Fixtures in Golang

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Fixtures in Golang

- Simple tests in Golang
- Test in python with Pytest (fixture example)
- Features of fixtures
- Same test with fixtures in Go
- Fixtures examples
- Questions

Golang tests

Golang tests

Simple create directory

Golang tests

Simple create directory

```go
func TestCreateDir_Go(t *testing.T) {
	dir, err := os.MkdirTemp("", "")
	if err != nil {
		t.Fatalf("failed to create temp dir: %v", err)
	}
	defer func() {
		_ = os.RemoveAll(dir)
	}()

	fpath := filepath.Join(dir, "tmp")
	err = os.Mkdir(fpath, 0666)
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Golang tests

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Golang tests

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  }
  defer func() {
    _ = os.RemoveAll(dir)
  }()

  fpath := filepath.Join(dir, "tmp")
  f, err := os.Create(fpath)
  if err != nil {
    t.Fatalf("failed to create file: %v", err)
  }

  _ = f.Close()
}
```

Golang tests

Simple create file

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   fpath := filepath.Join(dir, "tmp")
   f, err := os.Create(fpath)
   if err != nil {
      t.Fatalf("failed to create file: %v", err)
   }

   _ = f.Close()
}
```

Golang tests

Common environment

```go
func TestXXX_Go(t *testing.T) {
    dir, err := os.MkdirTemp("", "")
    if err != nil {
        t.Fatalf("failed to create temp dir: %v", err)
    }
    defer func() {
        _ = os.RemoveAll(dir)
    }()

    ...
}
```

Python with fixtures

Pytest tests

Pytest tests

```
def test_create_dir(folder):
    path = os.path.join(folder, "tmp")
    os.mkdir(path)
```

Pytest tests

```
def test_create_dir(folder):
    path = os.path.join(folder, "tmp")
    os.mkdir(path)

def test_create_file(folder):
    path = os.path.join(folder, "tmp")
    f = open(path, "wb")
    f.close()
```

Pytest tests

```
def test_create_dir(folder):
    path = os.path.join(folder, "tmp")
    os.mkdir(path)
```

```
def test_create_file(folder):
    path = os.path.join(folder, "tmp")
    f = open(path, "wb")
    f.close()
```

```
@pytest.fixture()
def folder():
    dir = tempfile.mkdtemp()
    yield dir
    shutil.rmtree(dir)
```

Fixtures

- Provides defined, reliable and consistent context for the tests
- Can depends from other fixtures
- Easy cleanup

Golang with fixtures

Fixtures in Golang fixenv

create dir, show fixture

Fixtures in Golang fixenv

create dir, show fixture

```
func TestCreateDir_Fixenv(t *testing.T) {
   e := fixenv.New(t)
   fpath := filepath.Join(Folder(e), "dir")
   err := os.Mkdir(fpath, 0666)
   if err != nil {
      t.Fatalf("failed to create file: %v", err)
   }
}
```

Fixtures in Golang fixenv

create dir, show fixture, service code

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func TestCreateDir_Fixenv(t *testing.T) {
   e := fixenv.New(t)
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Fixtures in Golang fixenv

create dir, test code

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  }
}

func TestCreateFile_Fixenv(t *testing.T) {
  e := fixenv.New(t)
  fpath := filepath.Join(Folder(e), "file")
  f, err := os.Create(fpath)
  if err != nil {
    t.Fatalf("failed to create file: %v", err)
  }
  _ = f.Close()
}
```

Fixtures in Golang fixenv

Compare tests

```go
func TestCreateDir_Go(t *testing.T) {
    dir, err := os.MkdirTemp("", "")
    if err != nil {
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    }
    defer func() {
        _ = os.RemoveAll(dir)
    }()

    fpath := filepath.Join(dir, "tmp")
    err = os.Mkdir(fpath, 0666)
    if err != nil {
        t.Fatalf("failed to create dir: %v", err)
    }
}
```

```go
func TestCreateDir_Fixenv(t *testing.T) {
    e := fixenv.New(t)
    fpath := filepath.Join(Folder(e), "dir")
    err := os.Mkdir(fpath, 0666)
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}
```

Fixtures in Golang fixenv

Compare tests, service code

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Fixtures examples

Fixtures examples, Golang fixenv

defined, reliable and consistent context

- Fixture always return same value for the test

Fixtures examples, Golang fixenv

defined, reliable and consistent context

- Fixture always return same value for the test

```
func TestConsistentContext(t *testing.T) {
   e := fixenv.New(t)
   t.Log("first", Folder(e))
   t.Log("second", Folder(e)) // Same as first time
   t.Log("test finish")
}
```

Fixtures examples, Golang fixenv

defined, reliable and consistent context

- Fixture always return same value for the test

```
func TestConsistentContext(t *testing.T) {
   e := fixenv.New(t)
   t.Log("first", Folder(e))
   t.Log("second", Folder(e)) // Same as first time
   t.Log("test finish")
}

// Output:
Directory created: /tmp/123
first /tmp/123
second /tmp/123
test finish
Directory removed: /tmp/123
```

Fixtures examples, Golang fixenv

Can depends from other fixtures

Fixtures examples, Golang fixenv

Can depends from other fixtures

```
func Inbox(e fixenv.Env) string {
   return fixenv.Cache(e, nil, nil, func() (string, error) {
      path := filepath.Join(Folder(e), "inbox")
      e.T().Logf("Creating inbox directory: %v", path)
      return path, os.Mkdir(path, 0666)
   })
}
```

Fixtures examples, Golang fixenv

Can depends from other fixtures

```go
func Inbox(e fixenv.Env) string {
  return fixenv.Cache(e, nil, nil, func() (string, error) {
    path := filepath.Join(Folder(e), "inbox")
    e.T().Logf("Creating inbox directory: %v", path)
    return path, os.Mkdir(path, 0666)
  })
}

func TestInbox(t *testing.T) {
  e := fixenv.New(t)
  t.Log(Inbox(e))
  t.Log(Folder(e))
  t.Log(Folder(e))
}
```

Fixtures examples, Golang fixenv

Can depends from other fixtures

```
func Inbox(e fixenv.Env) string {
   return fixenv.Cache(e, nil, nil, func() (string, error) {
      path := filepath.Join(Folder(e), "inbox")
      e.T().Logf("Creating inbox directory: %v", path)
      return path, os.Mkdir(path, 0666)
   })
}
```

```
func TestInbox(t *testing.T) {
   e := fixenv.New(t)
   t.Log(Inbox(e))
   t.Log(Folder(e))
   t.Log(Folder(e))
}
```

```
// Output:
Directory created: /tmp/123
Creating inbox directory: /tmp/123/inbox
inbox /tmp/123/inbox
first /tmp/123
second /tmp/123
Directory removed: /tmp/123
```

Fixtures examples, Golang fixenv

Easy cleanup, included in fixture

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type FixtureCleanupFunc func()
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Fixtures examples, Golang fixenv

Easy cleanup, included in fixture

```
type FixtureCleanupFunc func()

func CacheWithCleanup[TRes any](env Env, cacheKey any, opt *FixtureOptions,
f func() (TRes, FixtureCleanupFunc, error)) TRes {
```

Fixtures examples, Golang fixenv

Easy cleanup, included in fixture

```go
type FixtureCleanupFunc func()

func CacheWithCleanup[TRes any](env Env, cacheKey any, opt *FixtureOptions,
f func() (TRes, FixtureCleanupFunc, error)) TRes {


func Folder(e fixenv.Env) string {
    return fixenv.CacheWithCleanup(e, nil, nil, func() (
        string, // result value
        fixenv.FixtureCleanupFunc, // cleanup func
        error, // error, test will fail if error non nil
    ) {
        dir, err := os.MkdirTemp("", "")
        if err != nil {
            return "", nil, err
        }
        e.T().Logf("Directory created: %v", dir)
        clean := func() {
            _ = os.RemoveAll(dir)
            e.T().Logf("Directory removed: %v", dir)
        }
        return dir, clean, nil
    })
}
```

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Advanced features:

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- Easy create test environment: call fixture for get value
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Advanced features:

- Use fixtures with params (for create and few similar dependencies)
-

Fixtures in Golang fixenv

- Easy create test environment: call fixture for get value
- Easy cleanup, independent of fixtures count: cleanup code included in fixture
- Easy for reuse: fixture is function, you can use standard fixtures or create own fixtures library

Advanced features:

- Use fixtures with params (for create and few similar dependencies)
- Reuse heavy dependencies between test and subtest

Fixtures in golang test

https://github.com/rekby/fixenv

The project (slides and examples):
https://github.com/rekby/evrone-2023

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