

Multi-core programming

Lab 2: Introduction to Erlang

Exercise 1.2: REPL

```
$ erl
```

```
Erlang R15B01 (erts-5.9.1) [source] [64-bit]  
[smp:4:4] [async-threads:0] [kernel-poll:false]
```

```
Eshell V5.9.1 (abort with ^G)
```

```
1> lists:sort([1, 4, 3, 2]).
```

```
[1,2,3,4]
```

Exercise 1.3: Hello World!

```
-module(hello_world).
```

```
-export([start/0]).
```

```
start() ->  
    io:fwrite("Hello World!~n").
```

1. Compile .erl → .beam

```
> make
```

same as:

```
> erlc +debug_info hello_world.erl
```

2. Execute

```
> ./run.sh hello_world start
```

same as:

```
> erl -noshell -s hello_world start -s init stop
```

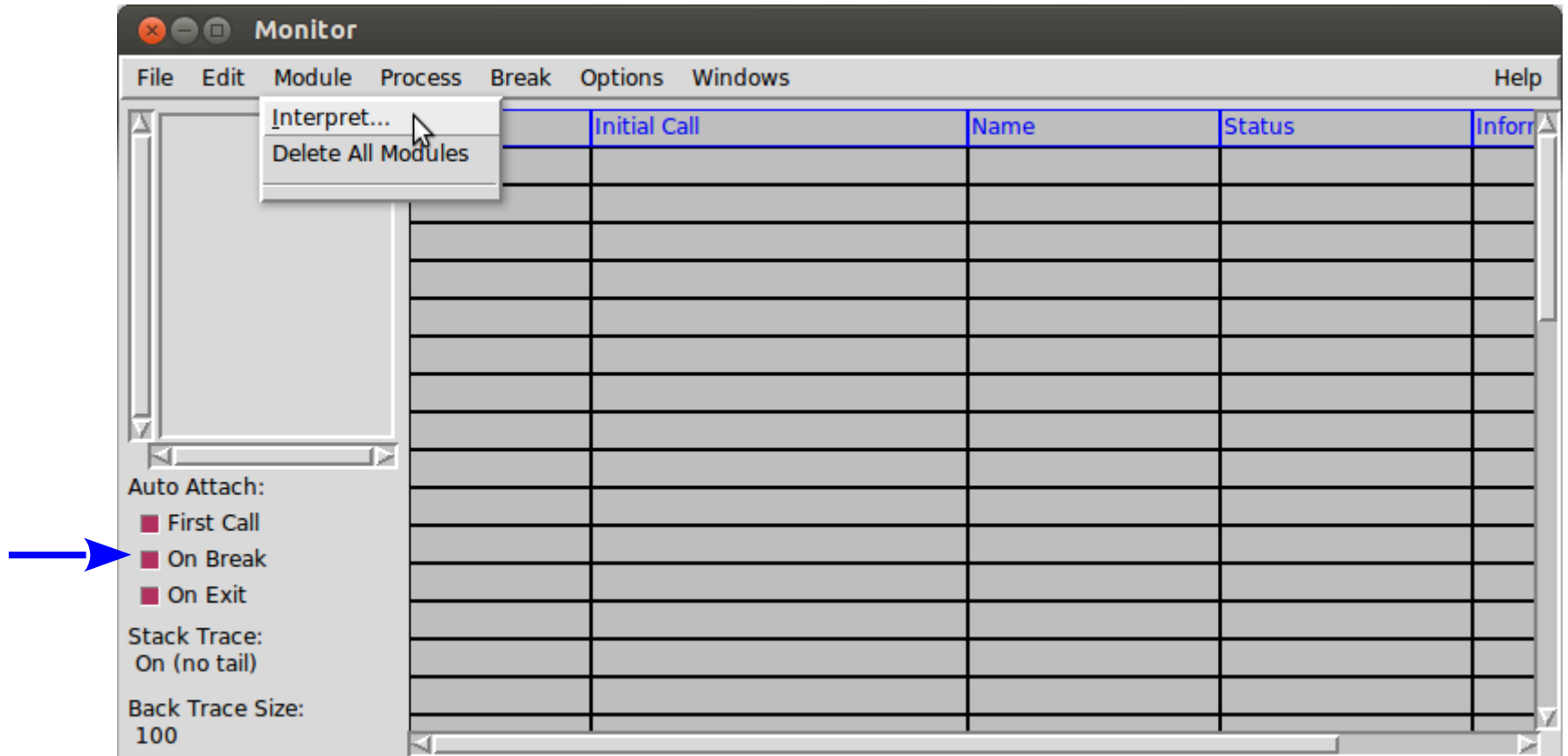
don't show REPL

first execute function start
in module hello_world

then execute stop
in module init

Exercise 1.4: Debugger

```
> debugger:start().
```



Exercise 2.1: Pattern Matching

$\{A, b\} = \{\text{something}, b\}$

$\Rightarrow A = \text{something}$

$[One, Two, Three] = [a, b, c]$

$\Rightarrow One = a$

$Two = b$

$Three = c$

Remember:

CapitalLetter:variable

smallLetter:atom

Exercise 2.2: Lists

1. Implement nth

`nth(3, [1, 2, 3, 4]) → 3`

Use pattern matching and recursion

Trick: `nth(3, [1, 2, 3, 4]) = nth(2, [2, 3, 4])`

2. Find error in `match_list`

What is `ThreeAs`?

Exercise 2.3: Control Structures

1. Fix `case_statement`

2. Fix `if_statement`

What does `>=` do?

General advice for idiomatic Erlang:
case is better than `if`; but
using several function clauses and
pattern matching is even better

```
fib(X) ->  
  if  
    X == 0 -> 0;  
    X == 1 -> 0;  
    true   -> fib(X-1) + fib(X-2)  
  end.
```

Bad!

```
fib(X) ->  
  case X of  
    0    -> 0;  
    1    -> 0;  
    Else -> fib(X-1) + fib(X-2)  
  end.
```

Still bad!

```
fib(0) -> 0;  
fib(1) -> 1;  
fib(X) -> fib(X-1) + fib(X-2).
```

Good!

Exercise 2.4: Records

Add city field to address record.

Exercise 2.5: Code Swapping

1. Compile and run version 3.
2. version 3: swap.erl → swap.v3.erl
 version 5: swap.v5.erl → swap.erl
3. Compile version 5.
4. `reload`: should switch from 3 to 5.