

# 情報科学概論 I レポート

学籍番号 200911434

名前 青木大祐

2013 年 7 月 25 日

## マージソートの図示

マージソートの手順は、以下のプログラムによって図示される。

```
use v5.14.0;

my @array = (10, 2, 8, 9, 2, 1, 4, 7, 6, 3);
my @graph = ();
my @graph2 = ();
my $depth = 0;

say join ", ", mergesort(@array);
pop @graph;
pop @graph2;

for (@graph) {
    print for @{$_}; print "\n";
}
for (reverse @graph2) {
    last if !defined $_;
    print for @{$_}; print "\n";
}

sub mergesort {
    my @array = @_;
    $depth++;
    if (defined $graph[$depth]) {
        push @{$graph[$depth]}, "[" . (join ", ", @_) . "]";
    } else {
        $graph[$depth] = ();
        push @{$graph[$depth]}, "[" . (join ", ", @_) . "]";
    }

    my $size = $#array;
    my (@former, @latter);
    my @res;

    if ($size == 0) {
        if (defined $graph2[$depth]) {
            push @{$graph2[$depth]}, "{" . (join ", ", @array) . "}";
        } else {
            $graph2[$depth] = ();
            push @{$graph2[$depth]}, "{" . (join ", ", @array) . "}";
        }
        $depth--;
        return @array;
    } else {
        @former = mergesort(@array[0 .. $size / 2]);
        @latter = mergesort(@array[$size / 2 + 1 .. $size]);
        while (@former && @latter) {
            if ($former[0] <= $latter[0]) {
                push(@res, shift @former);
            } else {
                push(@res, shift @latter);
            }
        }
        if (@former) {
            push(@res, @former);
        } else {
            push(@res, @latter);
        }
        if (defined $graph2[$depth]) {
            push @{$graph2[$depth]}, "{" . (join ", ", @res) . "}";
        } else {
            $graph2[$depth] = ();
            push @{$graph2[$depth]}, "{" . (join ", ", @res) . "}";
        }
        $depth--;
        return @res;
    }
}
```

1,2,2,3,4,6,7,8,9,10

```
[10, 2, 8, 9, 2, 1, 4, 7, 6, 3]
[10, 2, 8, 9, 2][1, 4, 7, 6, 3]
[10, 2, 8][9, 2][1, 4, 7][6, 3]
[10, 2][8][9][2][1, 4][7][6][3]
{2, 10}{8}{9}{2}{1, 4}{7}{6}{3}
{2, 8, 10}{2, 9}{1, 4, 7}{3, 6}
{2, 2, 8, 9, 10}{1, 3, 4, 6, 7}
{1, 2, 2, 3, 4, 6, 7, 8, 9, 10}
```