ATDD Getting Started Guide

This is a very simple, very crude quick start guide to help ASD-200-CMP participants that are new to Robot Framework using Python. This is juuuuust enough to get you started. For real help with syntax and structure, refer to the Robot documentation at https://robotframework.org/

None of this code is perfect or ideal. It likely still needs cleanup or refactoring before you're "done". It is, hopefully, enough to get you started.

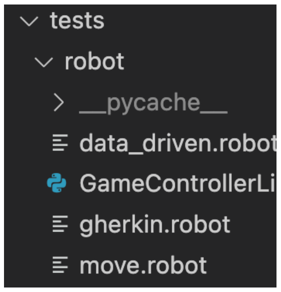
Python with Robot

Robot uses two types of files: 1) .robot and 2) Library. The robot file is a simple definition of what scenarios are being tested and what the test data is. The Library file works like glue - taking the inputs from the Robot file and passing them along to your system operations, and calling assertions to check if the tests pass.

We already have a simple Robot file and Library file in our project (two examples actually!). We COULD add more scenarios to it. But, let's create a separate set of files for move, since it's a distinct system operation.

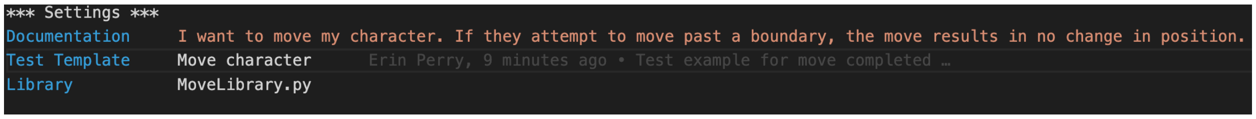
Robot File

Navigate to tests/robot and create a new file named "move.robot"



```
tests
  robot
    __pycache__
    data_driven.robot
    GameControllerLi
    gherkin.robot
    move.robot
```

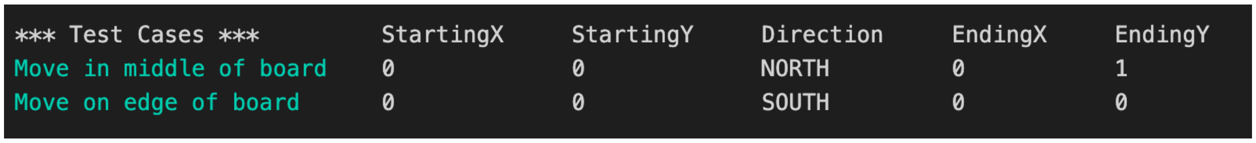
Open the file so we can add some content! Let's start with a description of the Feature. Add the following text. Feel free to customize your description.



```
*** Settings ***
Documentation     I want to move my character. If they attempt to move past a boundary, the move results in no change in position.
Test Template     Move character      Erin Perry, 9 minutes ago • Test example for move completed …
Library           MoveLibrary.py
```

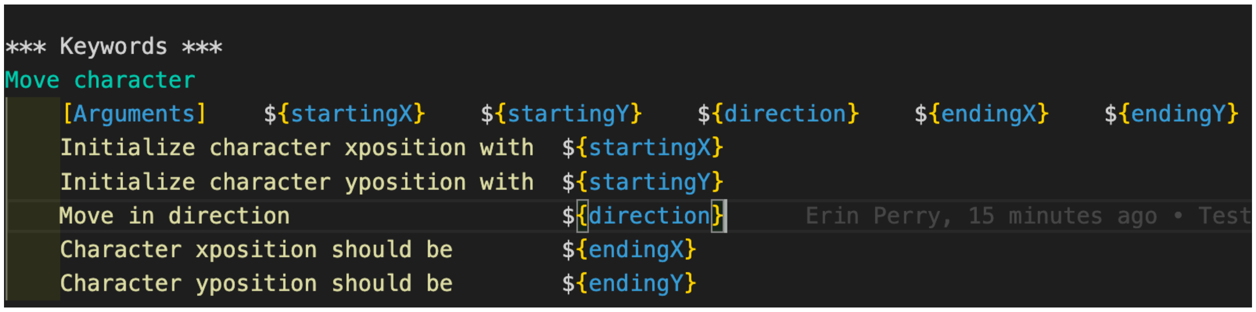
Now let's add our tests data, using what we learned in Specification by Example (SbE). We'll express the Spec by Example table columns. Then, we'll add the examples to the table. Each row can have a descriptive name that helps express what scenario that line is testing.

Add the table. Be sure to use appropriate white space. Note, you may need to adjust or simplify your SbE to transform it into tests. For instance, I made the decision below to separate the X and Y coordinates into separate columns rather than express them as (x,y).



```
*** Test Cases ***         StartingX     StartingY     Direction     EndingX     EndingY
Move in middle of board    0             0             NORTH         0           1
Move on edge of board      0             0             SOUTH         0           0
```

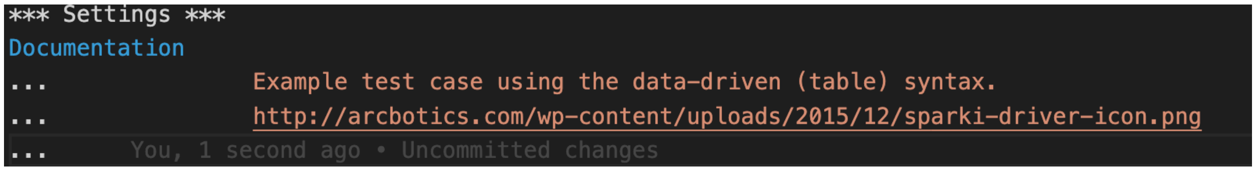
Now, create a Keywords section that will define the method signatures for each column in the table. The keywords here should match the column names in your test data, but starting with lower case letters. For each column, define what the method should be called use it. For pre-conditions, call the method something like “initialize with…” or “set…”. For system operations, call them what the system operation is (like move in direction). For post-conditions, name them “…should be”.



```
*** Keywords ***
Move character
    [Arguments]    ${startingX}    ${startingY}    ${direction}    ${endingX}    ${endingY}
    Initialize character xposition with    ${startingX}
    Initialize character yposition with    ${startingY}
    Move in direction                      ${direction}       Erin Perry, 15 minutes ago • Test
    Character xposition should be          ${endingX}
    Character yposition should be          ${endingY}
```

That’s all we need for our robot file! To reach your Definition of Done, you’ll want to go back later and add images and context so this becomes living documentation. To add images, you can adjust the Documentation section to include a URL to an image file.

For EXAMPLE:



```
*** Settings ***
Documentation
...                 Example test case using the data-driven (table) syntax.
...                 http://arcbotics.com/wp-content/uploads/2015/12/sparki-driver-icon.png
...        You, 1 second ago • Uncommitted changes
```

Will show the image at the URL above in python-robot-reference/test_results/robot/log.html for the test suite.

Library File

The robot file is in human readable syntax and lets you express your test cases. The Library File is there to glue those test cases to your code. We’ll be coding the library file in the language we’re using for our application, in this case Python.

Create a new file in tests/robot/MoveLibrary.py

We'll need 2 imports and 2 attributes to help us store data and call system operations in the GameController class. Inside the MoveLibrary, add the following:

```
from levelup.controller import GameController
from levelup.controller import Direction
```

```
start_x: int
start_y: int
```

Preconditions

Let's start with our preconditions. The names of these methods should match exactly the keywords you defined in the robot file.

Add the following code directly after the attributes above.

```
class MoveLibrary:
    def initialize_character_xposition_with(self, x_position):
        self.start_x = x_position

    def initialize_character_yposition_with(self, y_position):
        self.start_y = y_position

```

That's easy enough. The method names maps directly to the keywords in the robot file. We've accepted a parameter input, which will receive the data from the table in the robot file. In this case, we'll take in integers for the X and Y coordinates. Inside the methods, we're storing the inputs so we can use them in a moment.

System Operation

Time to add our system operation call

```
def move_in_direction(self, direction):
        self.controller = GameController()
        self.controller.set_character_position((self.start_x, 
self.start_y))

        self.controller.move(Direction[direction])
```

This method is in charge of calling our system operation. It first initializes our domain controller, then calls a method called "setCharacterPosition". This method isn't a system operation, but it IS a new method we're going to add to allow us to make the GameController testable. With this method, we can now set state, providing a position for the player to start on before a move. Then, we call the move system operation, get the updated game status, and parse out a position from that games status. If you've just added this code, it won't compile. We need to add the setCharacterPosition method and the currentPosition to the gameStatus class. Let's do that now!

Updating GameController so we can compile

Open the GameController at src/levelup/controller.py

First, add a new attribute to the GameStatus data class. This will allow us to return the player's current position at any point in the game. For simplicity, I'm using a Tuple. You may decide to use another data structure. In this case, I also added a constant to be an arbitrary tuple to initialize it to an invalid value…in this case (-1,-1).

```
@dataclass
class GameStatus:
    running: bool = False
    player: Player = Player(DEFAULT_PLAYER_NAME)
    current_position: tuple = ARBITRARY_INVALID_INITIALIZED_POSITION
```

Now, let's add the setCharacterPosition method:

```
def set_character_position(self, xycoordinates: tuple) -> None:
    print(f"Set character position state for testing")
    # TODO: IMPLEMENT THIS
```

Wait…why is this just an empty method? Why can't we just add the implementation now? Well…because we're doing the OUTER loop of ATDD right now. We're doing just enough to get the test cases setup and compiling. THEN (later in the course), we'll start implementing methods using Unit Test Driven Development. So, create the empty method, which is just enough to get the code to compile, and leave a TODO to implement later. Head back to your MoveLibrary.py class and see if you've resolved the compilation errors.

Post-Conditions

What good is a test without some assertions? The post-conditions are where we put the actual tests for our scenarios. Add the two methods, as shown below.

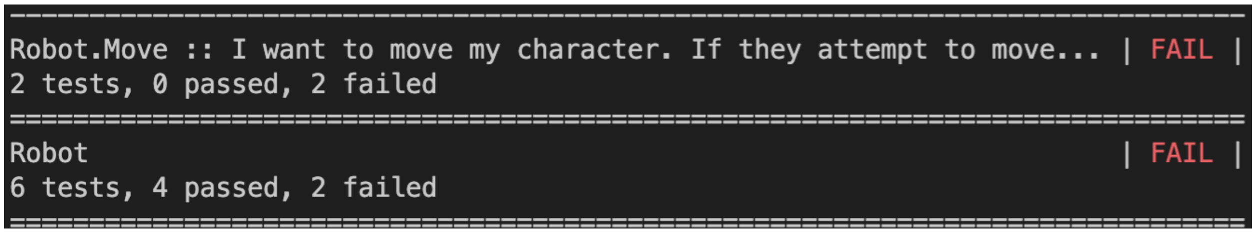
```
    def character_xposition_should_be(self, expected):
        end_x = self.controller.status.current_position[0]
        if end_x != expected:
            raise AssertionError(
                        "%s != %s" % (end_x, expected)
                    )
```

```
    def character_yposition_should_be(self, expected):
        end_y = self.controller.status.current_position[0]
        if end_y != expected:
            raise AssertionError(
                "%s != %s" % (end_y, expected)
            )
```

Yay! Failing Tests!

Make sure everything is saved, then rerun `make test-acceptance`

You should see a BUILD FAILED. That’s good! We want failing tests, but ones that are wired correctly. If things are working, you should see your new tests facing.



```
------------------------------------------------------------------------------
Robot.Move :: I want to move my character. If they attempt to move... | FAIL |
2 tests, 0 passed, 2 failed
==============================================================================
Robot                                                                 | FAIL |
6 tests, 4 passed, 2 failed
==============================================================================
```

Now it’s time to finish up by adding all your test cases to this scenario, as well as create new tests and scenarios for any other acceptance tests you need to add. Don’t forget to add images, write-ups, etc to make this fantastic documentation too!