Condition System in R

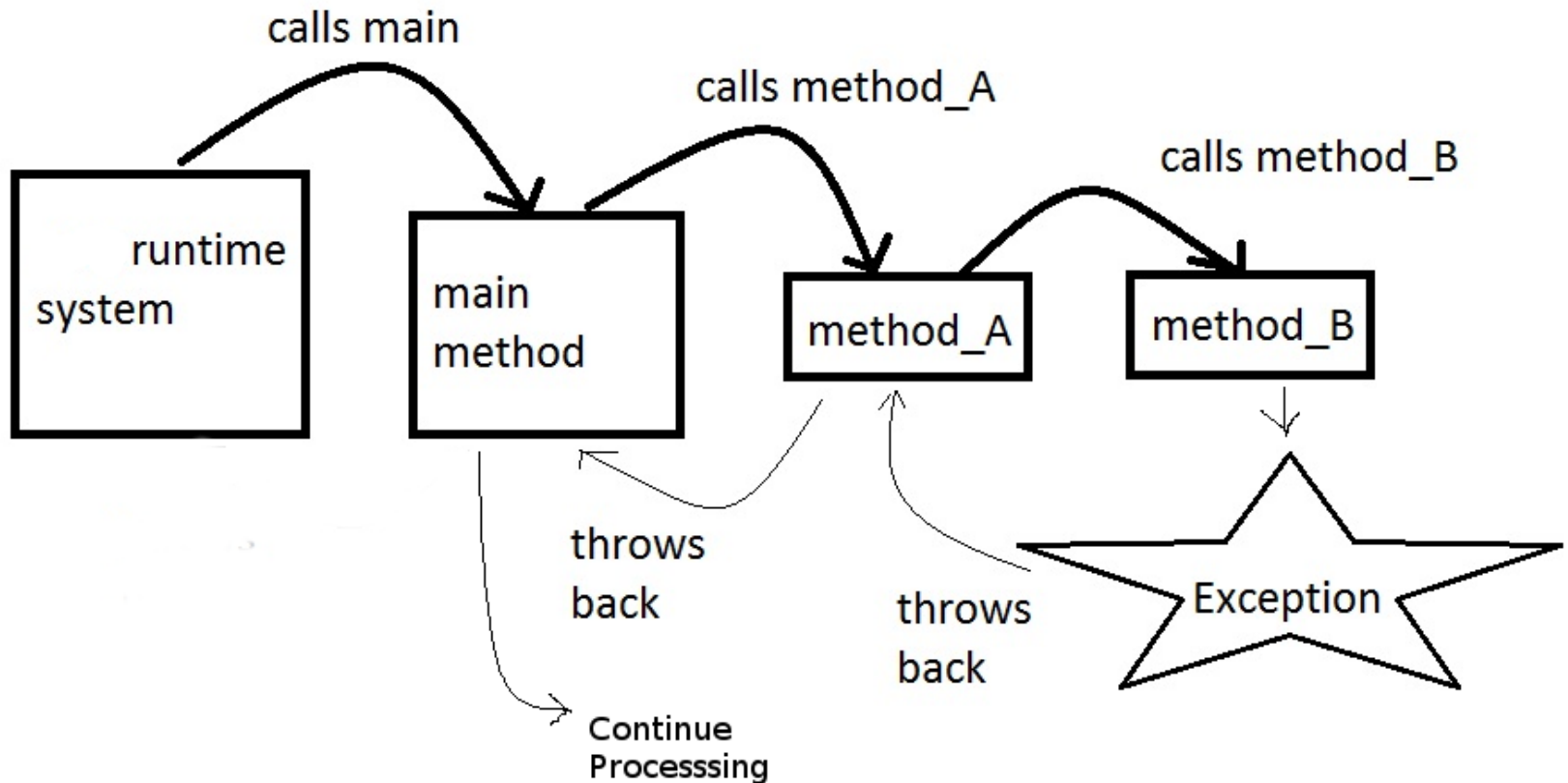## SoCal R Users Groups & R-Ladies All-hands Meeting

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Condition System

- `message()`, `warning()`, `stop()`, `try()` and `tryCatch()` are built on the Condition System
- These are used for error handling
- Condition System can do much more

Sequence of execution

Components

1. Signaller
2. Handler
3. Restarting

Components - Condition Object

- An S3 object
- must have the class `condition`

```
structure(
    class = c(condition_class, "condition"),
    list(message = message, call = call, ...)
  )
```

Components - Signaller

- `signalCondition()` raises a condition object

`signalCondition(skip_entry_condition(text))`

Components - Handler

- `withCallHandlers()` catches the raised condition

```
withCallingHandlers(
  {some code},
  condition_class_1 = handler_function_1,
  condition_class_2 = handler_function_2
)

withCallingHandlers(
  parse_file(file),
  skip_entry = skip_entry_handler,
  keep_entry = keep_entry_handler
)
```

Components - Restart

- `findRestart()` finds a restart label
- `invokeRestart()` transfer control to the restart

```
condition_handler_factory ← function(restart_name)
  function(cond) {
    restart ← findRestart(restart_name)
    if (is.null(restart)) { return() }

    invokeRestart(restart)
  }
}
```

Components - Restart

- `withRestart()` entry point for restart

```
withRestarts(
  {some code},
  restart_name_1 = restart_function_1,
  restart_name_2 = restart_function_2
)

withRestarts(
  choose_entry_test(text, p_skip = 0.5),
  skip_entry = function() NULL,
  keep_entry = function() parse_entry(text)
)
```

Call Stack

```
1 main call:
2   withCallingHandlers(
3     {do something 1},
   8 my_condition = my_handler)9
```

```
3 do something 1:
4 withRestarts(
5   {do something 2},
  12 my_restart = my_function)13
```

```
5 do something 2:
6 {do some work}
7 signalCondition(my_condition)
```

```
 9 my_handler:
10 r <- findRestart('my_restart')
11 invokeRestart(r)
```

Thank You

References

- http://www.gigamonkeys.com/book/beyond-exception-handling-conditions-and-restarts.html
- https://adv-r.hadley.nz/conditions.html
- http://adv-r.had.co.nz/beyond-exception-handling.html
- http://adv-r.had.co.nz/Exceptions-Debugging.html