
```

```
    @commands.command(name="project_help")
```

```
    async def project_help(self, ctx):
```

```
        """Handle help command by sending available commands to the user."""
```

```
        await ctx.send("Command recognized, passing data to control.")
```

```
        try:
```

```
            list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message
into command and up to 6 variables
```

```
            command = list[0] # First element is the command
```

```

        response = await self.control.receive_command(command) # Call control layer

        await ctx.send(response) # Send the response back to the user

    except Exception as e:

        error_msg = f"Error in HelpBoundary: {str(e)}"

        print(error_msg)

        await ctx.send(error_msg)

@commands.command(name="stop_bot")

async def stop_bot(self, ctx):

    """Handle stop bot command by shutting down the bot."""

    await ctx.send("Command recognized, passing data to control.")

    try:

        list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message
into command and up to 6 variables

        command = list[0] # First element is the command

        result = await self.control.receive_command(command, ctx) # Call control layer to stop the
bot

        print(result) # Send the result to the terminal since the bot will shut down

    except Exception as e:

        error_msg = f"Error in StopBoundary: {str(e)}"

        print(error_msg)

        await ctx.send(error_msg)

```

--- BrowserBoundary.py ---

```

from discord.ext import commands

from control.BrowserControl import BrowserControl

from DataObjects.global_vars import GlobalState


class BrowserBoundary(commands.Cog):

    def __init__(self):

        self.browser_control = BrowserControl() # Initialize Browser control object


    # Browser-related commands

    @commands.command(name='launch_browser')

    async def launch_browser(self, ctx):

        await ctx.send(f"Command recognized, passing to control object.")


        list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into
command and up to 6 variables

        command = list[0] # First element is the command


        result = await self.browser_control.receive_command(command) # Pass the updated
user_message to the control object

        await ctx.send(result) # Send the result back to the user


    @commands.command(name="close_browser")

    async def close_browser(self, ctx):

        await ctx.send(f"Command recognized, passing to control object.")


        list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into
command and up to 6 variables

```



```
command = list[0] # First element is the command
```

```
result = await self.browser_control.receive_command(command)
```

```
await ctx.send(result)
```

```
# Login-related commands
```

```
@commands.command(name='login')
```

```
async def login(self, ctx):
```

```
    await ctx.send("Command recognized, passing data to control.")
```

```
list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into  
command and up to 6 variables
```

```
command = list[0] # First element is the command
```

```
website = list[1]
```

```
result = await self.browser_control.receive_command(command, website) # Pass the  
command and website to control object
```

```
# Send the result back to the user
```

```
await ctx.send(result)
```

```
# Navigation-related commands
```

```
@commands.command(name='navigate_to_website')
```

```
async def navigate_to_website(self, ctx):
```

```
    await ctx.send("Command recognized, passing the data to control object.") # Inform the user  
that the command is recognized
```

```
list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into
command and up to 6 variables
```

```
command = list[0] # First element is the command
```

```
website = list[1] # Second element is the URL
```

```
result = await self.browser_control.receive_command(command, website) # Pass the parsed
variables to the control object
```

```
await ctx.send(result) # Send the result back to the user
```

```
--- PriceBoundary.py ---
```

```
from discord.ext import commands
```

```
from control.PriceControl import PriceControl
```

```
from DataObjects.global_vars import GlobalState
```

```
class PriceBoundary(commands.Cog):
```

```
    def __init__(self):
```

```
        # Initialize control objects directly
```

```
        self.price_control = PriceControl()
```

```
    @commands.command(name='get_price')
```

```
    async def get_price(self, ctx):
```

```
        """Command to get the price from the given URL."""
```

```
        await ctx.send("Command recognized, passing data to control.")
```

```
list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into
```

command and up to 6 variables

```
command = list[0] # First element is the command
```

```
website = list[1] # Second element is the URL
```

```
result = await self.price_control.receive_command(command, website) # Pass the command to  
the control layer
```

```
await ctx.send(f"Price found: {result}")
```

```
@commands.command(name='start_monitoring_price')
```

```
async def start_monitoring_price(self, ctx):
```

```
    """Command to monitor price at given frequency."""
```

```
    list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into
```

command and up to 6 variables

```
command = list[0] # First element is the command
```

```
website = list[1] # Second element is the URL
```

```
frequency = list[2]
```

```
await ctx.send(f"Command recognized, starting price monitoring at {website} every {frequency}  
second(s).")
```

```
response = await self.price_control.receive_command(command, website, frequency)
```

```
await ctx.send(response)
```

```
@commands.command(name='stop_monitoring_price')
```

```
async def stop_monitoring_price(self, ctx):
```

```
"""Command to stop monitoring the price."""
```

```
await ctx.send("Command recognized, passing data to control.")
```

```
list = GlobalState.parse_user_message(GlobalState.user_message) # Parse the message into  
command and up to 6 variables
```

```
command = list[0] # First element is the command
```

```
response = await self.price_control.receive_command(command) # Pass the command  
to the control layer
```

```
await ctx.send(response)
```

```
--- __init__.py ---
```

```
#empty init file
```

```
--- AccountControl.py ---
```

```
from DataObjects.AccountDAO import AccountDAO
```

```
class AccountControl:
```

```
    def __init__(self):
```

```
        self.account_dao = AccountDAO() # DAO for database operations
```

```
    def receive_command(self, command, *args):
```

```
        """Handle all account-related commands and process business logic."""
```

```
        print("Data received from boundary:", command)
```

```
if command == "fetch_all_accounts":
```

```
    return self.fetch_all_accounts()
```

```
elif command == "fetch_account_by_website":
```

```
    website = args[0] if args else None
```

```
    return self.fetch_account_by_website(website)
```

```
elif command == "add_account":
```

```
    username, password, website = args if args else (None, None, None)
```

```
    return self.add_account(username, password, website)
```

```
elif command == "delete_account":
```

```
    account_id = args[0] if args else None
```

```
    return self.delete_account(account_id)
```

```
else:
```

```
    result = "Invalid command."
```

```
    print(result)
```

```
    return result
```

```
def add_account(self, username: str, password: str, website: str):
```

```
    """Add a new account to the database."""
```

```
    self.account_dao.connect()
```

```
    result = self.account_dao.add_account(username, password, website)
```

```
    self.account_dao.close()
```

```
    result_message = f"Account for {website} added successfully." if result else f"Failed to add
```

account for {website}."

```
print(result_message)
```

```
return result_message
```

```
def delete_account(self, account_id: int):
```

```
    """Delete an account by ID."""
```

```
    self.account_dao.connect()
```

```
    try:
```

```
        result = self.account_dao.delete_account(account_id)
```

```
    except Exception as e:
```

```
        print(f"Error deleting account: {e}")
```

```
        return "Error deleting account."
```

```
    self.account_dao.reset_id_sequence()
```

```
    self.account_dao.close()
```

```
    result_message = f"Account with ID {account_id} deleted successfully." if result else f"Failed to  
delete account with ID {account_id}."
```

```
    print(result_message)
```

```
    return result_message
```

```
def fetch_all_accounts(self):
```

```
    """Fetch all accounts using the DAO."""
```

```
    self.account_dao.connect()
```

```
    try:
```

```
        accounts = self.account_dao.fetch_all_accounts()
```

```
    except Exception as e:
```

```
        return "Error fetching accounts."
```

```

self.account_dao.close()

if accounts:

    account_list = "\n".join([f"ID: {acc[0]}, Username: {acc[1]}, Password: {acc[2]}, Website:
{acc[3]}" for acc in accounts])

    result_message = f"Accounts:\n{account_list}"

else:

    result_message = "No accounts found."

print(result_message)

return result_message

def fetch_account_by_website(self, website: str):

    """Fetch an account by website."""

    try:

        self.account_dao.connect()

        account = self.account_dao.fetch_account_by_website(website)

        self.account_dao.close()

        # Logic to format the result within the control layer

        if account:

            return account

        else:

            return f"No account found for {website}."

    except Exception as e:

        return f"Error: {str(e)}"

```

```
--- AvailabilityControl.py ---
```

```
import asyncio
```

```
from entity.AvailabilityEntity import AvailabilityEntity
```

```
from datetime import datetime
```

```
from utils.css_selectors import Selectors
```

```
class AvailabilityControl:
```

```
    def __init__(self):
```

```
        self.availability_entity = AvailabilityEntity() # Initialize the entity
```

```
        self.is_monitoring = False # Monitor state
```

```
        self.results = [] # List to store monitoring results
```

```
    async def receive_command(self, command_data, *args):
```

```
        """Handle all commands related to availability."""
```

```
        print("Data received from boundary:", command_data)
```

```
        if command_data == "check_availability":
```

```
            url = args[0]
```

```
            date_str = args[1] if len(args) > 1 else None
```

```
            return await self.check_availability(url, date_str)
```

```
        elif command_data == "start_monitoring_availability":
```

```
            url = args[0]
```

```
            date_str = args[1] if len(args) > 1 else None
```

```
            frequency = args[2] if len(args) > 2 and args[2] not in [None, ""] else 15
```



```
return await self.start_monitoring_availability(url, date_str, frequency)
```

```
elif command_data == "stop_monitoring_availability":
```

```
    return self.stop_monitoring_availability()
```

```
else:
```

```
    print("Invalid command.")
```

```
    return "Invalid command."
```

```
async def check_availability(self, url: str, date_str=None):
```

```
    """Handle availability check and export results."""
```

```
    print("Checking availability...")
```

```
    # Call the entity to check availability
```

```
    try:
```

```
        if not url:
```

```
            selectors = Selectors.get_selectors_for_url("opentable")
```

```
            url = selectors.get('availableUrl')
```

```
            if not url:
```

```
                return "No URL provided, and default URL for openTable could not be found."
```

```
            print("URL not provided, default URL for openTable is: " + url)
```

```
        availability_info = await self.availability_entity.check_availability(url, date_str)
```

```
    # Prepare the result
```

```
    result = f"Checked availability: {availability_info}"
```

```
except Exception as e:
```

```
        result = f"Failed to check availability: {str(e)}"

    print(result)
```

```
# Create a DTO (Data Transfer Object) for export
```

```
data_dto = {

    "command": "check_availability",

    "url": url,

    "result": result,

    "entered_date": datetime.now().strftime('%Y-%m-%d'),

    "entered_time": datetime.now().strftime('%H:%M:%S')

}
```

```
# Export data to Excel/HTML via the entity
```

```
self.availability_entity.export_data(data_dto)

return result
```

```
async def start_monitoring_availability(self, url: str, date_str=None, frequency=15):
```

```
    """Start monitoring availability at a specified frequency."""
```

```
    print("Monitoring availability")
```

```
    if self.is_monitoring:
```

```
        result = "Already monitoring availability."
```

```
        print(result)
```

```
        return result
```

```
self.is_monitoring = True # Set monitoring to active
```

```
try:
```

```
while self.is_monitoring:
```

```
    # Call entity to check availability
```

```
    result = await self.check_availability(url, date_str)
```

```
    self.results.append(result) # Store the result in the list
```

```
    await asyncio.sleep(frequency) # Wait for the specified frequency before checking again
```

```
except Exception as e:
```

```
    error_message = f"Failed to monitor availability: {str(e)}"
```

```
    print(error_message)
```

```
    return error_message
```

```
return self.results
```

```
def stop_monitoring_availability(self):
```

```
    """Stop monitoring availability."""
```

```
    print("Stopping availability monitoring...")
```

```
    result = None
```

```
    try:
```

```
        if not self.is_monitoring:
```

```
            # If no monitoring session is active
```

```
            result = "There was no active availability monitoring session. Nothing to stop."
```

```
        else:
```

```
            # Stop monitoring and collect results
```

```
            self.is_monitoring = False
```

```
            result = "Results for availability monitoring:\n"
```

```
            result += "\n".join(self.results)
```

```

        result = result + "\n" + "\nMonitoring stopped successfully!"

    print(result)

except Exception as e:

    # Handle any error that occurs

    result = f"Error stopping availability monitoring: {str(e)}"


return result

```

--- BotControl.py ---

```
import discord
```

```
class BotControl:
```

```
    async def receive_command(self, command_data, ctx=None):
```

```
        """Handle commands related to help and stopping the bot."""
```

```
        print("Data received from boundary:", command_data)
```

```
        # Handle help commands
```

```
        if command_data == "project_help":
```

```
            try:
```

```
                help_message = (
```

```
                    "Here are the available commands:\n"
```

```
                    "!project_help - Get help on available commands.\n"
```

```
                    "!fetch_all_accounts - Fetch all stored accounts.\n"
```

```
                    "!add_account 'username' 'password' 'website' - Add a new account to the database.\n"
```

```
                    "!fetch_account_by_website 'website' - Fetch account details by website.\n"
```

```

"!delete_account 'account_id' - Delete an account by its ID.\n"

"!launch_browser - Launch the browser.\n"

"!close_browser - Close the browser.\n"

"!navigate_to_website 'url' - Navigate to a specified website.\n"

"!login 'website' - Log in to a website (e.g., !login bestbuy).\n"

"!get_price 'url' - Check the price of a product on a specified website.\n"

"!start_monitoring_price 'url' 'frequency' - Start monitoring a product's price at a specific
interval (frequency in minutes).\n"

"!stop_monitoring_price - Stop monitoring the product's price.\n"

"!check_availability 'url' - Check availability for a restaurant or service.\n"

"!start_monitoring_availability 'url' 'frequency' - Monitor availability at a specific
interval.\n"

"!stop_monitoring_availability - Stop monitoring availability.\n"

"!stop_bot - Stop the bot.\n"

)

return help_message

except Exception as e:

    error_msg = f"Error handling help command: {str(e)}"

    print(error_msg)

    return error_msg


# Handle stop bot commands

elif command_data == "stop_bot" and ctx is not None:

    try:

        bot = ctx.bot # Get the bot instance from the context

        await ctx.send("The bot is shutting down...")

        print("Bot is shutting down...")

```

```

        await bot.close() # Close the bot

        result = "Bot has been shut down."

        print(result)

        return result

    except Exception as e:

        error_msg = f"Error shutting down the bot: {str(e)}"

        print(error_msg)

        return error_msg

```

# Default response for invalid commands

else:

try:

return "Invalid command."

except Exception as e:

error\_msg = f"Error handling invalid command: {str(e)}"

print(error\_msg)

return error\_msg

--- BrowserControl.py ---

from entity.BrowserEntity import BrowserEntity

from control.AccountControl import AccountControl # Needed for LoginControl

from utils.css\_selectors import Selectors # Used in both LoginControl and NavigationControl

import re # Used for URL pattern matching in LoginControl

class BrowserControl:

def \_\_init\_\_(self):

```
self.browser_entity = BrowserEntity() # Initialize the entity object inside the control layer

self.account_control = AccountControl() # Manages account data for login use case
```

```
# Browser-related command handler
```

```
async def receive_command(self, command_data, site=None, url=None):
```

```
    print("Data Received from boundary object: ", command_data)
```

```
# Handle browser commands
```

```
if command_data == "launch_browser":
```

```
    try:
```

```
        result = self.browser_entity.launch_browser()
```

```
        return f"Control Object Result: {result}"
```

```
    except Exception as e:
```

```
        return f"Control Layer Exception: {str(e)}"
```

```
elif command_data == "close_browser":
```

```
    try:
```

```
        result = self.browser_entity.close_browser()
```

```
        return f"Control Object Result: {result}"
```

```
    except Exception as e:
```

```
        return f"Control Layer Exception: {str(e)}"
```

```
# Handle login commands
```

```
elif command_data == "login" and site:
```

```
    try:
```

```
        # Fetch account credentials from the account control
```

```
        account_info = self.account_control.fetch_account_by_website(site)
```

```

if not account_info:

    return f"No account found for {site}"

username, password = account_info[0], account_info[1]

print(f"Username: {username}, Password: {password}")

# Improved regex to detect URLs even without http/https
url_pattern = re.compile(r'(https?://)?(www\.)?(\w+)(\.\w{2,})')

# Check if the input is a full URL or a site name
if url_pattern.search(site):

    # If it contains a valid domain pattern, treat it as a URL

    if not site.startswith('http'):

        # Add 'https://' if the URL does not include a protocol

        url = f"https://{site}"

    else:

        url = site

    print(f"Using provided URL: {url}")

else:

    # If not a URL, look it up in the CSS selectors

    selectors = Selectors.get_selectors_for_url(site)

    if not selectors or 'url' not in selectors:

        return f"URL for {site} not found."

    url = selectors.get('url')

    print(f"URL from selectors: {url}")

if not url:

```



```
return f"URL for {site} not found."
```

```
result = await self.browser_entity.login(url, username, password)
```

```
return f"Control Object Result: {result}"
```

```
except Exception as e:
```

```
return f"Control Layer Exception: {str(e)}"
```

```
# Handle navigation commands
```

```
elif command_data == "navigate_to_website" and site:
```

```
url_pattern = re.compile(r'(https?://)?(www\.)?(\w+)(\.\w{2,})')
```

```
# Check if the input is a full URL or a site name
```

```
if url_pattern.search(site):
```

```
    # If it contains a valid domain pattern, treat it as a URL
```

```
    if not site.startswith('http'):
```

```
        # Add 'https://' if the URL does not include a protocol
```

```
        url = f"https://{site}"
```

```
    else:
```

```
        url = site
```

```
    print(f"Using provided URL: {url}")
```

```
else:
```

```
    # If not a URL, look it up in the CSS selectors
```

```
    selectors = Selectors.get_selectors_for_url(site)
```

```
    if not selectors or 'url' not in selectors:
```

```
        return f"URL for {site} not found."
```

```
    url = selectors.get('url')
```

```
print("URL not provided, default URL for Google is: " + url)
```

```
try:
```

```
    result = self.browser_entity.navigate_to_website(url)
```

```
    return f"Control Object Result: {result}"
```

```
except Exception as e:
```

```
    return f"Control Layer Exception: {str(e)}"
```

```
else:
```

```
    return "Invalid command."
```

```
--- PriceControl.py ---
```

```
import asyncio
```

```
from datetime import datetime
```

```
from entity.PriceEntity import PriceEntity
```

```
from utils.css_selectors import Selectors
```

```
class PriceControl:
```

```
    def __init__(self):
```

```
        self.price_entity = PriceEntity() # Initialize PriceEntity for fetching and export
```

```
        self.is_monitoring = False # Monitoring flag
```

```
        self.results = [] # Store monitoring results
```

```
    async def receive_command(self, command_data, *args):
```

```
        """Handle all price-related commands and process business logic."""
```

```
print("Data received from boundary:", command_data)
```

```
if command_data == "get_price":
```

```
    url = args[0] if args else None
```

```
    return await self.get_price(url)
```

```
elif command_data == "start_monitoring_price":
```

```
    url = args[0] if args else None
```

```
    frequency = args[1] if len(args) > 1 and args[1] not in [None, ""] else 20
```

```
    return await self.start_monitoring_price(url, frequency)
```

```
elif command_data == "stop_monitoring_price":
```

```
    return self.stop_monitoring_price()
```

```
else:
```

```
    return "Invalid command."
```

```
async def get_price(self, url: str):
```

```
    """Handle fetching the price from the entity."""
```

```
    print("getting price...")
```

```
    try:
```

```
        if not url:
```

```
            selectors = Selectors.get_selectors_for_url("bestbuy")
```

```
            url = selectors.get('priceUrl')
```

```
        if not url:
```

```
            return "No URL provided, and default URL for BestBuy could not be found."
```

```
print("URL not provided, default URL for BestBuy is: " + url)
```

```
# Fetch the price from the entity
```

```
result = self.price_entity.get_price_from_page(url)
```

```
print(f"Price found: {result}")
```

```
data_dto = {
```

```
    "command": "monitor_price",
```

```
    "url": url,
```

```
    "result": result,
```

```
    "entered_date": datetime.now().strftime('%Y-%m-%d'),
```

```
    "entered_time": datetime.now().strftime('%H:%M:%S')
```

```
}
```

```
# Pass the DTO to PriceEntity to handle export
```

```
self.price_entity.export_data(data_dto)
```

```
except Exception as e:
```

```
    return f"Failed to fetch price: {str(e)}"
```

```
return result
```

```
async def start_monitoring_price(self, url: str, frequency=20):
```

```
    """Start monitoring the price at a given interval."""
```

```
    print("Starting price monitoring...")
```

```
    try:
```

```
if self.is_monitoring:
```

```
    return "Already monitoring prices."
```

```
self.is_monitoring = True
```

```
previous_price = None
```

```
while self.is_monitoring:
```

```
    current_price = await self.get_price(url)
```

```
    # Determine price changes and prepare the result
```

```
    result = ""
```

```
    if current_price:
```

```
        if previous_price is None:
```

```
            result = f"Starting price monitoring. Current price: {current_price}"
```

```
        elif current_price > previous_price:
```

```
            result = f"Price went up! Current price: {current_price} (Previous: {previous_price})"
```

```
        elif current_price < previous_price:
```

```
            result = f"Price went down! Current price: {current_price} (Previous: {previous_price})"
```

```
        else:
```

```
            result = f"Price remains the same: {current_price}"
```

```
            previous_price = current_price
```

```
    else:
```

```
        result = "Failed to retrieve the price."
```

```
    # Add the result to the results list
```

```
    self.results.append(result)
```

```
    await asyncio.sleep(frequency)
```

```
except Exception as e:
```

```
    self.results.append(f"Failed to monitor price: {str(e)}")
```

```
def stop_monitoring_price(self):
```

```
    """Stop the price monitoring loop."""
```

```
    print("Stopping price monitoring...")
```

```
    result = None
```

```
    try:
```

```
        if not self.is_monitoring:
```

```
            # If no monitoring session is active
```

```
            result = "There was no active price monitoring session. Nothing to stop."
```

```
        else:
```

```
            # Stop monitoring and collect results
```

```
            self.is_monitoring = False
```

```
            result = "Results for price monitoring:\n"
```

```
            result += "\n".join(self.results)
```

```
            result = result + "\n" + "\nPrice monitoring stopped successfully!"
```

```
            print(result)
```

```
    except Exception as e:
```

```
        # Handle any error that occurs
```

```
        result = f"Error stopping price monitoring: {str(e)}"
```

```
    return result
```

```
--- __init__.py ---
```

```
#empty init file
```

```
--- AccountDAO.py ---
```

```
import psycopg2
```

```
from utils.Config import Config
```

```
class AccountDAO:
```

```
    def __init__(self):
```

```
        self.dbname = "postgres"
```

```
        self.user = "postgres"
```

```
        self.host = "localhost"
```

```
        self.port = "5432"
```

```
        self.password = Config.DATABASE_PASSWORD
```

```
    def connect(self):
```

```
        """Establish a database connection."""
```

```
        try:
```

```
            self.connection = psycopg2.connect(
```

```
                dbname=self.dbname,
```

```
                user=self.user,
```

```
                password=self.password,
```

```
                host=self.host,
```

```
                port=self.port
```

```
            )
```

```
self.cursor = self.connection.cursor()
```

```
print("Database Connection Established.")
```

```
except Exception as error:
```

```
    print(f"Error connecting to the database: {error}")
```

```
    self.connection = None
```

```
    self.cursor = None
```

```
def add_account(self, username: str, password: str, website: str):
```

```
    """Add a new account to the database using structured data."""
```

```
    try:
```

```
        # Combine DTO logic here by directly using the parameters
```

```
        query = "INSERT INTO accounts (username, password, website) VALUES (%s, %s, %s)"
```

```
        values = (username, password, website)
```

```
        self.cursor.execute(query, values)
```

```
        self.connection.commit()
```

```
        print(f"Account {username} added successfully.")
```

```
        return True
```

```
    except Exception as error:
```

```
        print(f"Error inserting account: {error}")
```

```
        return False
```

```
def fetch_account_by_website(self, website):
```

```
    """Fetch account credentials for a specific website."""
```

```
    try:
```

```
        query = "SELECT username, password FROM accounts WHERE LOWER(website) =  
LOWER(%s)"
```

```
        self.cursor.execute(query, (website,))
```



```
result = self.cursor.fetchone()
```

```
print(result)
```

```
return result
```

```
except Exception as error:
```

```
print(f"Error fetching account for website {website}: {error}")
```

```
return None
```

```
def fetch_all_accounts(self):
```

```
    """Fetch all accounts from the database."""
```

```
    try:
```

```
        query = "SELECT id, username, password, website FROM accounts"
```

```
        self.cursor.execute(query)
```

```
        result = self.cursor.fetchall()
```

```
        print(result)
```

```
        return result
```

```
    except Exception as error:
```

```
        print(f"Error fetching accounts: {error}")
```

```
        return []
```

```
def delete_account(self, account_id):
```

```
    """Delete an account by its ID."""
```

```
    try:
```

```
        self.cursor.execute("DELETE FROM accounts WHERE id = %s", (account_id,))
```

```
        self.connection.commit()
```

```
        if self.cursor.rowcount > 0: # Check if any rows were affected
```

```
            print(f"Account with ID {account_id} deleted successfully.")
```

```
        return True
```

else:

print(f"No account found with ID {account\_id}.")

return False

except Exception as error:

print(f"Error deleting account: {error}")

return False

def reset\_id\_sequence(self):

"""Reset the ID sequence to the maximum ID."""

try:

reset\_query = "SELECT setval('accounts\_id\_seq', (SELECT MAX(id) FROM accounts))"

self.cursor.execute(reset\_query)

self.connection.commit()

print("ID sequence reset successfully.")

except Exception as error:

print(f"Error resetting ID sequence: {error}")

def close(self):

"""Close the database connection."""

try:

if self.cursor:

self.cursor.close()

if self.connection:

self.connection.close()

print("Database connection closed.")

except Exception as error:

print(f"Error closing the database connection: {error}")

```
--- global_vars.py ---
```

```
import re
```

```
class GlobalState:
```

```
    user_message = 'default'
```

```
    @classmethod
```

```
    def reset_user_message(cls):
```

```
        """Reset the global user_message variable to None."""
```

```
        cls.user_message = None
```

```
    @classmethod
```

```
    def parse_user_message(cls, message):
```

```
        """
```

```
        Parses a user message by splitting it into command and up to 6 variables.
```

```
        Handles quoted substrings so that quoted parts (e.g., "October 2") remain intact.
```

```
        """
```

```
        #print(f"User_message before parsing: {message}")
```

```
        message = message.replace("!", "").strip() # Remove "!" and strip spaces
```

```
        #print(f"User_message after replacing '!' with empty string: {message}")
```

```
        # Simple split by spaces, keeping quoted substrings intact
```

```
        parts = re.findall(r"\"[^\"]+\"|\\S+", message)
```

```
        #print(f"Parts after splitting: {parts}")
```

```
# Ensure we always return 6 variables (command + 5 parts), even if some are empty
result = [parts[i].strip("") if len(parts) > i else "" for i in range(6)] # List comprehension to handle
missing parts
```

```
#print(f"Result: {result}")

return result # Return the list (or tuple if needed)
```

```
--- AvailabilityEntity.py ---
```

```
import asyncio

from utils.exportUtils import ExportUtils

from entity.BrowserEntity import BrowserEntity

from utils.css_selectors import Selectors

from selenium.webdriver.common.by import By

from selenium.webdriver.support.ui import WebDriverWait

from selenium.webdriver.support import expected_conditions as EC
```

```
class AvailabilityEntity:
```

```
    def __init__(self):

        self.browser_entity = BrowserEntity()
```

```
    async def check_availability(self, url: str, date_str=None, timeout=15):
```

```
        try:

            # Use BrowserEntity to navigate to the URL

            self.browser_entity.navigate_to_website(url)
```

```

# Get selectors for the given URL

selectors = Selectors.get_selectors_for_url(url)


# Perform date selection (optional)

if date_str:

    try:

        await asyncio.sleep(3) # Wait for updates to load

        print(selectors['date_field'])

        date_field = self.browser_entity.driver.find_element(By.CSS_SELECTOR,
selectors['date_field'])

        date_field.click()

        await asyncio.sleep(3)

        date_button = self.browser_entity.driver.find_element(By.CSS_SELECTOR,
f"{selectors['select_date']} button[aria-label*='{date_str}']")

        date_button.click()

    except Exception as e:

        return f"Failed to select the date: {str(e)}"


await asyncio.sleep(2) # Wait for updates to load


# Initialize flags for select_time and no_availability elements

select_time_seen = False

no_availability_seen = False

try:

    # Check if 'select_time' is available within the given timeout

    WebDriverWait(self.browser_entity.driver, timeout).until(

        EC.presence_of_element_located((By.CSS_SELECTOR, selectors['select_time']))

```

```

    )

    select_time_seen = True # If found, set the flag to True
except:

    select_time_seen = False # If not found within timeout

try:

    # Check if 'no_availability' is available within the given timeout

    WebDriverWait(self.browser_entity.driver, timeout).until(

        lambda driver: len(driver.find_elements(By.CSS_SELECTOR,
selectors['show_next_available_button'])) > 0

    )

    no_availability_seen = True # If found, set the flag to True
except:

    no_availability_seen = False # If not found within timeout


# Logic to determine availability

if select_time_seen:

    return f"Selected or default date {date_str if date_str else 'current date'} is available for
booking."

elif no_availability_seen:

    return "No availability for the selected date."

else:

    return "Unable to determine availability. Please try again."


except Exception as e:

    return f"Failed to check availability: {str(e)}"

```

```
def export_data(self, dto):
```

```
    """Export price data to both Excel and HTML using ExportUtils.
```

dto: This is a Data Transfer Object (DTO) that contains the command, URL, result, date, and time.

```
    """
```

```
    try:
```

```
        # Extract the data from the DTO
```

```
        command = dto.get('command')
```

```
        url = dto.get('url')
```

```
        result = dto.get('result')
```

```
        entered_date = dto.get('entered_date') # Optional, could be None
```

```
        entered_time = dto.get('entered_time') # Optional, could be None
```

```
        # Call the Excel export method from ExportUtils
```

```
        excelResult = ExportUtils.log_to_excel(
```

```
            command=command,
```

```
            url=url,
```

```
            result=result,
```

```
            entered_date=entered_date, # Pass the optional entered_date
```

```
            entered_time=entered_time # Pass the optional entered_time
```

```
        )
```

```
        print(excelResult)
```

```
        # Call the HTML export method from ExportUtils
```

```
        htmlResult = ExportUtils.export_to_html(
```

```
            command=command,
```

```

        url=url,

        result=result,

        entered_date=entered_date, # Pass the optional entered_date

        entered_time=entered_time # Pass the optional entered_time

    )

    print(htmlResult)

    # Export operations...

except Exception as e:

    return f"priceEntity_Error exporting data: {str(e)}"

```

--- BrowserEntity.py ---

```

import asyncio

from selenium.webdriver.common.by import By

from selenium.webdriver.support.ui import WebDriverWait

from selenium.webdriver.support import expected_conditions as EC

from selenium import webdriver

from selenium.webdriver.chrome.service import Service

from utils.css_selectors import Selectors

```

```

class BrowserEntity:

```

```

    _instance = None

```

```

    def __new__(cls, *args, **kwargs):

```

```

        if not cls._instance:

```



```
cls._instance = super(BrowserEntity, cls).__new__(cls, *args, **kwargs)

return cls._instance
```

```
def __init__(self):

    self.driver = None

    self.browser_open = False
```

```
def set_browser_open(self, is_open: bool):

    self.browser_open = is_open
```

```
def is_browser_open(self) -> bool:

    return self.browser_open
```

```
def launch_browser(self):

    try:

        if not self.browser_open:

            options = webdriver.ChromeOptions()

            options.add_argument("--remote-debugging-port=9222")

            options.add_experimental_option("excludeSwitches", ["enable-automation"])

            options.add_experimental_option('useAutomationExtension', False)

            options.add_argument("--start-maximized")

            options.add_argument("--disable-notifications")

            options.add_argument("--disable-popup-blocking")
```

```
options.add_argument("--disable-infobars")
options.add_argument("--disable-extensions")
options.add_argument("--disable-webgl")
options.add_argument("--disable-webrtc")
options.add_argument("--disable-rtc-smoothing")
```

```
self.driver = webdriver.Chrome(service=Service(), options=options)
```

```
self.browser_open = True
```

```
result = "Browser launched."
```

```
return result
```

```
else:
```

```
result = "Browser is already running."
```

```
return result
```

```
except Exception as e:
```

```
result = f"BrowserEntity_Failed to launch browser: {str(e)}"
```

```
return result
```

```
def close_browser(self):
```

```
try:
```

```
if self.browser_open and self.driver:
```

```
self.driver.quit()
```

```
self.browser_open = False
```

```
return "Browser closed."
```

```
else:
```

```
return "No browser is currently open."
```

```
except Exception as e:
```

```
return f"BrowserEntity_Failed to close browser: {str(e)}"
```

```

def navigate_to_website(self, url):
    try:
        if not self.is_browser_open():
            launch_message = self.launch_browser()
            if "Failed" in launch_message:
                return launch_message

        if self.driver:
            self.driver.get(url)
            return f"Navigated to {url}"
        else:
            return "Failed to open browser."
    except Exception as e:
        return f"BrowserEntity_Failed to navigate to {url}: {str(e)}"

```

```

async def login(self, url, username, password):

```

```

    try:
        navigate_message = self.navigate_to_website(url)
        if "Failed" in navigate_message:
            return navigate_message

```

```

        email_field = self.driver.find_element(By.CSS_SELECTOR,
Selectors.get_selectors_for_url(url)['email_field'])
        email_field.send_keys(username)
        await asyncio.sleep(3)

```

```

        password_field = self.driver.find_element(By.CSS_SELECTOR,
Selectors.get_selectors_for_url(url)['password_field'])

        password_field.send_keys(password)

        await asyncio.sleep(3)

        sign_in_button = self.driver.find_element(By.CSS_SELECTOR,
Selectors.get_selectors_for_url(url)['SignIn_button'])

        sign_in_button.click()

        await asyncio.sleep(5)

WebDriverWait(self.driver,
30).until(EC.presence_of_element_located((By.CSS_SELECTOR,
Selectors.get_selectors_for_url(url)['homePage'])))

        return f"Logged in to {url} successfully with username: {username}"

    except Exception as e:

        return f"BrowserEntity_Failed to log in to {url}: {str(e)}"

```

--- PriceEntity.py ---

```

from selenium.webdriver.common.by import By

from entity.BrowserEntity import BrowserEntity

from utils.exportUtils import ExportUtils # Import ExportUtils for handling data export

from utils.css_selectors import Selectors # Import selectors to get CSS selectors for the browser

class PriceEntity:

    """PriceEntity is responsible for interacting with the system (browser) to fetch prices
    and handle the exporting of data to Excel and HTML."""

```

```

def __init__(self):

    self.browser_entity = BrowserEntity()


def get_price_from_page(self, url: str):

    # Navigate to the URL using BrowserEntity

    self.browser_entity.navigate_to_website(url)

    selectors = Selectors.get_selectors_for_url(url)

    try:

        # Find the price element on the page using the selector

        price_element = self.browser_entity.driver.find_element(By.CSS_SELECTOR,
selectors['price'])

        result = price_element.text

        return result

    except Exception as e:

        return f"Error fetching price: {str(e)}"


def export_data(self, dto):

    """Export price data to both Excel and HTML using ExportUtils.

    dto: This is a Data Transfer Object (DTO) that contains the command, URL, result, date, and
time.

    """

    try:

        # Extract the data from the DTO

        command = dto.get('command')

        url = dto.get('url')

```

```
result = dto.get('result')

entered_date = dto.get('entered_date') # Optional, could be None

entered_time = dto.get('entered_time') # Optional, could be None
```

```
# Call the Excel export method from ExportUtils
```

```
excelResult = ExportUtils.log_to_excel(

    command=command,

    url=url,

    result=result,

    entered_date=entered_date, # Pass the optional entered_date

    entered_time=entered_time # Pass the optional entered_time

)

print(excelResult)
```

```
# Call the HTML export method from ExportUtils
```

```
htmlResult = ExportUtils.export_to_html(

    command=command,

    url=url,

    result=result,

    entered_date=entered_date, # Pass the optional entered_date

    entered_time=entered_time # Pass the optional entered_time

)

print(htmlResult)
```

```
except Exception as e:
```

```
    return f"priceEntity_Error exporting data: {str(e)}"
```

```
--- __init__.py ---
```

#empty init file

--- temporary.py ---

import pytest, logging

from unittest.mock import patch

from test\_init import base\_test\_case, setup\_logging, log\_test\_start\_end

# Enable asyncio for all tests in this file

pytestmark = pytest.mark.asyncio

setup\_logging()

# Test for successful availability check (Control and Entity Layers)

async def test\_check\_availability\_success(base\_test\_case):

with patch('entity.AvailabilityEntity.AvailabilityEntity.check\_availability') as mock\_check:

url = "https://example.com"

mock\_check.return\_value = f"Selected or default date current date is available for booking."

expected\_entity\_result = f"Selected or default date current date is available for booking."

expected\_control\_result = f"Checked availability: Selected or default date current date is available for booking."

# Execute the command

result = await base\_test\_case.availability\_control.receive\_command("check\_availability", url)

# Log and assert the outcomes

logging.info(f"Entity Layer Expected: {expected\_entity\_result}")

logging.info(f"Entity Layer Received: {mock\_check.return\_value}")

assert mock\_check.return\_value == expected\_entity\_result, "Entity layer assertion failed."

```
logging.info("Unit Test Passed for entity layer.\n")
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer.")
```

```
# Test for failure in entity layer (Control should handle it gracefully)
```

```
async def test_check_availability_failure_entity(base_test_case):
```

```
    with patch('entity.AvailabilityEntity.AvailabilityEntity.check_availability',
```

```
side_effect=Exception("Failed to check availability")) as mock_check:
```

```
    url = "https://example.com"
```

```
    expected_control_result = "Failed to check availability: Failed to check availability"
```

```
# Execute the command
```

```
result = await base_test_case.availability_control.receive_command("check_availability", url)
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer failed to handle entity error correctly."
```

```
logging.info("Unit Test Passed for entity layer error handling.")
```

```
# Test for no availability scenario (control and entity)
```

```
async def test_check_availability_no_availability(base_test_case):
```

```
    with patch('entity.AvailabilityEntity.AvailabilityEntity.check_availability') as mock_check:
```

```
        url = "https://example.com"
```



```
mock_check.return_value = "No availability for the selected date."
```

```
expected_control_result = "Checked availability: No availability for the selected date."
```

```
# Execute the command
```

```
result = await base_test_case.availability_control.receive_command("check_availability", url)
```

```
# Log and assert the outcomes
```

```
logging.info(f"Entity Layer Received: {mock_check.return_value}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
    assert result == expected_control_result, "Control layer failed to handle no availability  
scenario."
```

```
logging.info("Unit Test Passed for control layer no availability handling.")
```

```
# Test for control layer failure scenario
```

```
async def test_check_availability_failure_control(base_test_case):
```

```
    with patch('control.AvailabilityControl.AvailabilityControl.receive_command',
```

```
side_effect=Exception("Control Layer Failed")) as mock_control:
```

```
    url = "https://example.com"
```

```
    expected_control_result = "Control Layer Exception: Control Layer Failed"
```

```
# Execute the command and catch the raised exception
```

```
try:
```

```
    result = await base_test_case.availability_control.receive_command("check_availability", url)
```

```
except Exception as e:
```

```
    result = f"Control Layer Exception: {str(e)}"
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")

logging.info(f"Control Layer Received: {result}")

assert result == expected_control_result, "Control layer assertion failed."

logging.info("Unit Test Passed for control layer failure.")
```

```
if __name__ == "__main__":

    pytest.main([__file__])
```

--- test\_init.py ---

```
import sys, os, logging, pytest, asyncio

import subprocess

from unittest.mock import patch, MagicMock

sys.path.append(os.path.dirname(os.path.dirname(os.path.abspath(__file__))))
```

#pytest -v > test\_results.txt

#Run this command in the terminal to save the test results to a file

```
async def run_monitoring_loop(control_object, check_function, url, date_str, frequency,
iterations=1):

    """Run the monitoring loop for a control object and execute a check function."""

    control_object.is_monitoring = True

    results = []

    while control_object.is_monitoring and iterations > 0:

        try:

            result = await check_function(url, date_str)
```

```
except Exception as e:
```

```
    result = f"Failed to monitor: {str(e)}"
```

```
    logging.info(f"Monitoring Iteration: {result}")
```

```
    results.append(result)
```

```
    iterations -= 1
```

```
    await asyncio.sleep(frequency)
```

```
control_object.is_monitoring = False
```

```
results.append("Monitoring stopped successfully!")
```

```
return results
```

```
def setup_logging():
```

```
    """Set up logging without timestamp and other unnecessary information."""
```

```
    logger = logging.getLogger()
```

```
    if not logger.handlers:
```

```
        logging.basicConfig(level=logging.INFO, format='%(message)s')
```

```
def save_test_results_to_file(output_file="test_results.txt"):
```

```
    """Helper function to run pytest and save results to a file."""
```

```
    print("Running tests and saving results to file...")
```

```
    output_path = os.path.join(os.path.dirname(os.path.abspath(__file__)), output_file)
```

```
    with open(output_path, 'w') as f:
```

```
        # Use subprocess to call pytest and redirect output to file
```

```
        subprocess.run(['pytest', '-v'], stdout=f, stderr=subprocess.STDOUT)
```

```
# Custom fixture for logging test start and end
```

```
@pytest.fixture(autouse=True)
```

```

def log_test_start_end(request):

    test_name = request.node.name

    logging.info(f"-----\nStarting test: {test_name}\n")

    # Yield control to the test function

    yield

    # Log after the test finishes

    logging.info(f"\nFinished test: {test_name}\n-----")


# Import your control classes

from control.BrowserControl import BrowserControl

from control.AccountControl import AccountControl

from control.AvailabilityControl import AvailabilityControl

from control.PriceControl import PriceControl

from control.BotControl import BotControl


@pytest.fixture

def base_test_case():

    """Base test setup that can be used by all test functions."""

    test_case = MagicMock()

    test_case.browser_control = BrowserControl()

    test_case.account_control = AccountControl()

    test_case.availability_control = AvailabilityControl()

    test_case.price_control = PriceControl()

    test_case.bot_control = BotControl()

    return test_case

```

```

if __name__ == "__main__":

    # Save the pytest output to a file in the same folder

    save_test_results_to_file(output_file="test_results.txt")

--- unitTest_add_account.py ---

import pytest, logging

from unittest.mock import patch

from test_init import base_test_case, setup_logging, log_test_start_end, save_test_results_to_file


# Enable asyncio for all tests in this file

pytestmark = pytest.mark.asyncio

setup_logging()


async def test_add_account_success(base_test_case):

    with patch('control.AccountControl.AccountControl.add_account', return_value="Account for
example.com added successfully.") as mock_add_account:

        # Setup expected outcomes

        username = "test_user"

        password = "test_pass"

        website = "example.com"

        expected_entity_result = "Account for example.com added successfully."

        expected_control_result = "Account for example.com added successfully."


        # Execute the command

        result = base_test_case.account_control.add_account(username, password, website)

```

```

# Log and assert the outcomes

logging.info(f"Entity Layer Expected: {expected_entity_result}")

logging.info(f"Entity Layer Received: {mock_add_account.return_value}")

    assert mock_add_account.return_value == expected_entity_result, "Entity layer assertion
failed."

logging.info("Unit Test Passed for entity layer.\n")


logging.info(f"Control Layer Expected: {expected_control_result}")

logging.info(f"Control Layer Received: {result}")

assert result == expected_control_result, "Control layer assertion failed."

logging.info("Unit Test Passed for control layer.")


async def test_add_account_failure_invalid_data(base_test_case):

    with patch('control.AccountControl.AccountControl.add_account', return_value="Failed to add
account for example.com.") as mock_add_account:

        # Setup expected outcomes for invalid data scenario

        username = "" # Invalid username

        password = "" # Invalid password

        website = "example.com"

        expected_control_result = "Failed to add account for example.com."


        # Execute the command

        result = base_test_case.account_control.add_account(username, password, website)


        # Log and assert the outcomes

        logging.info(f"Control Layer Expected: {expected_control_result}")

        logging.info(f"Control Layer Received: {result}")

```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer invalid data handling.\n")
```

```
async def test_add_account_failure_entity_error(base_test_case):
```

```
    with patch('control.AccountControl.AccountControl.add_account',
```

```
side_effect=Exception("Database Error")) as mock_add_account:
```

```
    # Setup expected outcomes
```

```
    username = "test_user"
```

```
    password = "test_pass"
```

```
    website = "example.com"
```

```
    expected_control_result = "Control Layer Exception: Database Error"
```

```
    # Execute the command
```

```
    try:
```

```
        result = base_test_case.account_control.add_account(username, password, website)
```

```
    except Exception as e:
```

```
        result = f"Control Layer Exception: {str(e)}"
```

```
    # Log and assert the outcomes
```

```
    logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
    logging.info(f"Control Layer Received: {result}")
```

```
    assert result == expected_control_result, "Control layer failed to handle entity error correctly."
```

```
    logging.info("Unit Test Passed for control layer error handling.")
```

```
async def test_add_account_already_exists(base_test_case):
```

```
    # This simulates a scenario where an account for the website already exists
```

```
    with patch('control.AccountControl.AccountControl.add_account', return_value="Failed to add
```

account for example.com. Account already exists.") as mock\_add\_account:

```
# Setup expected outcomes
```

```
username = "test_user"
```

```
password = "test_pass"
```

```
website = "example.com"
```

```
expected_control_result = "Failed to add account for example.com. Account already exists."
```

```
# Execute the command
```

```
result = base_test_case.account_control.add_account(username, password, website)
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer when account already exists.")
```

```
if __name__ == "__main__":
```

```
    pytest.main([__file__])
```

```
--- unitTest_check_availability.py ---
```

```
import pytest, logging
```

```
from unittest.mock import patch
```

```
from test_init import base_test_case, setup_logging, log_test_start_end
```

```
# Enable asyncio for all tests in this file
```

```
pytestmark = pytest.mark.asyncio
```



```
setup_logging()
```

```
# Test for successful availability check (Control and Entity Layers)
```

```
async def test_check_availability_success(base_test_case):
```

```
    with patch('entity.AvailabilityEntity.AvailabilityEntity.check_availability') as mock_check:
```

```
        url = "https://example.com"
```

```
        mock_check.return_value = f"Selected or default date current date is available for booking."
```

```
        expected_entity_result = f"Selected or default date current date is available for booking."
```

```
            expected_control_result = f"Checked availability: Selected or default date current date is  
available for booking."
```

```
    # Execute the command
```

```
    result = await base_test_case.availability_control.receive_command("check_availability", url)
```

```
    # Log and assert the outcomes
```

```
    logging.info(f"Entity Layer Expected: {expected_entity_result}")
```

```
    logging.info(f"Entity Layer Received: {mock_check.return_value}")
```

```
    assert mock_check.return_value == expected_entity_result, "Entity layer assertion failed."
```

```
    logging.info("Unit Test Passed for entity layer.\n")
```

```
    logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
    logging.info(f"Control Layer Received: {result}")
```

```
    assert result == expected_control_result, "Control layer assertion failed."
```

```
    logging.info("Unit Test Passed for control layer.")
```

```
# Test for failure in entity layer (Control should handle it gracefully)
```

```
async def test_check_availability_failure_entity(base_test_case):
```

```

        with patch('entity.AvailabilityEntity.AvailabilityEntity.check_availability',
side_effect=Exception("Failed to check availability")) as mock_check:

    url = "https://example.com"

    expected_control_result = "Failed to check availability: Failed to check availability"

    # Execute the command

    result = await base_test_case.availability_control.receive_command("check_availability", url)

    # Log and assert the outcomes

    logging.info(f"Control Layer Expected: {expected_control_result}")

    logging.info(f"Control Layer Received: {result}")

    assert result == expected_control_result, "Control layer failed to handle entity error correctly."

    logging.info("Unit Test Passed for entity layer error handling.")

# Test for no availability scenario (control and entity)

async def test_check_availability_no_availability(base_test_case):

    with patch('entity.AvailabilityEntity.AvailabilityEntity.check_availability') as mock_check:

        url = "https://example.com"

        mock_check.return_value = "No availability for the selected date."

        expected_control_result = "Checked availability: No availability for the selected date."

        # Execute the command

        result = await base_test_case.availability_control.receive_command("check_availability", url)

        # Log and assert the outcomes

        logging.info(f"Entity Layer Received: {mock_check.return_value}")

        logging.info(f"Control Layer Received: {result}")

```

```
        assert result == expected_control_result, "Control layer failed to handle no availability scenario."
```

```
    logging.info("Unit Test Passed for control layer no availability handling.")
```

```
# Test for control layer failure scenario
```

```
async def test_check_availability_failure_control(base_test_case):
```

```
    with patch('control.AvailabilityControl.AvailabilityControl.receive_command',
```

```
side_effect=Exception("Control Layer Failed")) as mock_control:
```

```
    url = "https://example.com"
```

```
    expected_control_result = "Control Layer Exception: Control Layer Failed"
```

```
# Execute the command and catch the raised exception
```

```
try:
```

```
    result = await base_test_case.availability_control.receive_command("check_availability", url)
```

```
except Exception as e:
```

```
    result = f"Control Layer Exception: {str(e)}"
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer failure.")
```

```
if __name__ == "__main__":
```

```
    pytest.main([__file__])
```

```
--- unitTest_close_browser.py ---
```

```
import pytest, logging
```

```
from unittest.mock import patch
```

```
from test_init import base_test_case, setup_logging, log_test_start_end
```

```
# Enable asyncio for all tests in this file
```

```
pytestmark = pytest.mark.asyncio
```

```
setup_logging()
```

```
async def test_close_browser_success(base_test_case):
```

```
    with patch('entity.BrowserEntity.BrowserEntity.close_browser') as mock_close:
```

```
        # Set up mock and expected outcomes
```

```
        mock_close.return_value = "Browser closed."
```

```
        expected_entity_result = "Browser closed."
```

```
        expected_control_result = "Control Object Result: Browser closed."
```

```
        # Execute the command
```

```
        result = await base_test_case.browser_control.receive_command("close_browser")
```

```
        # Log and assert the outcomes
```

```
        logging.info(f"Entity Layer Expected: {expected_entity_result}")
```

```
        logging.info(f"Entity Layer Received: {mock_close.return_value}")
```

```
        assert mock_close.return_value == expected_entity_result, "Entity layer assertion failed."
```

```
        logging.info("Unit Test Passed for entity layer.\n")
```

```
        logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
        logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer.")
```

```
async def test_close_browser_not_open(base_test_case):
```

```
    with patch('entity.BrowserEntity.BrowserEntity.close_browser') as mock_close:
```

```
        # Set up mock and expected outcomes
```

```
        mock_close.return_value = "No browser is currently open."
```

```
        expected_entity_result = "No browser is currently open."
```

```
        expected_control_result = "Control Object Result: No browser is currently open."
```

```
        # Execute the command
```

```
        result = await base_test_case.browser_control.receive_command("close_browser")
```

```
        # Log and assert the outcomes
```

```
        logging.info(f"Entity Layer Expected: {expected_entity_result}")
```

```
        logging.info(f"Entity Layer Received: {mock_close.return_value}")
```

```
        assert mock_close.return_value == expected_entity_result, "Entity layer assertion failed."
```

```
        logging.info("Unit Test Passed for entity layer.\n")
```

```
        logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
        logging.info(f"Control Layer Received: {result}")
```

```
        assert result == expected_control_result, "Control layer assertion failed."
```

```
        logging.info("Unit Test Passed for control layer.")
```

```
async def test_close_browser_failure_control(base_test_case):
```

```
    with patch('entity.BrowserEntity.BrowserEntity.close_browser',
```

```
side_effect=Exception("Unexpected error")) as mock_close:
```

```
# Set up expected outcome
```

```
expected_result = "Control Layer Exception: Unexpected error"
```

```
# Execute the command
```

```
result = await base_test_case.browser_control.receive_command("close_browser")
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected to Report: {expected_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_result, "Control layer failed to handle or report the error correctly."
```

```
logging.info("Unit Test Passed for control layer error handling.")
```

```
async def test_close_browser_failure_entity(base_test_case):
```

```
    with patch('entity.BrowserEntity.BrowserEntity.close_browser',
```

```
side_effect=Exception("BrowserEntity_Failed to close browser: Internal error")) as mock_close:
```

```
# Set up expected outcome
```

```
internal_error_message = "BrowserEntity_Failed to close browser: Internal error"
```

```
expected_control_result = f"Control Layer Exception: {internal_error_message}"
```

```
# Execute the command
```

```
result = await base_test_case.browser_control.receive_command("close_browser")
```

```
# Log and assert the outcomes
```

```
logging.info(f"Entity Layer Expected Failure: {internal_error_message}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer failed to report entity error correctly."
```

```
logging.info("Unit Test Passed for entity layer error handling.")
```

```
if __name__ == "__main__":
```

```
    pytest.main([__file__])
```

```
--- unitTest_delete_account.py ---
```

```
import pytest, logging
```

```
from unittest.mock import patch
```

```
from test_init import base_test_case, setup_logging, log_test_start_end
```

```
# Enable asyncio for all tests in this file
```

```
pytestmark = pytest.mark.asyncio
```

```
setup_logging()
```

```
async def test_delete_account_success(base_test_case):
```

```
    with patch('DataObjects.AccountDAO.AccountDAO.delete_account') as mock_delete:
```

```
        # Setup mock return and expected outcomes
```

```
        account_id = 1
```

```
        mock_delete.return_value = True
```

```
        expected_entity_result = "Account with ID 1 deleted successfully."
```

```
        expected_control_result = "Account with ID 1 deleted successfully."
```

```
        # Execute the command
```

```
        result = base_test_case.account_control.delete_account(account_id)
```

```
        # Log and assert the outcomes
```

```
        logging.info(f"Entity Layer Expected: {expected_entity_result}")
```

```
logging.info(f"Entity Layer Received: {mock_delete.return_value}")

assert mock_delete.return_value == True, "Entity layer assertion failed."

logging.info("Unit Test Passed for entity layer.\n")
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")

logging.info(f"Control Layer Received: {result}")

assert result == expected_control_result, "Control layer assertion failed."

logging.info("Unit Test Passed for control layer.")
```

```
async def test_delete_account_not_found(base_test_case):

    with patch('DataObjects.AccountDAO.AccountDAO.delete_account') as mock_delete:

        # Setup mock return and expected outcomes

        account_id = 999

        mock_delete.return_value = False

        expected_control_result = "Failed to delete account with ID 999."

        # Execute the command

        result = base_test_case.account_control.delete_account(account_id)

        # Log and assert the outcomes

        logging.info(f"Control Layer Expected: {expected_control_result}")

        logging.info(f"Control Layer Received: {result}")

        assert result == expected_control_result, "Control layer assertion failed."

        logging.info("Unit Test Passed for control layer with account not found.\n")
```

```
async def test_delete_account_failure_entity(base_test_case):

    with patch('DataObjects.AccountDAO.AccountDAO.delete_account',
```



```
side_effect=Exception("Failed to delete account in DAO")) as mock_delete:
```

```
# Setup expected outcomes
```

```
account_id = 1
```

```
expected_control_result = "Error deleting account."
```

```
# Execute the command
```

```
result = base_test_case.account_control.delete_account(account_id)
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer failed to handle entity error correctly."
```

```
logging.info("Unit Test Passed for entity layer error handling.")
```

```
async def test_delete_account_failure_control(base_test_case):
```

```
# This simulates a failure within the control layer
```

```
with patch('control.AccountControl.AccountControl.delete_account',
```

```
side_effect=Exception("Control Layer Failed")) as mock_control:
```

```
# Setup expected outcomes
```

```
account_id = 1
```

```
expected_control_result = "Control Layer Exception: Control Layer Failed"
```

```
# Execute the command and catch the raised exception
```

```
try:
```

```
    result = base_test_case.account_control.delete_account(account_id)
```

```
except Exception as e:
```

```
result = f"Control Layer Exception: {str(e)}"
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer failure.")
```

```
if __name__ == "__main__":
```

```
    pytest.main([__file__])
```

```
--- unitTest_fetch_account_by_website.py ---
```

```
import pytest
```

```
import logging
```

```
from unittest.mock import patch
```

```
from test_init import base_test_case, setup_logging, log_test_start_end
```

```
# Enable asyncio for all tests in this file
```

```
pytestmark = pytest.mark.asyncio
```

```
setup_logging()
```

```
async def test_fetch_account_by_website_success(base_test_case):
```

```
    with patch('DataObjects.AccountDAO.AccountDAO.fetch_account_by_website') as mock_fetch:
```

```
        # Setup mock return and expected outcomes
```

```
        website = "example.com"
```

```
        mock_fetch.return_value = ("sample_username", "sample_password")
```

```
expected_entity_result = ("sample_username", "sample_password")
expected_control_result = ("sample_username", "sample_password")
```

```
# Execute the command
```

```
result = base_test_case.account_control.fetch_account_by_website(website)
```

```
# Log and assert the outcomes
```

```
logging.info(f"Entity Layer Expected: {expected_entity_result}")
```

```
logging.info(f"Entity Layer Received: {mock_fetch.return_value}")
```

```
assert mock_fetch.return_value == expected_entity_result, "Entity layer assertion failed."
```

```
logging.info("Unit Test Passed for entity layer.\n")
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer.")
```

```
async def test_fetch_account_by_website_no_account(base_test_case):
```

```
    with patch('DataObjects.AccountDAO.AccountDAO.fetch_account_by_website') as mock_fetch:
```

```
        # Setup mock return and expected outcomes
```

```
        website = "nonexistent.com"
```

```
        mock_fetch.return_value = None
```

```
        expected_control_result = "No account found for nonexistent.com."
```

```
# Execute the command
```

```
result = base_test_case.account_control.fetch_account_by_website(website)
```

```
# Log and assert the outcomes

logging.info(f"Control Layer Expected: {expected_control_result}")

logging.info(f"Control Layer Received: {result}")

assert result == expected_control_result, "Control layer assertion failed."

logging.info("Unit Test Passed for control layer no account found.\n")
```

```
async def test_fetch_account_by_website_failure_entity(base_test_case):

    with patch('DataObjects.AccountDAO.AccountDAO.fetch_account_by_website',
side_effect=Exception("Database Error")) as mock_fetch:

        # Setup expected outcomes

        website = "example.com"

        expected_control_result = "Error: Database Error"


        # Execute the command

        result = base_test_case.account_control.fetch_account_by_website(website)


        # Log and assert the outcomes

        logging.info(f"Control Layer Expected: {expected_control_result}")

        logging.info(f"Control Layer Received: {result}")

        assert result == expected_control_result, "Control layer failed to handle entity error correctly."

        logging.info("Unit Test Passed for entity layer error handling.")
```

```
async def test_fetch_account_by_website_failure_control(base_test_case):

    with patch('control.AccountControl.AccountControl.fetch_account_by_website',
```

```

side_effect=Exception("Control Layer Error")) as mock_control:

    # Setup expected outcomes

    website = "example.com"

    expected_control_result = "Control Layer Exception: Control Layer Error"


    # Execute the command and catch the raised exception

    try:

        result = base_test_case.account_control.fetch_account_by_website(website)

    except Exception as e:

        result = f"Control Layer Exception: {str(e)}"


    # Log and assert the outcomes

    logging.info(f"Control Layer Expected: {expected_control_result}")

    logging.info(f"Control Layer Received: {result}")

    assert result == expected_control_result, "Control layer failed to handle its own error correctly."

    logging.info("Unit Test Passed for control layer error handling.")

```

```

if __name__ == "__main__":

    pytest.main([__file__])

```

--- unitTest\_fetch\_all\_accounts.py ---

```

import pytest, logging

```

```

from unittest.mock import patch

```

```

from test_init import base_test_case, setup_logging, log_test_start_end

```

```
# Enable asyncio for all tests in this file
```

```
pytestmark = pytest.mark.asyncio
```

```
setup_logging()
```

```
async def test_fetch_all_accounts_success(base_test_case):
```

```
    with patch('DataObjects.AccountDAO.AccountDAO.fetch_all_accounts') as mock_fetch_all:
```

```
        # Setup mock return and expected outcomes
```

```
        mock_fetch_all.return_value = [(1, "user1", "pass1", "example.com"), (2, "user2", "pass2",  
"test.com")]
```

```
        expected_entity_result = "Accounts:\nID: 1, Username: user1, Password: pass1, Website:  
example.com\nID: 2, Username: user2, Password: pass2, Website: test.com"
```

```
        expected_control_result = expected_entity_result
```

```
    # Execute the command
```

```
    result = base_test_case.account_control.receive_command("fetch_all_accounts")
```

```
    # Log and assert the outcomes
```

```
    logging.info(f"Entity Layer Expected: {expected_entity_result}")
```

```
    logging.info(f"Entity Layer Received: {mock_fetch_all.return_value}")
```

```
        assert mock_fetch_all.return_value == [(1, "user1", "pass1", "example.com"), (2, "user2",  
"pass2", "test.com")], "Entity layer assertion failed."
```

```
    logging.info("Unit Test Passed for entity layer.\n")
```

```
    logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
    logging.info(f"Control Layer Received: {result}")
```

```
    assert result == expected_control_result, "Control layer assertion failed."
```

```
    logging.info("Unit Test Passed for control layer.")
```

```

async def test_fetch_all_accounts_no_accounts(base_test_case):

    with patch('DataObjects.AccountDAO.AccountDAO.fetch_all_accounts') as mock_fetch_all:

        # Setup mock return and expected outcomes

        mock_fetch_all.return_value = []

        expected_control_result = "No accounts found."


        # Execute the command

        result = base_test_case.account_control.receive_command("fetch_all_accounts")


        # Log and assert the outcomes

        logging.info(f"Control Layer Expected: {expected_control_result}")

        logging.info(f"Control Layer Received: {result}")

        assert result == expected_control_result, "Control layer assertion failed."

        logging.info("Unit Test Passed for control layer no accounts found.\n")


async def test_fetch_all_accounts_failure_entity(base_test_case):

    with patch('DataObjects.AccountDAO.AccountDAO.fetch_all_accounts',
side_effect=Exception("Database Error")) as mock_fetch_all:

        # Setup expected outcomes

        expected_control_result = "Error fetching accounts."


        # Execute the command

        result = base_test_case.account_control.receive_command("fetch_all_accounts")


        # Log and assert the outcomes

        logging.info(f"Control Layer Expected: {expected_control_result}")

```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer failed to handle entity error correctly."
```

```
logging.info("Unit Test Passed for entity layer error handling.")
```

```
if __name__ == "__main__":
```

```
    pytest.main([__file__])
```

```
--- unitTest_get_price.py ---
```

```
import pytest, logging
```

```
from unittest.mock import patch
```

```
from test_init import base_test_case, setup_logging, log_test_start_end
```

```
# Enable asyncio for all tests in this file
```

```
pytestmark = pytest.mark.asyncio
```

```
setup_logging()
```

```
async def test_get_price_success(base_test_case):
```

```
    # Simulate a successful price retrieval
```

```
    with patch('entity.PriceEntity.PriceEntity.get_price_from_page') as mock_get_price:
```

```
        url = "https://example.com/product"
```

```
        mock_get_price.return_value = "$199.99"
```

```
        expected_entity_result = "$199.99"
```

```
        expected_control_result = "$199.99"
```

```
    # Execute the command
```

```
    result = await base_test_case.price_control.receive_command("get_price", url)
```



```
# Log and assert the outcomes
```

```
logging.info(f"Entity Layer Expected: {expected_entity_result}")
```

```
logging.info(f"Entity Layer Received: {mock_get_price.return_value}")
```

```
assert mock_get_price.return_value == expected_entity_result, "Entity layer assertion failed."
```

```
logging.info("Unit Test Passed for entity layer.\n")
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer.")
```

```
async def test_get_price_invalid_url(base_test_case):
```

```
# Simulate an invalid URL case
```

```
with patch('entity.PriceEntity.PriceEntity.get_price_from_page') as mock_get_price:
```

```
    invalid_url = "invalid_url"
```

```
    mock_get_price.return_value = "Error fetching price: Invalid URL"
```

```
    expected_control_result = "Error fetching price: Invalid URL"
```

```
# Execute the command
```

```
result = await base_test_case.price_control.receive_command("get_price", invalid_url)
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer invalid URL handling.\n")
```

```
async def test_get_price_failure_entity(base_test_case):

    # Simulate an entity layer failure when fetching the price

    with patch('entity.PriceEntity.PriceEntity.get_price_from_page', side_effect=Exception("Failed to
fetch price")) as mock_get_price:

        url = "https://example.com/product"

        expected_control_result = "Failed to fetch price: Failed to fetch price"

    # Execute the command

    result = await base_test_case.price_control.receive_command("get_price", url)

    # Log and assert the outcomes

    logging.info(f"Control Layer Expected: {expected_control_result}")

    logging.info(f"Control Layer Received: {result}")

    assert result == expected_control_result, "Control layer failed to handle entity error correctly."

    logging.info("Unit Test Passed for entity layer error handling.")
```

```
async def test_get_price_failure_control(base_test_case):

    # Simulate a control layer failure

    with patch('control.PriceControl.PriceControl.receive_command', side_effect=Exception("Control
Layer Failed")) as mock_control:

        url = "https://example.com/product"

        expected_control_result = "Control Layer Exception: Control Layer Failed"

    # Execute the command and catch the raised exception

    try:

        result = await base_test_case.price_control.receive_command("get_price", url)
```

```
except Exception as e:
```

```
    result = f"Control Layer Exception: {str(e)}"
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer failure.")
```

```
if __name__ == "__main__":
```

```
    pytest.main([__file__])
```

```
--- unitTest_launch_browser.py ---
```

```
import pytest, logging
```

```
from unittest.mock import patch
```

```
from test_init import base_test_case, log_test_start_end, setup_logging
```

```
# Enable asyncio for all tests in this file
```

```
pytestmark = pytest.mark.asyncio
```

```
setup_logging()
```

```
async def test_launch_browser_success(base_test_case):
```

```
    with patch('entity.BrowserEntity.BrowserEntity.launch_browser') as mock_launch:
```

```
        # Setup mock return and expected outcomes
```

```
        mock_launch.return_value = "Browser launched."
```

```
        expected_entity_result = "Browser launched."
```

```
expected_control_result = "Control Object Result: Browser launched."
```

```
# Execute the command
```

```
result = await base_test_case.browser_control.receive_command("launch_browser")
```

```
# Log and assert the outcomes
```

```
logging.info(f"Entity Layer Expected: {expected_entity_result}")
```

```
logging.info(f"Entity Layer Received: {mock_launch.return_value}")
```

```
assert mock_launch.return_value == expected_entity_result, "Entity layer assertion failed."
```

```
logging.info("Unit Test Passed for entity layer.\n")
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer.")
```

```
async def test_launch_browser_already_running(base_test_case):
```

```
    with patch('entity.BrowserEntity.BrowserEntity.launch_browser', return_value="Browser is already running.") as mock_launch:
```

```
        expected_entity_result = "Browser is already running."
```

```
        expected_control_result = "Control Object Result: Browser is already running."
```

```
        result = await base_test_case.browser_control.receive_command("launch_browser")
```

```
        logging.info(f"Entity Layer Expected: {expected_entity_result}")
```

```
        logging.info(f"Entity Layer Received: {mock_launch.return_value}")
```

```
        assert mock_launch.return_value == expected_entity_result, "Entity layer assertion failed."
```

```
logging.info("Unit Test Passed for entity layer.\n")
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer.")
```

```
async def test_launch_browser_failure_control(base_test_case):
```

```
    with patch('entity.BrowserEntity.BrowserEntity.launch_browser', side_effect=Exception("Internal error")) as mock_launch:
```

```
        expected_result = "Control Layer Exception: Internal error"
```

```
        result = await base_test_case.browser_control.receive_command("launch_browser")
```

```
        logging.info(f"Control Layer Expected to Report: {expected_result}")
```

```
        logging.info(f"Control Layer Received: {result}")
```

```
        assert result == expected_result, "Control layer failed to handle or report the entity error correctly."
```

```
        logging.info("Unit Test Passed for control layer error handling.")
```

```
async def test_launch_browser_failure_entity(base_test_case):
```

```
    with patch('entity.BrowserEntity.BrowserEntity.launch_browser', side_effect=Exception("Failed to launch browser: Internal error")) as mock_launch:
```

```
        expected_control_result = "Control Layer Exception: Failed to launch browser: Internal error"
```

```
        result = await base_test_case.browser_control.receive_command("launch_browser")
```

```
logging.info(f"Entity Layer Expected Failure: Failed to launch browser: Internal error")

logging.info(f"Control Layer Received: {result}")

assert result == expected_control_result, "Control layer failed to report entity error correctly."

logging.info("Unit Test Passed for entity layer error handling.")
```

```
if __name__ == "__main__":

    pytest.main([__file__])
```

```
--- unitTest_login.py ---
```

```
import pytest
```

```
import logging
```

```
from unittest.mock import patch, MagicMock
```

```
from test_init import base_test_case, setup_logging, log_test_start_end
```

```
# Enable asyncio for all tests in this file
```

```
pytestmark = pytest.mark.asyncio
```

```
setup_logging()
```

```
async def test_login_success(base_test_case):
```

```
    """Test that the login is successful when valid credentials are provided."""
```

```
    # Patch methods
```

```
    with patch('entity.BrowserEntity.BrowserEntity.login') as mock_login:
```

```
        with patch('control.AccountControl.AccountControl.fetch_account_by_website') as
```

```
mock_fetch_account:
```

```

# Setup mock return values

mock_login.return_value = "Logged in to http://example.com successfully with username:
sample_username"

mock_fetch_account.return_value = ("sample_username", "sample_password")


expected_entity_result = "Logged in to http://example.com successfully with username:
sample_username"

expected_control_result = f"Control Object Result: {expected_entity_result}"


# Execute the command

result = await base_test_case.browser_control.receive_command("login",
site="example.com")


# Assert results and logging

logging.info(f"Entity Layer Expected: {expected_entity_result}")
logging.info(f"Entity Layer Received: {mock_login.return_value}")
assert mock_login.return_value == expected_entity_result, "Entity layer assertion failed."
logging.info("Unit Test Passed for entity layer.\n")


logging.info(f"Control Layer Expected: {expected_control_result}")
logging.info(f"Control Layer Received: {result}")
assert result == expected_control_result, "Control layer assertion failed."
logging.info("Unit Test Passed for control layer.")


async def test_login_no_account(base_test_case):

    """Test that the control layer handles the scenario where no account is found for the website."""

    with patch('control.AccountControl.AccountControl.fetch_account_by_website') as

```

mock\_fetch\_account:

# Setup mock to return no account

mock\_fetch\_account.return\_value = None

expected\_result = "No account found for example.com"

# Execute the command

result = await base\_test\_case.browser\_control.receive\_command("login", site="example.com")

# Assert results and logging

logging.info(f"Control Layer Expected: {expected\_result}")

logging.info(f"Control Layer Received: {result}")

assert result == expected\_result, "Control layer failed to handle missing account correctly."

logging.info("Unit Test Passed for missing account handling.")

async def test\_login\_entity\_layer\_failure(base\_test\_case):

"""Test that the control layer handles an exception raised in the entity layer."""

with patch('entity.BrowserEntity.BrowserEntity.login') as mock\_login:

with patch('control.AccountControl.AccountControl.fetch\_account\_by\_website') as

mock\_fetch\_account:

# Setup mocks

mock\_login.side\_effect = Exception("BrowserEntity\_Failed to log in to http://example.com:

Internal error")

mock\_fetch\_account.return\_value = ("sample\_username", "sample\_password")

expected\_result = "Control Layer Exception: BrowserEntity\_Failed to log in to

http://example.com: Internal error"



```
# Execute the command
```

```
        result = await base_test_case.browser_control.receive_command("login",  
site="example.com")
```

```
# Assert results and logging
```

```
logging.info(f"Control Layer Expected: {expected_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_result, "Control layer failed to handle entity layer exception."
```

```
logging.info("Unit Test Passed for entity layer failure.")
```

```
async def test_login_control_layer_failure(base_test_case):
```

```
    """Test that the control layer handles an unexpected failure or exception."""
```

```
        with patch('control.AccountControl.AccountControl.fetch_account_by_website') as
```

```
mock_fetch_account:
```

```
    # Simulate an exception being raised in the control layer
```

```
    mock_fetch_account.side_effect = Exception("Control layer failure during account fetch.")
```

```
    expected_result = "Control Layer Exception: Control layer failure during account fetch."
```

```
# Execute the command
```

```
result = await base_test_case.browser_control.receive_command("login", site="example.com")
```

```
# Assert results and logging
```

```
logging.info(f"Control Layer Expected: {expected_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_result, "Control layer failed to handle control layer exception."
```

```
logging.info("Unit Test Passed for control layer failure handling.")
```

```
async def test_login_invalid_url(base_test_case):
```

```
    """Test that the control layer handles the scenario where the URL or selectors are not found."""
```

```
        with patch('control.AccountControl.AccountControl.fetch_account_by_website') as
```

```
mock_fetch_account:
```

```
    with patch('utils.css_selectors.Selectors.get_selectors_for_url') as mock_get_selectors:
```

```
        # Setup mocks
```

```
        mock_fetch_account.return_value = ("sample_username", "sample_password")
```

```
        mock_get_selectors.return_value = {'url': None} # Simulate missing URL
```

```
        expected_result = "URL for example not found."
```

```
        # Execute the command
```

```
        result = await base_test_case.browser_control.receive_command("login", site="example")
```

```
        # Assert results and logging
```

```
        logging.info(f"Control Layer Expected: {expected_result}")
```

```
        logging.info(f"Control Layer Received: {result}")
```

```
        assert result == expected_result, "Control layer failed to handle missing URL or selectors."
```

```
        logging.info("Unit Test Passed for missing URL/selector handling.")
```

```
if __name__ == "__main__":
```

```
    pytest.main([__file__])
```

```
--- unitTest_navigate_to_website.py ---
```

```
import pytest, logging

from unittest.mock import patch

from test_init import base_test_case, setup_logging, log_test_start_end


# Enable asyncio for all tests in this file

pytestmark = pytest.mark.asyncio

setup_logging()


async def test_navigate_to_website_success(base_test_case):

    with patch('entity.BrowserEntity.BrowserEntity.navigate_to_website') as mock_navigate:

        # Setup mock return and expected outcomes

        url = "https://example.com"

        mock_navigate.return_value = f"Navigated to {url}"

        expected_entity_result = f"Navigated to {url}"

        expected_control_result = f"Control Object Result: Navigated to {url}"


        # Execute the command

        result = await base_test_case.browser_control.receive_command("navigate_to_website",
site=url)


        # Log and assert the outcomes

        logging.info(f"Entity Layer Expected: {expected_entity_result}")

        logging.info(f"Entity Layer Received: {mock_navigate.return_value}")

        assert mock_navigate.return_value == expected_entity_result, "Entity layer assertion failed."

        logging.info("Unit Test Passed for entity layer.\n")
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")

logging.info(f"Control Layer Received: {result}")

assert result == expected_control_result, "Control layer assertion failed."

logging.info("Unit Test Passed for control layer.")
```

```
async def test_navigate_to_website_invalid_url(base_test_case):

    with patch('entity.BrowserEntity.BrowserEntity.navigate_to_website') as mock_navigate:

        # Setup mock return and expected outcomes

        invalid_site = "invalid_site"

        mock_navigate.return_value = f"URL for {invalid_site} not found."

        expected_control_result = f"URL for {invalid_site} not found."


        # Execute the command

        result = await base_test_case.browser_control.receive_command("navigate_to_website",
site=invalid_site)


        # Log and assert the outcomes

        logging.info(f"Control Layer Expected: {expected_control_result}")

        logging.info(f"Control Layer Received: {result}")

        assert result == expected_control_result, "Control layer assertion failed."

        logging.info("Unit Test Passed for control layer invalid URL handling.\n")
```

```
async def test_navigate_to_website_failure_entity(base_test_case):

    with patch('entity.BrowserEntity.BrowserEntity.navigate_to_website',
side_effect=Exception("Failed to navigate")) as mock_navigate:
```

```

# Setup expected outcomes

url = "https://example.com"

expected_control_result = "Control Layer Exception: Failed to navigate"


# Execute the command

result = await base_test_case.browser_control.receive_command("navigate_to_website",
site=url)


# Log and assert the outcomes

logging.info(f"Control Layer Expected: {expected_control_result}")

logging.info(f"Control Layer Received: {result}")

assert result == expected_control_result, "Control layer failed to handle entity error correctly."

logging.info("Unit Test Passed for entity layer error handling.")


async def test_navigate_to_website_launch_browser_on_failure(base_test_case):

    # This test simulates a scenario where the browser is not open and needs to be launched first.

    with patch('entity.BrowserEntity.BrowserEntity.is_browser_open', return_value=False), \

        patch('entity.BrowserEntity.BrowserEntity.launch_browser', return_value="Browser
launched."), \

        patch('entity.BrowserEntity.BrowserEntity.navigate_to_website') as mock_navigate:

        # Setup expected outcomes

        url = "https://example.com"

        mock_navigate.return_value = f"Navigated to {url}"

        expected_control_result = f"Control Object Result: Navigated to {url}"

```

```
# Execute the command
```

```
    result = await base_test_case.browser_control.receive_command("navigate_to_website",  
site=url)
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer with browser launch.\n")
```

```
async def test_navigate_to_website_failure_control(base_test_case):
```

```
    # This simulates a failure within the control layer
```

```
        with patch('control.BrowserControl.BrowserControl.receive_command',
```

```
side_effect=Exception("Control Layer Failed")) as mock_control:
```

```
    # Setup expected outcomes
```

```
    url = "https://example.com"
```

```
    expected_control_result = "Control Layer Exception: Control Layer Failed"
```

```
    # Execute the command and catch the raised exception
```

```
    try:
```

```
        result = await base_test_case.browser_control.receive_command("navigate_to_website",  
site=url)
```

```
    except Exception as e:
```

```
        result = f"Control Layer Exception: {str(e)}"
```

```

# Log and assert the outcomes

logging.info(f"Control Layer Expected: {expected_control_result}")

logging.info(f"Control Layer Received: {result}")

assert result == expected_control_result, "Control layer assertion failed."

logging.info("Unit Test Passed for control layer failure.")


if __name__ == "__main__":

    pytest.main([__file__])


--- unitTest_project_help.py ---

import pytest, logging

from unittest.mock import patch

from test_init import base_test_case, setup_logging, log_test_start_end


# Enable asyncio for all tests in this file

pytestmark = pytest.mark.asyncio

setup_logging()


async def test_project_help_success(base_test_case):

    with patch('control.BotControl.BotControl.receive_command') as mock_help:

        # Setup mock return and expected outcomes

        mock_help.return_value = (

            "Here are the available commands:\n"

            "!project_help - Get help on available commands.\n"

            "!fetch_all_accounts - Fetch all stored accounts.\n"

            "!add_account 'username' 'password' 'website' - Add a new account to the database.\n"

            "!fetch_account_by_website 'website' - Fetch account details by website.\n"

```

"!delete\_account 'account\_id' - Delete an account by its ID.\n"

"!launch\_browser - Launch the browser.\n"

"!close\_browser - Close the browser.\n"

"!navigate\_to\_website 'url' - Navigate to a specified website.\n"

"!login 'website' - Log in to a website (e.g., !login bestbuy).\n"

"!get\_price 'url' - Check the price of a product on a specified website.\n"

"!start\_monitoring\_price 'url' 'frequency' - Start monitoring a product's price at a specific interval (frequency in minutes).\n"

"!stop\_monitoring\_price - Stop monitoring the product's price.\n"

"!check\_availability 'url' - Check availability for a restaurant or service.\n"

"!start\_monitoring\_availability 'url' 'frequency' - Monitor availability at a specific interval.\n"

"!stop\_monitoring\_availability - Stop monitoring availability.\n"

"!stop\_bot - Stop the bot.\n"

)

expected\_result = mock\_help.return\_value

# Execute the command

result = await base\_test\_case.bot\_control.receive\_command("project\_help")

# Log and assert the outcomes

logging.info(f"Control Layer Expected: {expected\_result}")

logging.info(f"Control Layer Received: {result}")

assert result == expected\_result, "Control layer assertion failed."

logging.info("Unit Test Passed for project help.\n")

async def test\_project\_help\_failure(base\_test\_case):



```

        with patch('control.BotControl.BotControl.receive_command', side_effect=Exception("Error
handling help command")) as mock_help:

    expected_result = "Error handling help command: Error handling help command"

    # Execute the command and catch the raised exception

    try:

        result = await base_test_case.bot_control.receive_command("project_help")

    except Exception as e:

        result = f"Error handling help command: {str(e)}"

    # Log and assert the outcomes

    logging.info(f"Control Layer Expected: {expected_result}")

    logging.info(f"Control Layer Received: {result}")

    assert result == expected_result, "Control layer failed to handle error correctly."

    logging.info("Unit Test Passed for error handling in project help.\n")

if __name__ == "__main__":

    pytest.main([__file__])

--- unitTest_start_monitoring_availability.py ---

import pytest, logging

from unittest.mock import patch

from test_init import base_test_case, setup_logging, run_monitoring_loop, log_test_start_end

import asyncio

# Enable asyncio for all tests in this file

```

```
pytestmark = pytest.mark.asyncio
```

```
setup_logging()
```

```
async def test_start_monitoring_availability_success(base_test_case):
```

```
    with patch('entity.AvailabilityEntity.AvailabilityEntity.check_availability') as mock_check:
```

```
        url = "https://example.com"
```

```
        mock_check.return_value = "Selected or default date is available for booking."
```

```
        expected_control_result = [
```

```
            "Checked availability: Selected or default date is available for booking.",
```

```
            "Monitoring stopped successfully!"
```

```
        ]
```

```
        # Run the monitoring loop once
```

```
        actual_control_result = await run_monitoring_loop(
```

```
            base_test_case.availability_control,
```

```
            base_test_case.availability_control.check_availability,
```

```
            url,
```

```
            "2024-10-01",
```

```
            1
```

```
        )
```

```
        logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
        logging.info(f"Control Layer Received: {actual_control_result}")
```

```
        assert actual_control_result == expected_control_result, "Control layer assertion failed."
```

```
        logging.info("Unit Test Passed for control layer.")
```

```

async def test_start_monitoring_availability_failure_entity(base_test_case):
    with patch('entity.AvailabilityEntity.AvailabilityEntity.check_availability',
side_effect=Exception("Failed to check availability")):

        url = "https://example.com"

        expected_control_result = [
            "Failed to check availability: Failed to check availability",
            "Monitoring stopped successfully!"
        ]

        # Run the monitoring loop once

        actual_control_result = await run_monitoring_loop(
            base_test_case.availability_control,
            base_test_case.availability_control.check_availability,
            url,
            "2024-10-01",
            1
        )

        logging.info(f"Control Layer Expected: {expected_control_result}")
        logging.info(f"Control Layer Received: {actual_control_result}")

        assert actual_control_result == expected_control_result, "Control layer failed to handle entity
error correctly."

        logging.info("Unit Test Passed for entity layer error handling.")

async def test_start_monitoring_availability_failure_control(base_test_case):

```

```

        with patch('control.AvailabilityControl.AvailabilityControl.receive_command',
side_effect=Exception("Control Layer Failed")):

    url = "https://example.com"

    expected_control_result = "Control Layer Exception: Control Layer Failed"

    try:

        result = await

base_test_case.availability_control.receive_command("start_monitoring_availability", url,
"2024-10-01", 5)

    except Exception as e:

        result = f"Control Layer Exception: {str(e)}"

    logging.info(f"Control Layer Expected: {expected_control_result}")

    logging.info(f"Control Layer Received: {result}")

    assert result == expected_control_result, "Control layer assertion failed."

    logging.info("Unit Test Passed for control layer failure.")

```

```

async def test_start_monitoring_availability_already_running(base_test_case):

    with patch('entity.AvailabilityEntity.AvailabilityEntity.check_availability') as mock_check:

        url = "https://example.com"

        base_test_case.availability_control.is_monitoring = True

        expected_control_result = "Already monitoring availability."

        result = await

base_test_case.availability_control.receive_command("start_monitoring_availability", url,
"2024-10-01", 5)

```

```
logging.info(f"Control Layer Expected: {expected_control_result}")

logging.info(f"Control Layer Received: {result}")

    assert result == expected_control_result, "Control layer failed to handle already running
condition."

logging.info("Unit Test Passed for control layer already running handling.\n")
```

```
if __name__ == "__main__":

    pytest.main([__file__])
```

```
--- unitTest_start_monitoring_price.py ---
```

```
import pytest
```

```
import logging
```

```
from unittest.mock import patch, AsyncMock
```

```
from test_init import base_test_case, setup_logging, log_test_start_end
```

```
# Enable asyncio for all tests in this file
```

```
pytestmark = pytest.mark.asyncio
```

```
setup_logging()
```

```
async def test_start_monitoring_price_success(base_test_case):
```

```
    with patch('entity.PriceEntity.PriceEntity.get_price_from_page', return_value="100 USD") as
mock_get_price:
```

```

# Setup expected outcomes

url = "https://example.com/product"

expected_result = "Starting price monitoring. Current price: 100 USD"


# Mocking the sleep method to break out of the loop after the first iteration
with patch('asyncio.sleep', side_effect=KeyboardInterrupt):

    try:

        # Execute the command

        base_test_case.price_control.is_monitoring = False

        result = await base_test_case.price_control.receive_command("start_monitoring_price",
url, 1)

    except KeyboardInterrupt:

        # Force the loop to stop after the first iteration

        base_test_case.price_control.is_monitoring = False


# Log and assert the outcomes

logging.info(f"Entity Layer Expected: {expected_result}")

logging.info(f"Control Layer Received: {base_test_case.price_control.results[0]}")

assert expected_result in base_test_case.price_control.results[0], "Price monitoring did not
start as expected."

logging.info("Unit Test Passed for start_monitoring_price success scenario.\n")


async def test_start_monitoring_price_already_running(base_test_case):

    # Test when price monitoring is already running

    base_test_case.price_control.is_monitoring = True

    expected_result = "Already monitoring prices."

```

```

# Execute the command

    result = await base_test_case.price_control.receive_command("start_monitoring_price",
"https://example.com/product", 1)

# Log and assert the outcomes

logging.info(f"Control Layer Expected: {expected_result}")

logging.info(f"Control Layer Received: {result}")

    assert result == expected_result, "Control layer did not detect that monitoring was already
running."

    logging.info("Unit Test Passed for already running scenario.\n")


async def test_start_monitoring_price_failure_in_entity(base_test_case):

    # Mock entity failure during price fetching

        with patch('entity.PriceEntity.PriceEntity.get_price_from_page', side_effect=Exception("Error
fetching price")) as mock_get_price:

# Setup expected outcomes

url = "https://example.com/product"

    expected_result = "Starting price monitoring. Current price: Failed to fetch price: Error fetching
price"

# Mocking the sleep method to break out of the loop after the first iteration

with patch('asyncio.sleep', side_effect=KeyboardInterrupt):

    try:

        # Execute the command

```

```

        base_test_case.price_control.is_monitoring = False

        await base_test_case.price_control.receive_command("start_monitoring_price", url, 1)

    except KeyboardInterrupt:

        # Force the loop to stop after the first iteration

        base_test_case.price_control.is_monitoring = False


# Log and assert the outcomes
logging.info(f"Control Layer Expected: {expected_result}")

logging.info(f"Control Layer Received: {base_test_case.price_control.results[-1]}")

assert expected_result in base_test_case.price_control.results[-1], "Entity layer did not handle
failure correctly."

logging.info("Unit Test Passed for entity layer failure scenario.\n")


async def test_start_monitoring_price_failure_in_control(base_test_case):

    # Mock control layer failure

    with patch('control.PriceControl.PriceControl.start_monitoring_price',
side_effect=Exception("Control Layer Exception")) as mock_start_monitoring:

        # Setup expected outcomes

        expected_result = "Control Layer Exception"


        # Execute the command and catch the raised exception

        try:

            result = await base_test_case.price_control.receive_command("start_monitoring_price",
"https://example.com/product", 1)

        except Exception as e:

```



```
result = f"Control Layer Exception: {str(e)}"
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected: {expected_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert expected_result in result, "Control layer did not handle the failure correctly."
```

```
logging.info("Unit Test Passed for control layer failure scenario.\n")
```

```
if __name__ == "__main__":
```

```
    pytest.main([__file__])
```

```
--- unitTest_stop_bot.py ---
```

```
import pytest
```

```
import logging
```

```
from unittest.mock import MagicMock, patch
```

```
from test_init import base_test_case, setup_logging, log_test_start_end
```

```
# Enable asyncio for all tests in this file
```

```
pytestmark = pytest.mark.asyncio
```

```
setup_logging()
```

```
async def test_stop_bot_success(base_test_case):
```

```
    with patch('control.BotControl.BotControl.receive_command') as mock_stop_bot:
```

```
        # Setup mock return and expected outcomes
```

```
mock_stop_bot.return_value = "Bot has been shut down."
```

```
expected_entity_result = "Bot has been shut down."
```

```
expected_control_result = "Bot has been shut down."
```

```
# Execute the command
```

```
result = await base_test_case.bot_control.receive_command("stop_bot", ctx=MagicMock())
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed."
```

```
logging.info("Unit Test Passed for control layer stop bot.\n")
```

```
async def test_stop_bot_failure_control(base_test_case):
```

```
    with patch('control.BotControl.BotControl.receive_command', side_effect=Exception("Control Layer Failed")) as mock_control:
```

```
        # Setup expected outcomes
```

```
        expected_control_result = "Control Layer Exception: Control Layer Failed"
```

```
# Execute the command and catch the raised exception
```

```
try:
```

```
    result = await base_test_case.bot_control.receive_command("stop_bot", ctx=MagicMock())
```

```
except Exception as e:
```

```
    result = f"Control Layer Exception: {str(e)}"
```

```

# Log and assert the outcomes

logging.info(f"Control Layer Expected: {expected_control_result}")

logging.info(f"Control Layer Received: {result}")

assert result == expected_control_result, "Control layer assertion failed."

logging.info("Unit Test Passed for control layer failure.\n")


if __name__ == "__main__":

    pytest.main([__file__])


--- unitTest_stop_monitoring_availability.py ---

import pytest, logging

from unittest.mock import patch

from test_init import base_test_case, setup_logging, log_test_start_end

import asyncio


# Enable asyncio for all tests in this file

pytestmark = pytest.mark.asyncio

setup_logging()


async def test_stop_monitoring_availability_success(base_test_case):

    # Simulate the case where monitoring is already running

    base_test_case.availability_control.is_monitoring = True

    base_test_case.availability_control.results = ["Checked availability: Selected or default date is
available for booking."]

```

```
# Expected message to be present in the result
```

```
expected_control_result_contains = "Monitoring stopped successfully!"
```

```
# Execute the stop command
```

```
result = base_test_case.availability_control.stop_monitoring_availability()
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected to contain: {expected_control_result_contains}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
    assert expected_control_result_contains in result, "Control layer assertion failed for stop  
monitoring."
```

```
logging.info("Unit Test Passed for stop monitoring availability.")
```

```
async def test_stop_monitoring_availability_no_active_session(base_test_case):
```

```
    # Simulate the case where no monitoring session is active
```

```
    base_test_case.availability_control.is_monitoring = False
```

```
    expected_control_result = "There was no active availability monitoring session. Nothing to stop."
```

```
# Execute the stop command
```

```
result = base_test_case.availability_control.stop_monitoring_availability()
```

```
# Log and assert the outcomes
```

```
logging.info(f"Control Layer Expected: {expected_control_result}")
```

```
logging.info(f"Control Layer Received: {result}")
```

```
assert result == expected_control_result, "Control layer assertion failed for no active session."
```

```
logging.info("Unit Test Passed for stop monitoring with no active session.")
```

```
if __name__ == "__main__":
```

```
    pytest.main([__file__])
```

```
--- unitTest_stop_monitoring_price.py ---
```

```
import pytest
```

```
import logging
```

```
from unittest.mock import patch, AsyncMock
```

```
from test_init import base_test_case, setup_logging, log_test_start_end
```

```
# Enable asyncio for all tests in this file
```

```
pytestmark = pytest.mark.asyncio
```

```
setup_logging()
```

```
async def test_stop_monitoring_price_success(base_test_case):
```

```
    # Set up monitoring to be active
```

```
    base_test_case.price_control.is_monitoring = True
```

```
    base_test_case.price_control.results = ["Price went up!", "Price went down!"]
```

```
    # Expected result after stopping monitoring
```

```
    expected_result = "Results for price monitoring:\nPrice went up!\nPrice went down!\n\nPrice  
monitoring stopped successfully!"
```

```
    # Execute the command
```

```
    result = base_test_case.price_control.stop_monitoring_price()
```

```

# Log and assert the outcomes

logging.info(f"Control Layer Expected: {expected_result}")

logging.info(f"Control Layer Received: {result}")

    assert result == expected_result, "Control layer did not return the correct results for stopping
monitoring."

    logging.info("Unit Test Passed for stop_monitoring_price success scenario.\n")


async def test_stop_monitoring_price_not_active(base_test_case):

    # Test the case where monitoring is not active

    base_test_case.price_control.is_monitoring = False

    expected_result = "There was no active price monitoring session. Nothing to stop."


    # Execute the command

    result = base_test_case.price_control.stop_monitoring_price()


    # Log and assert the outcomes

    logging.info(f"Control Layer Expected: {expected_result}")

    logging.info(f"Control Layer Received: {result}")

    assert result == expected_result, "Control layer did not detect that monitoring was not active."

    logging.info("Unit Test Passed for stop_monitoring_price when not active.\n")


async def test_stop_monitoring_price_failure_in_control(base_test_case):

    # Simulate failure in control layer during stopping of monitoring

    with patch('control.PriceControl.PriceControl.stop_monitoring_price', side_effect=Exception("Error
stopping price monitoring")) as mock_stop_monitoring:

```

```

# Expected result when the control layer fails

expected_result = "Error stopping price monitoring"


# Execute the command and handle exception

try:

    result = base_test_case.price_control.stop_monitoring_price()

except Exception as e:

    result = str(e)


# Log and assert the outcomes

logging.info(f"Control Layer Expected: {expected_result}")

logging.info(f"Control Layer Received: {result}")

assert expected_result in result, "Control layer did not handle the failure correctly."

logging.info("Unit Test Passed for stop_monitoring_price failure scenario.\n")

```

```

if __name__ == "__main__":

    pytest.main([__file__])

```

--- Config.py ---

#ignored not pushed to git!

class Config:

```

DISCORD_TOKEN =

'MTI2OTM4MTE4OTA1NjMzNTk3Mw.GJdUct.-2RsoynZh78VFGdoXdrXWFhFQPbUCHM7V2w-u8'

CHANNEL_ID = 1269383349278081054

```

```
DATABASE_PASSWORD = 'postgres'
```

```
--- css_selectors.py ---
```

```
class Selectors:
```

```
    SELECTORS = {
```

```
        "google": {
```

```
            "url": "https://www.google.com/"
```

```
        },
```

```
        "ebay": {
```

```
            "url": "https://signin.ebay.com/signin/",
```

```
            "email_field": "#userid",
```

```
            "continue_button": "[data-testid='signin-continue-btn']",
```

```
            "password_field": "#pass",
```

```
            "login_button": "#sgnBt",
```

```
            "price": ".x-price-primary span" # CSS selector for Ebay price
```

```
        },
```

```
        "bestbuy": {
```

```
            "priceUrl":
```

```
"https://www.bestbuy.com/site/microsoft-xbox-wireless-controller-for-xbox-series-x-xbox-series-s-xb
```

```
ox-one-windows-devices-sky-cipher-special-edition/6584960.p?skuld=6584960",
```

```
            "url": "https://www.bestbuy.com/signin/",
```

```
            "email_field": "#fld-e",
```

```
            "#continue_button": ".cia-form__controls button",
```

```
            "password_field": "#fld-p1",
```

```
            "SignIn_button": ".cia-form__controls button",
```

```
            "price": "[data-testid='customer-price'] span", # CSS selector for BestBuy price
```

```
            "homePage": ".v-p-right-xxs.line-clamp"
```



```
},
```

```
"opentable": {
```

```
    "url": "https://www.opentable.com/",
```

```
    "unavailableUrl": "https://www.opentable.com/r/bar-spero-washington/",
```

```
    "availableUrl": "https://www.opentable.com/r/the-rux-nashville",
```

```
    "availableUrl2": "https://www.opentable.com/r/hals-the-steakhouse-nashville",
```

```
    "date_field": "#restProfileSideBarDtpDayPicker-label",
```

```
    "time_field": "#restProfileSideBarTimePickerDtpPicker",
```

```
    "select_date": "#restProfileSideBarDtpDayPicker-wrapper", # button[aria-label*="{ }"]
```

```
    "select_time": "h3[data-test='select-time-header']",
```

```
    "no_availability": "div._8ye6OVzeOuU- span",
```

```
    "find_table_button": ".find-table-button", # Example selector for the Find Table button
```

```
    "availability_result": ".availability-result", # Example selector for availability results
```

```
        "show_next_available_button": "button[data-test='multi-day-availability-button']", # Show
```

```
next available button
```

```
    "available_dates": "ul[data-test='time-slots'] > li", # Available dates and times
```

```
}
```

```
}
```

```
@staticmethod
```

```
def get_selectors_for_url(url):
```

```
    for keyword, selectors in Selectors.SELECTORS.items():
```

```
        if keyword in url.lower():
```

```
            return selectors
```

```
    return None # Return None if no matching selectors are found
```

```
--- exportUtils.py ---
```

```
import os
```

```
import pandas as pd
```

```
from datetime import datetime
```

```
class ExportUtils:
```

```
    @staticmethod
```

```
    def log_to_excel(command, url, result, entered_date=None, entered_time=None):
```

```
        # Determine the file path for the Excel file
```

```
        file_name = f"{command}.xlsx"
```

```
        file_path = os.path.join("ExportedFiles", "excelFiles", file_name)
```

```
        # Ensure directory exists
```

```
        os.makedirs(os.path.dirname(file_path), exist_ok=True)
```

```
        # Timestamp for current run
```

```
        timestamp = datetime.now().strftime('%Y-%m-%d %H:%M:%S')
```

```
        # If date/time not entered, use current timestamp
```

```
        entered_date = entered_date or datetime.now().strftime('%Y-%m-%d')
```

```
        entered_time = entered_time or datetime.now().strftime('%H:%M:%S')
```

```
        # Check if the file exists and create the structure if it doesn't
```

```
        if not os.path.exists(file_path):
```

```
            df = pd.DataFrame(columns=["Timestamp", "Command", "URL", "Result", "Entered Date",  
"Entered Time"])
```

```
df.to_excel(file_path, index=False)
```

```
# Load existing data from the Excel file
```

```
df = pd.read_excel(file_path)
```

```
# Append the new row
```

```
new_row = {  
    "Timestamp": timestamp,  
    "Command": command,  
    "URL": url,  
    "Result": result,  
    "Entered Date": entered_date,  
    "Entered Time": entered_time  
}
```

```
# Add the new row to the existing data and save it back to Excel
```

```
df = pd.concat([df, pd.DataFrame([new_row])], ignore_index=True)
```

```
df.to_excel(file_path, index=False)
```

```
return f"Data saved to Excel file at {file_path}."
```

```
@staticmethod
```

```
def export_to_html(command, url, result, entered_date=None, entered_time=None):
```

```
    """Export data to HTML format with the same structure as Excel."""
```

```
# Define file path for HTML
```

```
file_name = f"{command}.html"
```

```
file_path = os.path.join("ExportedFiles", "htmlFiles", file_name)
```

```
# Ensure directory exists
```

```
os.makedirs(os.path.dirname(file_path), exist_ok=True)
```

```
# Timestamp for current run
```

```
timestamp = datetime.now().strftime('%Y-%m-%d %H:%M:%S')
```

```
# If date/time not entered, use current timestamp
```

```
entered_date = entered_date or datetime.now().strftime('%Y-%m-%d')
```

```
entered_time = entered_time or datetime.now().strftime('%H:%M:%S')
```

```
# Data row to insert
```

```
new_row = {
```

```
    "Timestamp": timestamp,
```

```
    "Command": command,
```

```
    "URL": url,
```

```
    "Result": result,
```

```
    "Entered Date": entered_date,
```

```
    "Entered Time": entered_time
```

```
}
```

```
# Check if the HTML file exists and append rows
```

```
if os.path.exists(file_path):
```

```
    # Open the file and append rows
```

```
    with open(file_path, "r+", encoding="utf-8") as file:
```

```
        content = file.read()
```

```
# Look for the closing </table> tag and append new rows before it
```

```
if "</table>" in content:
```

```
new_row_html = f"<tr><td>{new_row['Timestamp']}
```

```
content = content.replace("</table>", new_row_html + "</table>")
```

```
file.seek(0) # Move pointer to the start
```

```
file.write(content)
```

```
file.truncate() # Truncate any remaining content
```

```
file.flush() # Flush the buffer to ensure it's written
```

```
else:
```

```
# If the file doesn't exist, create a new one with table headers
```

```
with open(file_path, "w", encoding="utf-8") as file:
```

```
html_content = "<html><head><title>Command Data</title></head><body>"
```

```
html_content += f"<h1>Results for {command}</h1><table border='1'>"
```

```
html_content += f"<tr><th>Timestamp</th><th>Command</th><th>URL</th><th>Result</th><th>Entered Date</th><th>Entered Time</th></tr>"
```

```
html_content += f"<tr><td>{new_row['Timestamp']}
```

```
html_content += "</table></body></html>"
```

```
file.write(html_content)
```

```
file.flush() # Ensure content is written to disk
```

```
return f"HTML file saved and updated at {file_path}."
```

```
--- MyBot.py ---
```

```
import discord
```

```
from discord.ext import commands
```

```
from boundary.BrowserBoundary import BrowserBoundary
```

```
from boundary.AccountBoundary import AccountBoundary
```

```
from boundary.AvailabilityBoundary import AvailabilityBoundary
```

```
from boundary.PriceBoundary import PriceBoundary
```

```
from boundary.BotBoundary import BotBoundary
```

```
from DataObjects.global_vars import GlobalState # Import the global variable
```

```
# Bot initialization
```

```
intents = discord.Intents.default()
```

```
intents.message_content = True # Enable reading message content
```

```
class MyBot(commands.Bot):
```

```
    def __init__(self, *args, **kwargs):
```

```
        super().__init__(*args, **kwargs)
```

```
    async def on_message(self, message):
```

```
        if message.author == self.user: # Prevent the bot from replying to its own messages
```

```
            return
```

```
        print(f"Message received: {message.content}")
```

```
GlobalState.user_message = message.content
```

```
if GlobalState.user_message.lower() in ["hi", "hey", "hello"]:
```

```
    await message.channel.send("Hi, how can I help you?")
```

```
elif GlobalState.user_message.startswith("!"):
```

```
    print("User message: ", GlobalState.user_message)
```

```
else:
```

```
    await message.channel.send("I'm sorry, I didn't understand that. Type !project_help to see  
the list of commands.")
```

```
await self.process_commands(message)
```

```
GlobalState.reset_user_message() # Reset the global user_message variable
```

```
#print("User_message reset to empty string")
```

```
async def setup_hook(self):
```

```
    await self.add_cog(BrowserBoundary()) # Add your boundary objects
```

```
    await self.add_cog(AccountBoundary())
```

```
    await self.add_cog(AvailabilityBoundary())
```

```
    await self.add_cog(PriceBoundary())
```

```
    await self.add_cog(BotBoundary())
```

```
async def on_ready(self):
```

```
    print(f"Logged in as {self.user}")
```

```
        channel = discord.utils.get(self.get_all_channels(), name="general") # Adjust the channel  
name if needed
```

```
if channel:
```

```
    await channel.send("Hi, I'm online! Type '!project_help' to see what I can do.")
```

```
async def on_command_error(self, ctx, error):
```

```
    if isinstance(error, commands.CommandNotFound):
```

```
        print("Command not recognized:")
```

```
        print(error)
```

```
        await ctx.channel.send("I'm sorry, I didn't understand that. Type !project_help to see the list  
of commands.")
```

```
# Initialize the bot instance
```

```
bot = MyBot(command_prefix="!", intents=intents, case_insensitive=True)
```

```
def start_bot(token):
```

```
    """Run the bot with the provided token."""
```

```
    bot.run(token)
```