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# **Stere Documentation**

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**Joshua Fehler**

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## 1.1 Getting Started

### 1.1.1 Requirements

Python  $\geq$  3.6

### 1.1.2 Installation

Stere can be installed with pip using the following command:

```
pip install stere
```

### 1.1.3 Setup

#### **Stere.browser**

Stere requires a browser (aka driver) to work with. This can be any class that ultimately drives automation. Pages, Fields, and Areas inherit their functionality from this object.

Here's an example with Splinter:

```
from stere import Stere
from splinter import Browser

Stere.browser = Browser()
```

As long as the base Stere object has the browser set, the browser's functionality is passed down to everything else.

## **Stere.url\_navigator**

Optionally, an attribute called *url\_navigator* can be provided a string that maps to the method in the browser that opens a page.

In Splinter's case, this is the *visit* method.

```
from stere import Stere
from splinter import Browser

Stere.browser = Browser()
Stere.url_navigator = 'visit'
```

This attribute is used by the *Page* class to make url navigation easier.

## **1.2 Pages**

### **class stere.Page**

Represents a single Web Page. The Page class is the base which all Page Objects should inherit from.

Inheriting from Page is not required for Fields or Areas to work.

All attribute calls are tried on the browser attribute. This allows classes inheriting from Page to act as a proxy to whichever browser/driver is being used.

Using Splinter's browser.url method as an example, the following methods are analogous:

```
>>> MyPage.url == MyPage.browser.url == browser.url
```

The choice of which syntax to use depends on how you want to write your tests.

### **navigate()**

When the base Stere object has been given the *url\_navigator* attribute, and a Page Object has a *page\_url* attribute, the *navigate()* method can be called.

This method will call the method defined in *url\_navigator*, with 'page\_url' as the first parameter.

In the following example, Stere is initialized with Splinter.

```
>>> from splinter import Browser
>>> from stere import Page
>>>
>>> class Home(Page):
>>>     def __init__(self):
>>>         self.page_url = 'https://en.wikipedia.org/'
>>>
>>> Stere.browser = Browser()
>>> Stere.url_navigator = 'visit'
>>>
>>> home_page = Home()
>>> home_page.navigate()
```

### **1.2.1 Using Page as a Context Manager**

Page contains *\_\_enter\_\_()* and *\_\_exit\_\_()* methods. This allows any page to be used as a Context Manager.

Example:

```
from pages import Home

with Home() as p:
    p.login_button.click()
```

## 1.3 Fields

### `class stere.fields.Field`

Field objects represent individual pieces on a web page. Conceptually, they're modelled after general behaviours, not specific HTML elements.

#### Parameters

- **strategy** (*str*) – The type of strategy to use when locating an element.
- **locator** (*str*) – The locator for the strategy.
- **workflows** (*list*) – Any workflows the Field should be included with.

Example:

```
>>> from stere.fields import Field
>>> my_field = Field('xpath', '//*[@id="js-link-box-pt"]/small/span')
```

#### `includes()`

Will search every element found by the Field for a value property that matches the given value. If an element with a matching value is found, it's then returned.

Useful for when you have non-unique elements and know a value is in one of the elements, but don't know which one.

**Parameters** **value** (*str*) – A text string inside an element you want to find.

**Returns** element

Example:

```
>>> class PetStore(Page):
>>>     def __init__(self):
>>>         self.inventory_list = Link('xpath', '//div')
>>>
>>> pet_store = PetStore()
>>> pet_store.inventory_list.includes("Kittens").click()
```

#### `before()`

Called automatically before methods with the `@use_before` decorator are called.

By default it does nothing. Override this method if an action must be taken before the method has been called.

In this example, Dropdown has been subclassed to hover over the Dropdown before clicking.

```
from stere.fields import Dropdown

class CSSDDropdown(Dropdown):
    """A Dropdown that's customized to hover over the element before attempting
    a select.
```

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```
"""
def before(self):
    self.element.mouse_over()
```

**after()**

Called automatically before methods with the `@use_after` decorator are called.

By default it does nothing. Override this method if an action must be taken after the method has been called.

### 1.3.1 Performer method

A Field can have a single method be designated as a performer. This causes the method to be called when the Field is inside an Area and that Area's `perform()` method is called.

For example, Input's performer is the `fill()` method, and Button's performer is the `click()` method. Given the following:

```
self.search = Area(
    query=Input('id', 'xsearch'),
    submit=Button('id', 'xsubmit'),
)
```

When `search.perform()` is called, `query.fill()` is called, followed by `submit.click()`.

See the documentation for [Area](#) for more details.

### Assigning the performer method

When creating a new type of Field, the `stere_performer` class decorator can be used to assign a performer method.

```
from stere.fields.field import stere_performer

@stere_performer('philosophize', consumes_arg=False)
class DiogenesButton(Field):
    def philosophize(self):
        print("As a matter of self-preservation, a man needs good friends or ardent_
↳ enemies, for the former instruct him and the latter take him to task.")
```

The `consumes_arg` argument should be used to specify if the method should use an argument provided by `Area.perform()` or not.

### 1.3.2 Subclassing Field

Field can be subclassed to suit your own requirements.

If the `__init__()` method is overwritten, make sure to call `super()` before your own code.

If your class needs specific behaviour when interacting with Areas, it must implement the `perform()` method.

### 1.3.3 Splinter Fields

Fields that rely on Splinter being connected to Stere.

The following Fields are available with the default Splinter implementation:



- *Button*: Clickable object.
- *Checkbox*: Object with a set and unset state.
- *Dropdown*: Object with multiple options to choose from.
- *Input*: Object that accepts keyboard input.
- *Link*: Clickable text.
- *Root*: Parent container.
- *Text*: Non-interactive text.

#### **class** stere.fields.Button

Convenience Class on top of Field, it implements *click()* as its performer.

Button.**click**()  
Uses Splinter's click method.

#### **class** stere.fields.Checkbox

By default, the Checkbox field works against HTML inputs with type="checkbox".

Can be initialized with the *default\_checked* argument. If True, the Field assumes the checkbox's default state is checked.

It implements *opposite()* as its performer.

Checkbox.**set\_to**()  
Set a checkbox to the desired state.

**Parameters** *state* (*bool*) – True for check, False for uncheck

Checkbox.**toggle**()  
If the checkbox is checked, uncheck it. If the checkbox is unchecked, check it.

Checkbox.**opposite**()  
Switches the checkbox to the opposite of its default state. Uses the *default\_checked* attribute to decide this.

#### **class** stere.fields.Dropdown

By default, the Dropdown field works against HTML Dropdowns. However, it's possible to extend Dropdown to work with whatever implementation of a CSS Dropdown you need.

It implements *select()* as its performer.

The *option* argument can be provided to override the default implementation. This argument expects a Field. The Field should be the individual options in the dropdown you wish to target.

```
self.languages = Dropdown('id', 'langDrop', option=Button('xpath', '/h4/a/strong
↪'))
```

Dropdown.**options**()  
Searches for all the elements that are an option in the dropdown.

**Returns** list

Dropdown.**select**()  
Searches for an option by its html content, then clicks the one that matches.

**Parameters** *value* (*str*) – The option value to select.

**Raises** *ValueError* – The provided value could not be found in the dropdown.

#### **class** stere.fields.Input

A simple wrapper over Field, it implements *fill()* as its performer.

```
Input.fill()
```

Fills the element with value.

```
class stere.fields.Link
```

A simple wrapper over Field, it implements *click()* as its performer.

```
Link.click()
```

Clicks the element.

```
class stere.fields.Root
```

A simple wrapper over Field, it does not implement a performer method.

```
class stere.fields.Text
```

A simple wrapper over Field, it does not implement a performer method.

## 1.4 Location Strategies

These represent the way a locator will be searched for.

By default, the strategies available are:

- css
- xpath
- tag
- name
- text
- id
- value

These all use Splinter. If you're using a different automation tool, you must create your strategies. These can override the default strategies. (ie: You can create a custom css strategy to replace the default)

## 1.5 Custom Locator Strategies

Custom strategies can be defined using the `@strategy` decorator on top of a Class.

Any class can be decorated with `@strategy`, as long as the `_find_all` and `_find_all_in_parent` methods are implemented.

In the following example, the 'data-test-id' strategy is defined. It wraps Splinter's `find_by_xpath` method to simplify the locator required on the Page Object.

```
from stere.strategy import strategy

@strategy('data-test-id')
class FindByDataTestId():
    def is_present(self, *args, **kwargs):
        return self.browser.is_element_present_by_xpath(f'//*[@data-test-id="{self.
↪locator}"]')

    def is_not_present(self, *args, **kwargs):
```

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```

        return self.browser.is_element_not_present_by_xpath(f'//*[@data-test-id="{self.locator}"]')

    def _find_all(self):
        """Find from page root."""
        return self.browser.find_by_xpath(f'//*[@data-test-id="{self.locator}"]')

    def _find_all_in_parent(self):
        """Find from inside parent element."""
        return self.parent_locator.find_by_xpath(f'//*[@data-test-id="{self.locator}"]')

```

With this implemented, Fields can now be defined like so:

```
my_button = Button('data-test-id', 'MyButton')
```

## 1.6 Areas

Areas represent groupings of Fields on a Page.

The following Area objects are available:

- Area: A non-hierarchical, unique group of Fields.
- RepeatingArea: A hierarchical, non-unique group of Areas. They require a Root Field.

**class** stere.areas.Area

A collection of unique fields.

The Area object takes any number of Fields as arguments. Each Field must be unique on the Page and only present in one Area.

Example:

```

>>> from stere.areas import Area
>>> from stere.fields import Button
>>>
>>> class Album(Page):
>>>     def __init__(self):
>>>         self.tracks = Area(
>>>             first_track=Button('xpath', '//my_xpath_string'),
>>>             second_track=Button('xpath', '//my_xpath_string'),
>>>             third_track=Button('xpath', '//my_xpath_string'),
>>>         )
>>>
>>> def test_stuff():
>>>     album = Album()
>>>     album.tracks.third_track.click()

```

**perform()**

For every Field in an Area, sequentially “do the right thing” by calling the Field’s perform() method.

Every Field that implements perform() must return True or False. If True, assume the argument has been used. If False, assume the argument is still available.

**Parameters** *args* – Array that should be equal to the number of Fields in the Area that take an argument.

### Example

```
>>> from stere.areas import Area
>>> from stere.fields import Button, Input
>>>
>>> class Login():
>>>     def __init__(self):
>>>         self.form = Area(
>>>             username=Input('xpath', '//my_xpath_string'),
>>>             password=Input('xpath', '//my_xpath_string'),
>>>             submit=Button('xpath', '//my_xpath_string')
>>>         )
>>>
>>>
>>> def test_login():
>>>     login = Login()
>>>     login.my_area.perform('Sven', 'Hoek')
```

### **class** stere.areas.RepeatingArea

Represents a collection of Fields that appear multiple times on a Page.

The RepeatingArea objects requires a Root Field in the arguments, but otherwise takes any number of Fields as arguments. The other Fields will use the Root as a parent.

Example:

```
>>> from stere.areas import RepeatingArea
>>> from stere.fields import Root, Input
>>>
>>> class MyPage():
>>>     def __init__(self):
>>>         self.my_repeating_area = RepeatingArea(
>>>             root=Root('xpath', '//my_xpath_string'),
>>>             my_input=Input('xpath', '//my_xpath_string')
>>>         )
```

### **areas** ()

Find all instances of the root, then return an array of Areas for each root.

**Returns** Collection of every Area that was found.

**Return type** list

**Raises** ValueError – If no Areas were found.

Example:

```
>>> def test_stuff():
>>>     listings = MyPage().my_repeating_area.areas
>>>     listings[0].my_input.fill('Hello world')
```

### **area\_with** ()

Searches the RepeatingArea for a single Area where the Field's value matches the expected value and then returns the entire Area object.

#### Parameters

- **field\_name** (*str*) – The name of the field object.
- **field\_value** (*str*) – The value of the field object.

Returns Area

### Example

```
>>> class Inventory():
>>>     def __init__(self):
>>>         self.items = RepeatingArea(
>>>             root=Root('xpath', '//my_xpath_string'),
>>>             description=Text('xpath', '//my_xpath_string')
>>>         )
>>>
>>> def test_stuff():
>>>     inventory = Inventory()
>>>     found_area = inventory.items.area_with(
>>>         "description", "Bananas")
```

## 1.6.1 Reusing Areas

Sometimes an identical Area may be present on multiple pages. Areas do not need to be created inside a page object, they can be created outside and then called from inside a page.

```
header = Area(
    ...
)

class Items(Page):
    def __init__(self, *args, **kwargs):
        self.header = header
```

## 1.6.2 Subclassing Areas

If an Area appears on many pages and requires many custom methods, it may be better to subclass the Area instead of embedding the methods in the Page Object:

```
class Header(Area):
    def __init__(self, *args, **kwargs):
        super().__init__(*args, **kwargs)

    def my_custom_method(self, *args, **kwargs):
        ...

class Main(Page):
    def __init__(self, *args, **kwargs):
        self.header = Header()

class Other(Page):
    def __init__(self, *args, **kwargs):
        self.header = Header()
```

## 1.7 Workflows

When working with an Area that has multiple possible routes, there may be Fields which you do not want the `.perform()` method to call under certain circumstances.

Take the following example Page Object:

```
class AddSomething(Page):
    def __init__(self):
        self.form = Area(
            item_name=Input('id', 'itemName'),
            item_quantity=Input('id', 'itemQty'),
            save=Button('id', 'saveButton'),
            cancel=Button('id', 'cancelButton')
        )
```

Calling `AddSomething().form.perform()` would cause the save button and then the cancel button to be acted on.

In these sorts of cases, Workflows can be used to manage which Fields are called.

```
class AddSomething(Page):
    def __init__(self):
        self.form = Area(
            item_name=Input('id', 'itemName', workflows=["success", "failure"]),
            item_quantity=Input('id', 'itemQty', workflows=["success", "failure"]),
            save=Button('id', 'saveButton', workflows=["success"]),
            cancel=Button('id', 'cancelButton', workflows=["failure"])
        )
```

Calling `AddSomething().form.workflow("success").perform()` will ensure that only Fields with a matching workflow are called.

## 1.8 Best Practices

A highly opinionated guide. Ignore at your own peril.

### 1.8.1 Favour composition over inheritance

When building Page Objects for something with many reused pieces (such as a settings menu) don't build an abstract base Page Object. Build each component separately and call them in Page Objects that reflect the application.

**Inheritance:**

```
class BaseSettings(Page):
    def __init__(self):
        self.menu = Area(...)

class SpecificSettings(BaseSettings):
    def __init__(self):
        super().__init__()
```

**Composition:**

```
from .another_module import settings_menu

class SpecificSettings(Page):
    def __init__(self):
        self.menu = settings_menu
```

**Explanation:**

Doing so maintains the benefits of reusing code, but prevents the creation of Page Objects that don't reflect actual pages in an application.

Creating abstract Page Objects to inherit from can make it confusing as to what Fields are available on a page.

## 1.8.2 Single blank line when changing page object

**Wrong:**

```
def test_the_widgets():
    Knicknacks.menu.gadgets.click()
    Knicknacks.gadgets.click()
    Gadgets.add_widgets.click()

    Gadgets.add_sprocket.click()
```

**Right:**

```
def test_the_widgets():
    Knicknacks.menu.gadgets.click()
    Knicknacks.gadgets.click()

    Gadgets.add_widgets.click()
    Gadgets.add_sprocket.click()
```

**Explanation:**

Changing pages usually indicates a navigation action. Using a consistent line break style visually helps to indicate the steps of a test.





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