P-06: Reflection and Threads in various languages

CSCI - P436 | *Brandon Yonug*

Languages

- Ruby
- Python
- Java

Ruby Code

```ruby
newTest = Thread.new{ }
puts newTest.class.instance_methods(true)
```

Python Code

```python
import threading
print(dir())
```

Java Code

```java
import java.util.*;
import java.io.*;
import java.lang.reflect.*;

public class ThreadInfo {

    public static void main(String[] args) {

        Reflections obj = new Reflections();
        Class threads = Thread.class;
        Method[] threadMethods = threads.getDeclaredMethods();
        System.out.println("List of all methods from Thread class: ");
        for (Method threadMethod : threadMethods) {
            System.out.println(threadMethod.getName());
        }

    }
}

class Reflections extends Thread {

    Reflections() {
    }
```

```java
    public void testMethod() {
        System.out.println("This is a test method");
    }

}
```

Runing the code

- Ruby Version: `ruby <filename>.rb`
- Python Version: `python <filename>.py`
- Java Version: `javac <filename>.java && java filename`

Ruby Output

pending_interrupt?

raise

join

value

kill

terminate

exit

run

wakeup

[]

[]=

key?

keys

priority

priority=

status

thread_variable_get

thread_variable_set

thread_variables

thread_variable?

alive?

stop?

abort_on_exception

abort_on_exception=

safe_level

group

backtrace

backtrace_locations

inspect

set_trace_func

add_trace_func

nil?

```
===
=~
!~
eql?
hash
<=>
class
singleton_class
clone
dup
taint
tainted?
untaint
untrust
untrusted?
trust
freeze
frozen?
to_s
methods
singleton_methods
protected_methods
private_methods
public_methods
instance_variables
instance_variable_get
instance_variable_set
instance_variable_defined?
remove_instance_variable
instance_of?
kind_of?
is_a?
tap
send
public_send
respond_to?
extend
display
method
public_method
define_singleton_method
object_id
to_enum
enum_for
==
equal?
```

!

!=

instance_eval

instance_exec

__send__

__id__

Python Output

['__annotations__', '__builtins__', '__cached__', '__doc__', '__file__', '__loader__', '__name__', '__package__', '__spec__', 'threading']

Java Output

List of all methods from Thread class:

getName

run

exit

dispatchUncaughtException

toString

clone

isInterrupted

isInterrupted

currentThread

onSpinWait

registerNatives

join

join

join

getThreadGroup

setContextClassLoader

holdsLock

getStackTrace

checkAccess

dumpStack

setPriority

setDaemon

start

sleep

sleep

isCCLOverridden

isDaemon

getPriority

getContextClassLoader

nextThreadID

nextThreadNum

start0

resume

stop0

interrupt0

interrupt

suspend0

resume0

setPriority0

setNativeName

activeCount

enumerate

isAlive

dumpThreads

getThreads

processQueue

auditSubclass

setDefaultUncaughtExceptionHandler

getUncaughtExceptionHandler

blockedOn

yield

stop

interrupted

suspend

setName

countStackFrames

getAllStackTraces

getId

getState

getDefaultUncaughtExceptionHandler

setUncaughtExceptionHandler