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Группа: М80-206Б-19
Номер по списку: 9

Тема: Знакомство с языком МИКРОЛИСП.
Отображение программ из МИКРОЛИСПа в С++.

Лабораторная работа N2
Распечатка файла golden21.cpp
>

```
// Епанешников М80-206Б-19
#include "mlisp.h"

extern double a;
extern double b;
extern double tolerance;
extern double total__iterations;
extern double xmin;
extern double mphi;

double fun(double x);
double golden__section__search(double a, double b);
double golden__start(double a, double b);
double __evs__try(double a, double b, double xa, double ya,
double xb, double yb);
bool close__enough_Q(double x, double y);

double a = 5.;
double b = 7.;

double fun(double x) {
   x = x - 109. / 110.;
   return expt(e, -x) + sin(x);
}

double golden__section__search(double a, double b) {
   {
      double xmin(a < b ? golden__start(a, b) :
golden__start(b, a));
      newline();
      return xmin;
```

```
   }
}

double golden__start(double a, double b) {
   total__iterations = 0;
   {
      double
         xa(a + mphi * (b - a)),
         xb(b + (-(mphi * (b - a))));
      return __evs__try(a, b, xa, fun(xa), xb, fun(xb));
   }
}

double mphi = (3. - sqrt(5.)) * (1. / 2.);

double __evs__try(double a, double b, double xa, double ya,
double xb, double yb) {
   return close__enough_Q(a, b) ? (a + b) * 0.5 :
      (
         display("+"),
         total__iterations = total__iterations + 1.,
         (ya < yb ?
         (
            b = xb,
            xb = xa,
            yb = ya,
            xa = a + mphi * (b - a),
            __evs__try(a, b, xa, fun(xa), xb, yb)
         ) :
         (
            a = xa,
            xa = xb,
            ya = yb,
            xb = b - mphi * (b - a),
            __evs__try(a, b, xa, ya, xb, fun(xb))
         ))
      );
}

bool close__enough_Q(double x, double y) {
   return __evs__abs(x - y) < tolerance;
}
```

```
double tolerance = 0.001;
double total__iterations = 0.;
double xmin = 0.;

int main() {
   xmin = golden__section__search(a, b);
   display("Interval=\t[");
   display(a);
   display(" , ");
   display(b);
   display("]\n");
   display("Total number of iterations=");
   display(total__iterations);
   newline();
   display("xmin=\t\t");
   display(xmin);
   newline();
   display("f(xmin)=\t");
   display(fun(xmin));
   newline();
   std::cin.get();
   return 0;
}
```

Распечатка файла golden21.ss

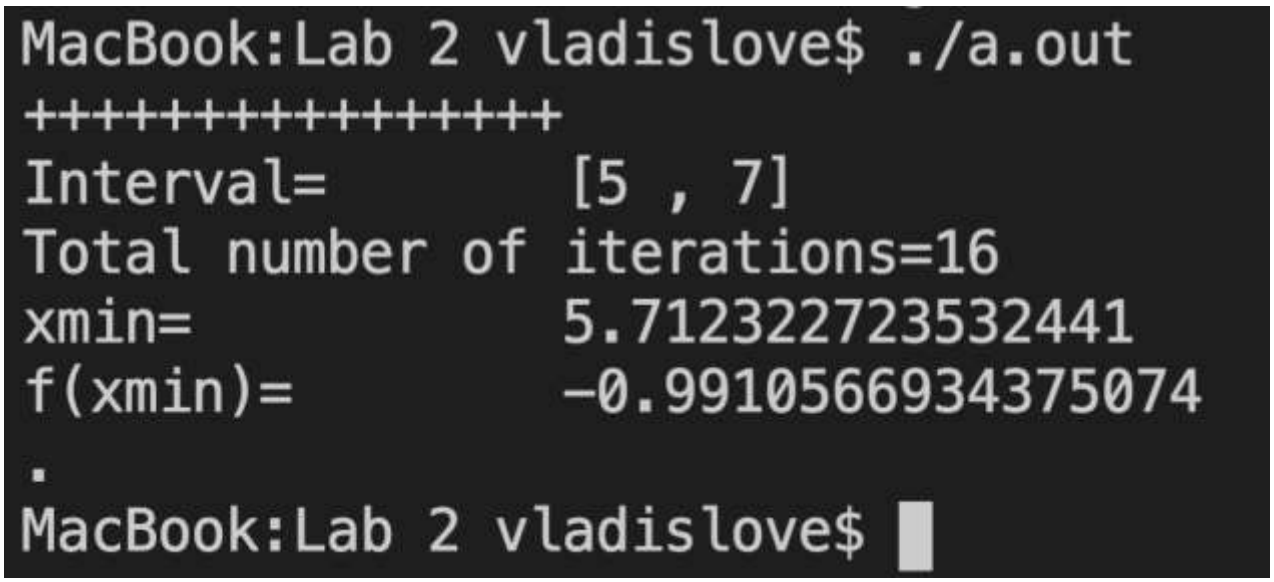
```
>
; golden21
; Епанешников М80-206Б-19
; [5, 7] 5,712
; e^(-z) +sin(z)
(define a 5)(define b 7)
(define (fun x)
 (set! x (- x (/ 109 110)))
 (+(exp(- x))(sin x))
)
(define (golden-section-search a bz)
 (let(
     (xmin(if(< a b)(golden-start a b)(golden-start b a )))
    )
    (newline)
    xmin
```

```
 )
)
(define (golden-start a b)
 (set! total-iterations 0)
 (let(
     (xa (+ a (* mphi(- b a))))
     (xb (+ b (-(* mphi(- b a)))))
    )
    (try a b xa (fun xa) xb (fun xb))
 )
)
(define mphi (* (- 3(sqrt 5))(/ 2.0)))
(define (try a b xa ya xb yb)
 (if(close-enough? a b)
     (* (+ a b)0.5)
     (let() (display "+")
          (set! total-iterations (+ total-iterations 1))
          (cond((< ya yb)(set! b xb)
                    (set! xb xa)
                    (set! yb ya)
                    (set! xa (+ a (* mphi(- b a))))
                    (try a b xa (fun xa) xb yb)
               )
               (else    (set! a xa)
                    (set! xa xb)
                    (set! ya yb)
                    (set! xb (- b (* mphi(- b a))))
                    (try a b xa ya xb (fun xb))
                )
          );cond...
     );let...
 );if...
)
(define (close-enough? x y)
  (<(abs (- x y))tolerance))
(define tolerance 0.001)
(define total-iterations 0)
(define xmin 0)
(set! xmin(golden-section-search a b))
  (display"Interval=\t[")
  (display a)
  (display" , ")
```

```
  (display b)
  (display"]\n")
  (display"Total number of iterations=")
total-iterations
  (display"xmin=\t\t")
xmin
  (display"f(xmin)=\t")
(fun xmin)
```

Скриншот запуска в C++

>



Скриншот запуска в DrRacket.

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