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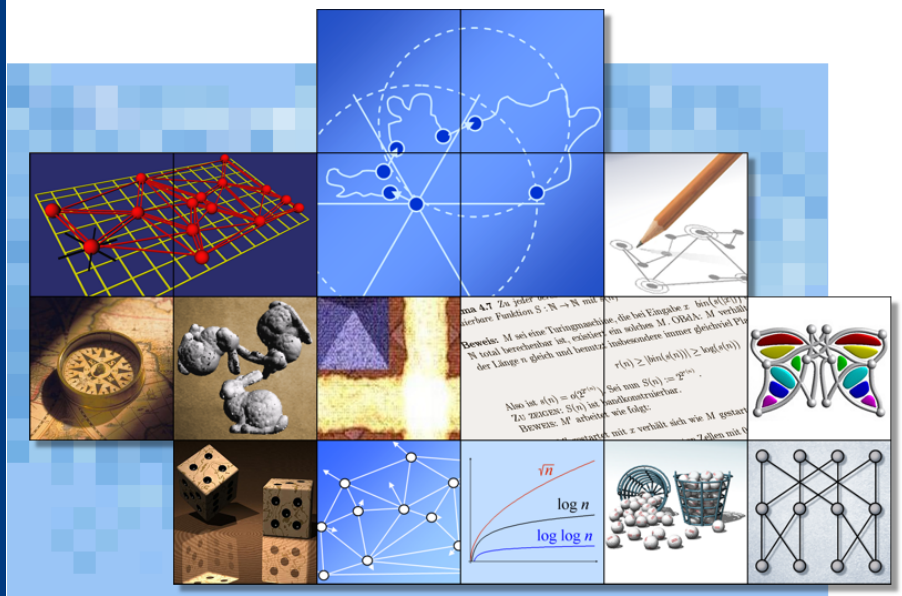
EScript

Short Presentation of a Scripting Language



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Benjamin Eikel

Overview

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What is EScript?

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EScript . . .

- is an object-oriented scripting language.
- is compiled and executed by a virtual machine.
- has a similar syntax to C.
- was developed to use C++ objects from scripts easily.

What is EScript?

EScript . . .

- is released under a free software license.
- is available from `http://escript.berlios.de/`.
- can be built using CMake.
- has a command-line interpreter.
- can be used internally by other C++ projects (e.g. PADrend).

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First Example

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- EScript files should have the extension `.escript`.
- The EScript parser analyzes the script file line by line.
- A simple script:

```
out("Hello, world!\n");
```

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Number

```
1        27.4        0x1a        25 / 5        3 + 4
```

String

```
"an"        'example'        "hello"+ ', ' + "world"
```

Bool

`true` **`false`**

Void

`void`

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No conversion to false

```
outln(false || false); // Output: false
outln(false || 0); // Output: true
outln(false || ""); // Output: true
```

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No conversion to false

```
outln(false || false); // Output: false
outln(false || 0); // Output: true
outln(false || ""); // Output: true
```

Conversion of String to Number

```
outln((60 + "4").sqrt()); // Output: 8
outln((10 * "10").log(10)); // Output: 2
```

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No conversion to false

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outln(false || false); // Output: false
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Conversion of String to Number

```
outln((60 + "4").sqrt()); // Output: 8
outln((10 * "10").log(10)); // Output: 2
```

Conversion of Number to String

```
outln("4" + 60); // Output: 460
outln("12" + 3); // Output: 123
```

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var

```
/*
   Declaring a variable is done using the keyword
   "var", an identifier, an equation sign, and an
   expression on the right side. The type of the
   variable is deduced from the expression on the
   right side.
 */
var xPos = 500 - 80 / 2;

// The variable "message" will be of type String
var message = "Please click the button";

// Dynamically change the type to Number
message = 5;
```

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fn

```
var square = fn(num) {
    return num * num;
};
var a = square(5);
var b = square(4.2);
```

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Array

```
var numbers = [3, 23, 7, 3, 100, 1, 35];
var colors = ["red", "green", "blue"];
```

Map

```
var fruits = {
    "lemon" : "yellow",
    "cherry" : "red"
};
fruits["apple"] = "green";
```

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ExtObject

```
var car = new ExtObject();
car.color := "red";
car.speed := 190;
car.outputDesc := fn() {
    out("This is a ", this.color, " car ");
    out("with top speed ", this.speed, ".\n");
};

...

car.speed = 185;
car.outputDesc();
```

Output: This is a red car with top speed 185.

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Type

```
var Shape = new Type();
Shape.color := "white";

// New type that is derived from Shape
var Polygon = new Type(Shape);
Polygon.numVertices := 3;

// New type that is derived from Shape
var Circle = new Type(Shape);
Circle.radius := 0;

var circle = new Circle();
circle.color = "red";
circle.radius = 5;
```

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if

```
var result = /* some function */;
if(result) {
    out("Success");
} else {
    out("Failure");
}

var num = /* some number */;
if(num < 0) {
    out("Too small");
} else if(num >= 0 && num <= 100) {
    out("Range okay");
} else {
    out("Too large");
}
```

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? (conditional operator)

```
var num = /* some number */;
var positive = (num > 0) ? true : false;
```

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? (conditional operator)

```
var num = /* some number */;
var positive = (num > 0) ? true : false;
```

Note: There is no `switch` in EScript.

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while

```
var tasks = [/* some tasks */];
while(!tasks.empty()) {
    var firstTask = tasks.front();
    tasks.popFront();
    // do something with first task
}
```

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for

```
var sum = 0;
for(var i = 0; i < 100; ++i) {
    sum += i;
}
out("Sum of numbers: ", sum, "\n");
```

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foreach

```
var chars = ["a", "c", "k", "b", "d", "x", "j"];
foreach(chars as var i, var c) {
    if(c == "x") {
        out("Character \"x\" found at index " + i);
        break;
    }
}
```

Output: Character "x" found at index 5

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Call a function on another object.

Example

```
var printOut = fn() {
    out("I am a " + this.color + " node.\n");
};

var nodeRed = new ExtObject();
nodeRed.color := "red";
var nodeBlack = new ExtObject();
nodeBlack.color := "black";

var printOutRed = nodeRed -> printOut;
var printOutBlack = nodeBlack -> printOut;

printOutRed(); // Output: I am a red node.
printOutBlack(); // Output: I am a black node.
```

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Example

```
var Polygon = new Type();
Polygon.vertices @(private, init) := Array;
Polygon.shapeType @(const) := "Polygon";

Polygon.getNumVertices := fn() {
    return this.vertices.count();
};

var polygon = new Polygon();
polygon.getNumVertices();
```

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Factorial: $n! = 1 \cdot 2 \cdot 3 \cdot \ldots \cdot n$ $0! = 1$

Example

```
var factorialRecursive = fn(Number n) {
    return (n == 0) ? 1 : thisFn(n - 1) * n;
};
var factorialIterative = fn(Number n) {
    var product = 1;
    for(var i = 2; i <= n; ++i) {
        product *= i;
    }
    return product;
};

outln(factorialRecursive(6)); // Output: 720
outln(factorialIterative(7)); // Output: 5040
```

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Example

```
var Player = new Type();
Player.x @(private) := 0;
Player.y @(private) := 0;
Player.move ::= fn(Number dx, Number dy) {
    this.x += dx;
    this.y += dy;
};
Player.printPos ::= fn() {
    outln("Position: (", this.x, ", ", this.y, ")");
};

var playerA = new Player();
playerA.move(5, 7);
playerA.printPos(); // Output: Position: (5, 7)
```

Further Documentation

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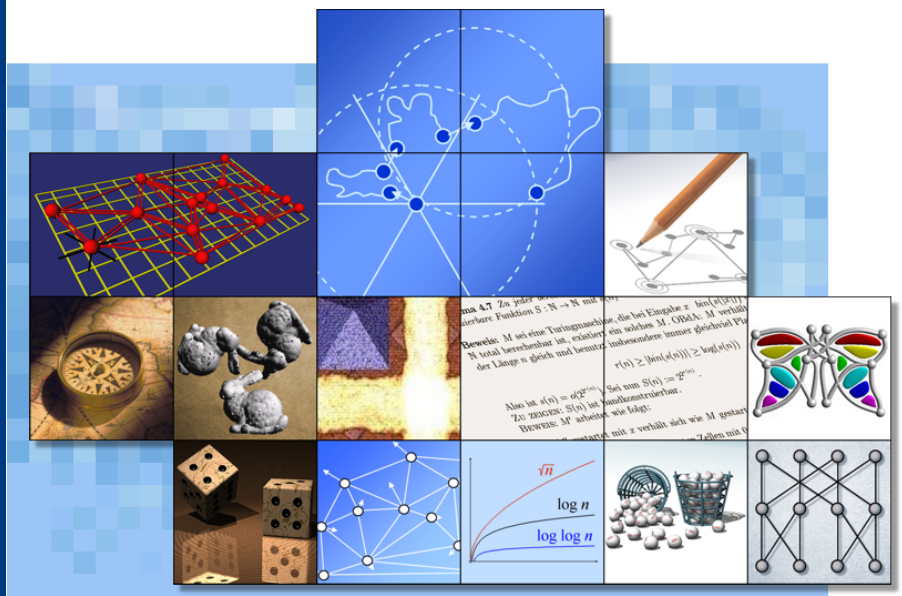
You can find additional documentation in `EScript/docs/Introduction.html`.

Thank you for your attention!



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