```
--- test_!add_account.py ---
# File: test_!add_account.py
# Purpose: Unit tests for the !add_account command.

from unittest.mock import patch
import logging, unittest
from test_init import BaseTestSetup, CustomTextTestRunner  # Import the shared setup

"""
File: test_!add_account.py
Purpose: This file contains unit tests for the !add_account command in the Discord bot.
The tests validate both successful and error scenarios, ensuring the account is added successfully
or errors are handled properly.
Tests:
- Positive: Simulates the !add_account command and verifies the account is added correctly.
- Negative: Simulates an error while adding the account.
"""

class TestAddAccountCommand(BaseTestSetup):

    @patch('DataObjects.AccountDAO.AccountDAO.add_account')
    async def test_add_account_success(self, mock_add_account):
        """Test the add_account command when it succeeds."""
        logging.info("Starting test: test_add_account_success")

        # Mock the DAO method to simulate successful account addition
        mock_add_account.return_value = True
```

```
        command = self.bot.get_command("add_account")
        self.assertIsNotNone(command)
        await command(self.ctx, "testuser", "password123", "example.com")

        expected_message = "Account for example.com added successfully."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified successful account addition.")

    @patch('DataObjects.AccountDAO.AccountDAO.add_account')
    async def test_add_account_error(self, mock_add_account):
        """Test the add_account command when it encounters an error."""
        logging.info("Starting test: test_add_account_error")

        # Mock the DAO method to simulate an error during account addition
        mock_add_account.return_value = False

        command = self.bot.get_command("add_account")
        await command(self.ctx, "testuser", "password123", "example.com")

        self.ctx.send.assert_called_with("Failed to add account for example.com.")
        logging.info("Verified error handling during account addition.")

if __name__ == "__main__":
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))
```

```
--- test_!check_availability.py ---
import logging, unittest
from unittest.mock import patch
from test_init import BaseTestSetup, CustomTextTestRunner

"""
File: test_!check_availability.py
Purpose: Unit tests for the !check_availability command in the Discord bot.
"""

class TestCheckAvailabilityCommand(BaseTestSetup):

    @patch('control.AvailabilityControl.AvailabilityControl.receive_command')
    async def test_check_availability_success(self, mock_receive_command):
        """Test the check_availability command when it succeeds."""
        logging.info("Starting test: test_check_availability_success")

        mock_receive_command.return_value = "Available for booking."

        command = self.bot.get_command("check_availability")
        self.assertIsNotNone(command)

        await command(self.ctx, "https://example.com", "2024-09-30")
        expected_message = "Available for booking."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified successful availability check.")
```

```
    @patch('control.AvailabilityControl.AvailabilityControl.receive_command')
    async def test_check_availability_error(self, mock_receive_command):
        """Test the check_availability command when it encounters an error."""
        logging.info("Starting test: test_check_availability_error")

        mock_receive_command.return_value = "No availability found."

        command = self.bot.get_command("check_availability")
        self.assertIsNotNone(command)

        await command(self.ctx, "https://invalid-url.com", "2024-09-30")
        expected_message = "No availability found."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified error handling during availability check.")

if __name__ == "__main__":
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))



--- test_!close_browser.py ---
import logging, unittest
from unittest.mock import patch
from test_init import BaseTestSetup, CustomTextTestRunner

"""
File: test_!close_browser.py
Purpose: This file contains unit tests for the !close_browser command in the Discord bot.
```

The tests validate both successful and error scenarios, ensuring the browser closes properly or errors are handled gracefully.

Tests:
- Positive: Simulates the !close_browser command and verifies the browser closes correctly.
- Negative: Simulates an error during browser closure and ensures it is handled gracefully.
"""

```
class TestCloseBrowserCommand(BaseTestSetup):

    @patch('entity.BrowserEntity.BrowserEntity.close_browser')
    async def test_close_browser_success(self, mock_close_browser):
        """Test the close_browser command when it succeeds."""
        logging.info("Starting test: test_close_browser_success")

        # Simulate successful browser closure
        mock_close_browser.return_value = "Browser closed."

        # Retrieve the close_browser command from the bot
        command = self.bot.get_command("close_browser")
        self.assertIsNotNone(command)

        # Call the command
        await command(self.ctx)

        # Verify the expected message was sent to the user
        expected_message = "Browser closed."
```

```
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified successful browser closure.")

    @patch('entity.BrowserEntity.BrowserEntity.close_browser')
    async def test_close_browser_error(self, mock_close_browser):
        """Test the close_browser command when it encounters an error."""
        logging.info("Starting test: test_close_browser_error")

        # Simulate a failure during browser closure
        mock_close_browser.side_effect = Exception("Failed to close browser")

        # Retrieve the close_browser command from the bot
        command = self.bot.get_command("close_browser")
        self.assertIsNotNone(command)

        # Call the command
        await command(self.ctx)

        # Verify the correct error message is sent
        self.ctx.send.assert_called_with("Failed to close browser")  # Error message handled
        logging.info("Verified error handling during browser closure.")


if __name__ == "__main__":
    # Use the custom test runner to display 'Unit test passed'
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))
```

```
--- test_!delete_account.py ---
import logging, unittest
from unittest.mock import patch
from test_init import BaseTestSetup, CustomTextTestRunner

"""
File: test_!delete_account.py
Purpose: This file contains unit tests for the !delete_account command in the Discord bot.
The tests validate both successful and error scenarios, ensuring the bot deletes the account properly or handles errors.
Tests:
- Positive: Simulates the !delete_account command and verifies the account is deleted successfully.
- Negative: Simulates an error during account deletion and ensures it is handled gracefully.
"""

class TestDeleteAccountCommand(BaseTestSetup):

    @patch('DataObjects.AccountDAO.AccountDAO.delete_account')
    async def test_delete_account_success(self, mock_delete_account):
        """Test the delete_account command when it succeeds."""
        logging.info("Starting test: test_delete_account_success")
        mock_delete_account.return_value = True  # Simulate successful deletion

        command = self.bot.get_command("delete_account")
        self.assertIsNotNone(command)
```

```
        await command(self.ctx, '123')  # Simulate passing account ID '123'

        expected_message = "Account with ID 123 deleted successfully."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified successful account deletion.")

    @patch('DataObjects.AccountDAO.AccountDAO.delete_account')
    async def test_delete_account_error(self, mock_delete_account):
        """Test the delete_account command when it encounters an error."""
        logging.info("Starting test: test_delete_account_error")
        mock_delete_account.return_value = False  # Simulate failure in deletion

        command = self.bot.get_command("delete_account")
        self.assertIsNotNone(command)

        await command(self.ctx, '999')  # Simulate passing a non-existent account ID '999'

        expected_message = "Failed to delete account with ID 999."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified error handling during account deletion.")

if __name__ == "__main__":
    # Use the custom test runner to display 'Unit test passed'
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))



--- test_!fetch_account_by_website.py ---
```

```
import unittest, logging
from unittest.mock import patch
from test_init import BaseTestSetup, CustomTextTestRunner

class TestFetchAccountByWebsiteCommand(BaseTestSetup):

    @patch('DataObjects.AccountDAO.AccountDAO.fetch_account_by_website')
    async def test_fetch_account_by_website_success(self, mock_fetch_account_by_website):
        """Test the fetch_account_by_website command when it succeeds."""
        logging.info("Starting test: test_fetch_account_by_website_success")
        mock_fetch_account_by_website.return_value = ('testuser', 'password123')

        command = self.bot.get_command("fetch_account_by_website")
        self.assertIsNotNone(command)

        await command(self.ctx, 'example.com')

        expected_message = 'testuser', 'password123'
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified successful account fetch.")

    @patch('DataObjects.AccountDAO.AccountDAO.fetch_account_by_website')
    async def test_fetch_account_by_website_error(self, mock_fetch_account_by_website):
        """Test the fetch_account_by_website command when it encounters an error."""
        logging.info("Starting test: test_fetch_account_by_website_error")
        mock_fetch_account_by_website.return_value = None
```

```
        command = self.bot.get_command("fetch_account_by_website")
        self.assertIsNotNone(command)

        await command(self.ctx, 'nonexistent.com')

        expected_message = 'No account found for nonexistent.com.'
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified error handling for nonexistent account.")

if __name__ == "__main__":
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))



--- test_!fetch_all_accounts.py ---
# File: test_!fetch_all_accounts.py
# Purpose: Unit tests for the !fetch_all_accounts command.
from unittest.mock import patch
import logging, unittest
from test_init import BaseTestSetup, CustomTextTestRunner

class TestFetchAllAccountsCommand(BaseTestSetup):
    @patch('DataObjects.AccountDAO.AccountDAO.fetch_all_accounts')
    async def test_fetch_all_accounts_success(self, mock_fetch_all_accounts):
        """Test the fetch_all_accounts command when it succeeds."""
        logging.info("Starting test: test_fetch_all_accounts_success")

        mock_fetch_all_accounts.return_value = [("1", "testuser", "password", "example.com")]
```

```
        command = self.bot.get_command("fetch_all_accounts")
        self.assertIsNotNone(command)
        await command(self.ctx)

        # Correct the expected message
          expected_message = "Accounts:\nID: 1, Username: testuser, Password: password, Website:
example.com"
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified successful fetch.")


    @patch('DataObjects.AccountDAO.AccountDAO.fetch_all_accounts')  # Correct path
    async def test_fetch_all_accounts_error(self, mock_fetch_all_accounts):
        """Test the fetch_all_accounts command when it encounters an error."""
        logging.info("Starting test: test_fetch_all_accounts_error")

        # Simulate an error
        mock_fetch_all_accounts.side_effect = Exception("Database error")

        command = self.bot.get_command("fetch_all_accounts")
        await command(self.ctx)

        # Verify that the correct error message is sent
        self.ctx.send.assert_called_with("Error fetching accounts.")
        logging.info("Verified error handling.")
```

```
if __name__ == "__main__":
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))



--- test_!get_price.py ---
import logging, unittest
from unittest.mock import patch
from test_init import BaseTestSetup, CustomTextTestRunner

"""
File: test_!get_price.py
Purpose: This file contains unit tests for the !get_price command in the Discord bot.
The tests validate both successful and error scenarios, ensuring that the price is fetched correctly or errors are handled.
"""

class TestGetPriceCommand(BaseTestSetup):
    @patch('control.PriceControl.PriceControl.receive_command')
    async def test_get_price_success(self, mock_receive_command):
        """Test the get_price command when it succeeds."""
        logging.info("Starting test: test_get_price_success")

        # Simulate successful price fetch
        mock_receive_command.return_value = "Price: $199.99"

        # Retrieve the get_price command from the bot
```

```
    command = self.bot.get_command("get_price")
    self.assertIsNotNone(command)

    # Call the command with a valid URL
    await command(self.ctx, "https://example.com")

    # Verify the expected message was sent to the user
    expected_message = "Price: $199.99"
    self.ctx.send.assert_called_with(expected_message)
    logging.info("Verified successful price fetch.")

@patch('control.PriceControl.PriceControl.receive_command')
async def test_get_price_error(self, mock_receive_command):
    """Test the get_price command when it encounters an error."""
    logging.info("Starting test: test_get_price_error")

    # Simulate a failure during price fetch
    mock_receive_command.return_value = "Failed to fetch price"

    # Retrieve the get_price command from the bot
    command = self.bot.get_command("get_price")
    self.assertIsNotNone(command)

    # Call the command with an invalid URL
    await command(self.ctx, "https://invalid-url.com")

    # Verify the correct error message is sent
```

```
        self.ctx.send.assert_called_with("Failed to fetch price")
        logging.info("Verified error handling during price fetch.")

if __name__ == "__main__":
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))



--- test_!launch_browser.py ---
import logging, unittest
from unittest.mock import patch
from test_init import BaseTestSetup, CustomTextTestRunner

"""
File: test_!launch_browser.py
Purpose: This file contains unit tests for the !launch_browser command in the Discord bot.
The tests validate both successful and error scenarios, ensuring the browser launches properly or errors are handled gracefully.

Tests:
- Positive: Simulates the !launch_browser command and verifies the browser launches correctly.
- Negative: Simulates an error during browser launch and ensures it is handled gracefully.
"""

class TestLaunchBrowserCommand(BaseTestSetup):

    @patch('entity.BrowserEntity.BrowserEntity.launch_browser')
    async def test_launch_browser_success(self, mock_launch_browser):
```

```
    """Test the launch_browser command when it succeeds."""
    logging.info("Starting test: test_launch_browser_success")

    # Simulate successful browser launch
    mock_launch_browser.return_value = "Browser launched."

    # Retrieve the launch_browser command from the bot
    command = self.bot.get_command("launch_browser")
    self.assertIsNotNone(command)

    # Call the command
    await command(self.ctx)

    # Verify the expected message was sent to the user
    expected_message = "Browser launched."
    self.ctx.send.assert_called_with(expected_message)
    logging.info("Verified successful browser launch.")

@patch('entity.BrowserEntity.BrowserEntity.launch_browser')
async def test_launch_browser_error(self, mock_launch_browser):
    """Test the launch_browser command when it encounters an error."""
    logging.info("Starting test: test_launch_browser_error")

    # Simulate a failure during browser launch
    mock_launch_browser.side_effect = Exception("Failed to launch browser")

    # Retrieve the launch_browser command from the bot
```

```
        command = self.bot.get_command("launch_browser")
        self.assertIsNotNone(command)

        # Call the command
        await command(self.ctx)

        # Verify the correct error message is sent
        self.ctx.send.assert_called_with("Failed to launch browser")  # Error message handled
        logging.info("Verified error handling during browser launch.")


if __name__ == "__main__":
    # Use the custom test runner to display 'Unit test passed'
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))


--- test_!login.py ---
import logging, unittest
from unittest.mock import patch, AsyncMock
from test_init import BaseTestSetup, CustomTextTestRunner

"""
File: test_!login.py
Purpose: Unit tests for the !login command in the Discord bot.
The tests validate both successful and error scenarios, ensuring the bot correctly logs in to a specified website or handles errors gracefully.
```

Tests:

- Positive: Simulates the !login command and verifies the login is successful.

- Negative: Simulates an error during login and ensures it is handled gracefully.

"""

```
class TestLoginCommand(BaseTestSetup):

    @patch('control.LoginControl.LoginControl.receive_command')
    async def test_login_success(self, mock_receive_command):
        """Test the login command when it succeeds."""
        logging.info("Starting test: test_login_success")

        # Simulate a successful login
        mock_receive_command.return_value = "Login successful."

        # Retrieve the login command from the bot
        command = self.bot.get_command("login")
        self.assertIsNotNone(command)

        # Call the command with a valid site (e.g., ebay)
        await command(self.ctx, "ebay")

        # Verify the expected message was sent to the user
        expected_message = "Login successful."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified successful login.")
```

```
    @patch('control.LoginControl.LoginControl.receive_command')
    async def test_login_error(self, mock_receive_command):
        """Test the login command when it encounters an error."""
        logging.info("Starting test: test_login_error")

        # Simulate a failure during login
        mock_receive_command.return_value = "Failed to login. No account found."

        # Retrieve the login command from the bot
        command = self.bot.get_command("login")
        self.assertIsNotNone(command)

        # Call the command with a non-existent site (e.g., nonexistent.com)
        await command(self.ctx, "nonexistent.com")

        # Verify the correct error message is sent
        self.ctx.send.assert_called_with("Failed to login. No account found.")
        logging.info("Verified error handling during login.")

if __name__ == "__main__":
    # Use the custom test runner to display 'Unit test passed'
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))



--- test_!monitor_availability.py ---
import logging, unittest
from unittest.mock import patch
```

```
from test_init import BaseTestSetup, CustomTextTestRunner

"""
File: test_!monitor_availability.py
Purpose: Unit tests for the !monitor_availability command in the Discord bot.
"""

class TestMonitorAvailabilityCommand(BaseTestSetup):

    @patch('control.AvailabilityControl.AvailabilityControl.receive_command')
    async def test_monitor_availability_success(self, mock_receive_command):
        """Test the monitor_availability command when it succeeds."""
        logging.info("Starting test: test_monitor_availability_success")

        mock_receive_command.return_value = "Monitoring started for https://example.com."

        command = self.bot.get_command("start_monitoring_availability")
        self.assertIsNotNone(command)

        await command(self.ctx, "https://example.com", "2024-09-30", 15)
        expected_message = "Monitoring started for https://example.com."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified successful availability monitoring start.")

    @patch('control.AvailabilityControl.AvailabilityControl.receive_command')
    async def test_monitor_availability_error(self, mock_receive_command):
        """Test the monitor_availability command when it encounters an error."""
```

```
        logging.info("Starting test: test_monitor_availability_error")

        mock_receive_command.return_value = "Failed to start monitoring."

        command = self.bot.get_command("start_monitoring_availability")
        self.assertIsNotNone(command)

        await command(self.ctx, "https://invalid-url.com", "2024-09-30", 15)
        expected_message = "Failed to start monitoring."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified error handling during availability monitoring.")

if __name__ == "__main__":
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))



--- test_!navigate_to_website.py ---
import logging, unittest
from unittest.mock import patch
from test_init import BaseTestSetup, CustomTextTestRunner

"""
File: test_!navigate_to_website.py
Purpose: This file contains unit tests for the !navigate_to_website command in the Discord bot.
The tests validate both successful and error scenarios, ensuring the bot navigates to the website correctly or handles errors.
"""
```

```
class TestNavigateToWebsiteCommand(BaseTestSetup):

    @patch('entity.BrowserEntity.BrowserEntity.navigate_to_website')
    async def test_navigate_to_website_success(self, mock_navigate_to_website):
        """Test the navigate_to_website command when it succeeds."""
        logging.info("Starting test: test_navigate_to_website_success")

        # Simulate successful navigation
        mock_navigate_to_website.return_value = "Navigated to https://example.com."

        # Retrieve the navigate_to_website command from the bot
        command = self.bot.get_command("navigate_to_website")
        self.assertIsNotNone(command)

        # Call the command
        await command(self.ctx, "https://example.com")

        # Verify the expected message was sent to the user
        expected_message = "Navigated to https://example.com."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified successful website navigation.")

    @patch('entity.BrowserEntity.BrowserEntity.navigate_to_website')
    async def test_navigate_to_website_error(self, mock_navigate_to_website):
        """Test the navigate_to_website command when it encounters an error."""
        logging.info("Starting test: test_navigate_to_website_error")
```

```
        # Simulate a failure during navigation
        mock_navigate_to_website.side_effect = Exception("Failed to navigate to the website.")

        # Retrieve the navigate_to_website command from the bot
        command = self.bot.get_command("navigate_to_website")
        self.assertIsNotNone(command)

        # Call the command
        await command(self.ctx, "https://invalid-url.com")

        # Verify the correct error message is sent
        self.ctx.send.assert_called_with("Failed to navigate to the website.")  # Error message handled
        logging.info("Verified error handling during website navigation.")

if __name__ == "__main__":
    # Use the custom test runner to display 'Unit test passed'
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))



--- test_!project_help.py ---
import logging, unittest
from test_init import BaseTestSetup, CustomTextTestRunner
from unittest.mock import call
"""
File: test_!project_help.py
Purpose: This file contains unit tests for the !project_help command in the Discord bot.
```

The tests validate both successful and error scenarios, ensuring the bot provides the correct help message and handles errors properly.

Tests:

- Positive: Simulates the !project_help command and verifies the correct help message is sent.

- Negative: Simulates an error scenario and ensures the error is handled gracefully.

"""

```
class TestStopBotCommand(BaseTestSetup):

    async def test_project_help_success(self):
        """Test the project help command when it successfully returns the help message."""
        logging.info("Starting test: test_project_help_success")

        # Simulate calling the project_help command
        logging.info("Simulating the project_help command call.")
        command = self.bot.get_command("project_help")
            self.assertIsNotNone(command, "project_help command is not registered.")  # Ensure the command is registered
        await command(self.ctx)

        # Check both the control message and help message were sent
        expected_calls = [
            call('Command recognized, passing data to control.'),  # First message sent by the bot
            call(help_message)  # Second message: the actual help message
        ]
         self.ctx.send.assert_has_calls(expected_calls, any_order=False)  # Ensure the messages are sent in the correct order
```

```
        logging.info("Verified that both the control and help messages were sent.")



    async def test_project_help_error(self):
        """Test the project help command when it encounters an error during execution."""
        logging.info("Starting test: test_project_help_error")

        # Simulate calling the project_help command and an error occurring
        logging.info("Simulating the project_help command call.")
            self.ctx.send.side_effect = Exception("Error during project_help execution.")  # Simulate an error

        command = self.bot.get_command("project_help")
            self.assertIsNotNone(command, "project_help command is not registered.")  # Ensure the command is registered

        # Act & Assert: Expect the exception to be raised
        with self.assertRaises(Exception):
            await command(self.ctx)

        logging.info("Verified that an error occurred and was handled.")

# Expected help message
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"
        )

if __name__ == "__main__":
    # Use the custom test runner to display 'Unit test passed'
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))
```

--- test_!start_monitoring_price.py ---

```
import logging, unittest
from unittest.mock import patch
from test_init import BaseTestSetup, CustomTextTestRunner
```

"""

File: test_!start_monitoring_price.py

Purpose: This file contains unit tests for the !start_monitoring_price command in the Discord bot. The tests validate both successful and error scenarios, ensuring that the bot starts monitoring prices or handles errors.

"""

```
class TestStartMonitoringPriceCommand(BaseTestSetup):
    @patch('control.PriceControl.PriceControl.receive_command')
    async def test_start_monitoring_price_success(self, mock_receive_command):
        """Test the start_monitoring_price command when it succeeds."""
        logging.info("Starting test: test_start_monitoring_price_success")

        # Simulate successful price monitoring start
        mock_receive_command.return_value = "Monitoring started for https://example.com."

        # Retrieve the start_monitoring_price command from the bot
        command = self.bot.get_command("start_monitoring_price")
        self.assertIsNotNone(command)

        # Call the command with a valid URL and frequency
        await command(self.ctx, "https://example.com", 20)

        # Verify the expected message was sent to the user
        expected_message = "Monitoring started for https://example.com."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified successful price monitoring start.")
```

```
    @patch('control.PriceControl.PriceControl.receive_command')
    async def test_start_monitoring_price_error(self, mock_receive_command):
        """Test the start_monitoring_price command when it encounters an error."""
        logging.info("Starting test: test_start_monitoring_price_error")

        # Simulate a failure during price monitoring start
        mock_receive_command.return_value = "Failed to start monitoring"

        # Retrieve the start_monitoring_price command from the bot
        command = self.bot.get_command("start_monitoring_price")
        self.assertIsNotNone(command)

        # Call the command with an invalid URL
        await command(self.ctx, "https://invalid-url.com", 20)

        # Verify the correct error message is sent
        self.ctx.send.assert_called_with("Failed to start monitoring")
        logging.info("Verified error handling during price monitoring start.")

if __name__ == "__main__":
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))



--- test_!stop_bot.py ---
import logging, unittest
from unittest.mock import AsyncMock, call, patch
```

```
from test_init import BaseTestSetup, CustomTextTestRunner

"""
File: test_!stop_bot.py
Purpose: This file contains unit tests for the !stop_bot command in the Discord bot.
The tests validate both successful and error scenarios, ensuring the bot correctly shuts down or handles errors during shutdown.
Tests:
- Positive: Simulates the !stop_bot command and verifies the bot shuts down correctly.
- Negative: Simulates an error during shutdown and ensures it is handled gracefully.
"""

class TestStopBotCommand(BaseTestSetup):

    async def test_stop_bot_success(self):
        """Test the stop bot command when it successfully shuts down."""
        logging.info("Starting test: test_stop_bot_success")

        # Patch the bot's close method on the ctx.bot (since bot is retrieved from ctx dynamically)
        with patch.object(self.ctx.bot, 'close', new_callable=AsyncMock) as mock_close:
            # Simulate calling the stop_bot command
            logging.info("Simulating the stop_bot command call.")
            command = self.bot.get_command("stop_bot")
                self.assertIsNotNone(command, "stop_bot command is not registered.")  # Ensure the command is registered
            await command(self.ctx)
```

```
        # Check if the correct messages were sent
        expected_calls = [
            call('Command recognized, passing data to control.'),  # First message sent by the bot
            call('The bot is shutting down...')  # Second message confirming the shutdown
        ]
            self.ctx.send.assert_has_calls(expected_calls, any_order=False)  # Ensure the messages are sent in the correct order
        logging.info("Verified that both expected messages were sent to the user.")

        # Check if bot.close() was called on the ctx.bot
        mock_close.assert_called_once()
        logging.info("Verified that the bot's close method was called once.")

    async def test_stop_bot_error(self):
        """Test the stop bot command when it encounters an error during shutdown."""
        logging.info("Starting test: test_stop_bot_error")

        # Patch the bot's close method to raise an exception
        with patch.object(self.ctx.bot, 'close', new_callable=AsyncMock) as mock_close:
            mock_close.side_effect = Exception("Error stopping bot")  # Simulate an error

            # Simulate calling the stop_bot command
            logging.info("Simulating the stop_bot command call.")
            command = self.bot.get_command("stop_bot")
                self.assertIsNotNone(command, "stop_bot command is not registered.")  # Ensure the command is registered
```

```
        # Act & Assert: Expect the exception to be raised
        with self.assertRaises(Exception):
            await command(self.ctx)

        logging.info("Verified that an error occurred and was handled correctly.")

        # Ensure ctx.send was still called with the shutdown message before the error occurred
        self.ctx.send.assert_called_with("The bot is shutting down...")
        logging.info("Verified that 'The bot is shutting down...' message was sent despite the error.")

        # Verify that the close method was still attempted
        mock_close.assert_called_once()
        logging.info("Verified that the bot's close method was called even though it raised an error.")

if __name__ == "__main__":
    # Use the custom test runner to display 'Unit test passed'
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))

--- test_!stop_monitoring_availability.py ---
import logging, unittest
from unittest.mock import patch
from test_init import BaseTestSetup, CustomTextTestRunner

"""
File: test_!stop_monitoring_availability.py
```

```
Purpose: Unit tests for the !stop_monitoring_availability command in the Discord bot.
"""

class TestStopMonitoringAvailabilityCommand(BaseTestSetup):

    @patch('control.AvailabilityControl.AvailabilityControl.receive_command')
    async def test_stop_monitoring_availability_no_active_session(self, mock_receive_command):
        """Test the stop_monitoring_availability command when no active session exists."""
        logging.info("Starting test: test_stop_monitoring_availability_no_active_session")

        mock_receive_command.return_value = "There was no active availability monitoring session."

        command = self.bot.get_command("stop_monitoring_availability")
        self.assertIsNotNone(command)

        await command(self.ctx)
        expected_message = "There was no active availability monitoring session."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified no active session stop scenario.")

    @patch('control.AvailabilityControl.AvailabilityControl.receive_command')
    async def test_stop_monitoring_availability_success(self, mock_receive_command):
        """Test the stop_monitoring_availability command when it succeeds."""
        logging.info("Starting test: test_stop_monitoring_availability_success")

        mock_receive_command.return_value = "Availability monitoring stopped successfully."
```

```
        command = self.bot.get_command("stop_monitoring_availability")
        self.assertIsNotNone(command)

        await command(self.ctx)
        expected_message = "Availability monitoring stopped successfully."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified successful availability monitoring stop.")

if __name__ == "__main__":
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))



--- test_!stop_monitoring_price.py ---
import logging, unittest
from unittest.mock import patch
from test_init import BaseTestSetup, CustomTextTestRunner

"""
File: test_!stop_monitoring_price.py
Purpose: This file contains unit tests for the !stop_monitoring_price command in the Discord bot.
The tests validate both successful and error scenarios, ensuring that the bot stops monitoring prices
or handles errors.
"""

class TestStopMonitoringPriceCommand(BaseTestSetup):

    @patch('control.PriceControl.PriceControl.receive_command')
```

```
    async def test_stop_monitoring_price_no_active_session(self, mock_receive_command):
        """Test the stop_monitoring_price command when no active monitoring session exists."""
        logging.info("Starting test: test_stop_monitoring_price_no_active_session")

        # Simulate scenario with no active price monitoring session
            mock_receive_command.return_value = "There was no active price monitoring session. Nothing to stop."

        # Retrieve the stop_monitoring_price command from the bot
        command = self.bot.get_command("stop_monitoring_price")
        self.assertIsNotNone(command)

        # Call the command
        await command(self.ctx)

        # Verify the expected message was sent to the user
        expected_message = "There was no active price monitoring session. Nothing to stop."
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified no active session stop scenario.")

    @patch('control.PriceControl.PriceControl.receive_command')
    async def test_stop_monitoring_price_success_with_results(self, mock_receive_command):
            """Test the stop_monitoring_price command when monitoring was active and results are returned."""
        logging.info("Starting test: test_stop_monitoring_price_success_with_results")

        # Simulate stopping monitoring and receiving results
```

```
        mock_receive_command.return_value = "Results for price monitoring:\nPrice: $199.99\nPrice monitoring stopped successfully!"

        # Retrieve the stop_monitoring_price command from the bot
        command = self.bot.get_command("stop_monitoring_price")
        self.assertIsNotNone(command)

        # Call the command
        await command(self.ctx)

        # Verify the expected message was sent to the user
        expected_message = "Results for price monitoring:\nPrice: $199.99\nPrice monitoring stopped successfully!"
        self.ctx.send.assert_called_with(expected_message)
        logging.info("Verified successful stop with results.")

    @patch('control.PriceControl.PriceControl.receive_command')
    async def test_stop_monitoring_price_error(self, mock_receive_command):
        """Test the stop_monitoring_price command when it encounters an error."""
        logging.info("Starting test: test_stop_monitoring_price_error")

        # Simulate a failure during price monitoring stop
        mock_receive_command.return_value = "Error stopping price monitoring"

        # Retrieve the stop_monitoring_price command from the bot
        command = self.bot.get_command("stop_monitoring_price")
        self.assertIsNotNone(command)
```

```
        # Call the command
        await command(self.ctx)

        # Verify the correct error message is sent
        self.ctx.send.assert_called_with("Error stopping price monitoring")
        logging.info("Verified error handling during price monitoring stop.")

if __name__ == "__main__":
    unittest.main(testRunner=CustomTextTestRunner(verbosity=2))



--- test_init.py ---
# Purpose: This file contains common setup code for all test cases.
import sys, os, discord, logging, unittest
sys.path.append(os.path.dirname(os.path.dirname(os.path.abspath(__file__))))
from unittest.mock import AsyncMock
from utils.MyBot import MyBot

# Setup logging configuration
logging.basicConfig(level=logging.INFO, format='%(asctime)s - %(levelname)s - %(message)s')

class CustomTextTestResult(unittest.TextTestResult):
    """Custom test result to output 'Unit test passed' instead of 'ok'."""
    def addSuccess(self, test):
        super().addSuccess(test)
        self.stream.write("Unit test passed\n")  # Custom success message
```

```
        self.stream.flush()


class CustomTextTestRunner(unittest.TextTestRunner):
    """Custom test runner that uses the custom result class."""
    resultclass = CustomTextTestResult


class BaseTestSetup(unittest.IsolatedAsyncioTestCase):
    """Base setup class for initializing bot and mock context for all tests."""


    async def asyncSetUp(self):
        """Setup the bot and mock context before each test."""
        logging.info("Setting up the bot and mock context for testing...")
        intents = discord.Intents.default()
        intents.message_content = True
        self.bot = MyBot(command_prefix="!", intents=intents)
        self.ctx = AsyncMock()
        self.ctx.send = AsyncMock()
        self.ctx.bot = self.bot  # Mock the bot property in the context
        await self.bot.setup_hook()  # Ensure commands are registered



--- __init__.py ---
#empty init file
```