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Номер по списку: 1
Вариант: 208-29

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

Лабораторная работа N2
Распечатка файла golden-section20.cpp
>#include "mlisp.h"

```
double a = 1;
double b = 4;
double eps = 0.00001;
double mphi = 0;
double xmin = 0;

double fun(double x);
double golden__section__search(double a, double b);
double golden__start(double a, double b);
double __AJV__try(double a, double b, double xa, double
ya, double xb, double yb);

/*(define a 1)(define b 4); 3.47372
(define(fun x)
(set!x(-x(/ 29 30)))
(-x(atan(*2 x)) (log(*pi x)) 6)
)*/

double fun(double x) {
   x = x - (double)29 / 30;
   return x - atan(2 * x) - log(pi * x) - 6;
}

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) {
   mphi = 0.5 * (3 - sqrt(5));
   {
      double xa = a + mphi * (b - a);
      double xb = b - mphi * (b - a);
      return __AJV__try(a, b, xa, fun(xa), xb, fun(xb));
   }
}

double __AJV__try(double a, double b, double xa, double
ya, double xb, double yb) {
   return (abs(a - b) < eps ? (a + b) * 0.5
      : (true ?
      (display("+"), ya < yb ?
         b = xb,
         xb = xa,
         yb = ya,
         xa = a + mphi * (b - a),
         __AJV__try(a, b, xa, fun(xa), xb, yb)
         : (a = xa,
            xa = xb,
            ya = yb,
            xb = b - mphi * (b - a),
            __AJV__try(a, b, xa, ya, xb, fun(xb))))
         : _infinity));
}

int main() {
   xmin = golden__section__search(a, b);
   display("interval=\t[");
   display(a);
   display(" , ");
   display(b);
   display("]\n");
   display("xmin=\t\t");
   display(xmin); newline();
   display("f(xmin)=\t");
   display(fun(xmin)); newline();
   std::cin.get();
```

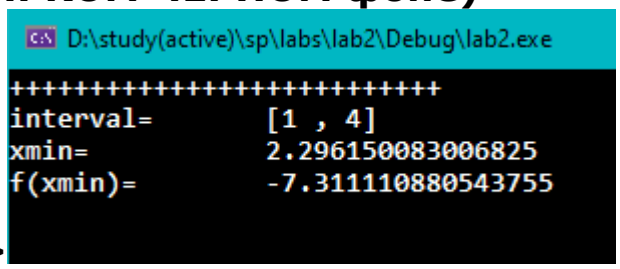
```
   return 0;
}
```

Распечатка файла golden-section20.ss

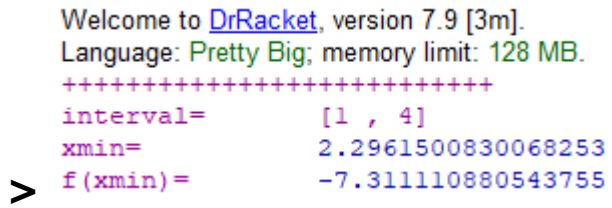
```
> ;golden-section20
(define a 1)(define b 4);2.29615
(define (fun x)
 (set! x (- x (/ 29 30)))
 (- x (atan(* 2 x)) (log(* pi x)) 6)
)

(define (golden-section-search a b)
 (let(
     (xmin(if(< a b)(golden-start a b)(golden-start b a )))
    )
    (newline)
    xmin
 )
)
(define (golden-start a b)
 (let(
     (xa (+ a (* mphi(- b a))))
     (xb (- b (* mphi(- b a))))
    )
    (try a b xa (fun xa) xb (fun xb))
 )
)
(define mphi (* 0.5(- 3(sqrt 5))))
(define (try a b xa ya xb yb)
 (if(close-enough? a b)
     (* (+ a b)0.5)
     (let() (display "+")
          (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 0.00001)
(define xmin 0)
(set! xmin(golden-section-search a b))
  (display"interval=\t[")
  (display a)
  (display" , ")
  (display b)
  (display"]\n")
  (display"xmin=\t\t")
xmin
  (display"f(xmin)=\t")
(fun xmin)
```

Скриншот запуска на C++(белый шрифт на ЯРКОМ ЧЕРНОМ фоне)



Скриншот запуска на Лиспе



Лабораторная работа N3

Распечатка файла coin20.cpp

```
>//coin20.cpp
#include "mlisp.h"

double VARIANT=29;
```

```
double LAST__DIGIT__OF__GROUP__NUMBER=8;
double KINDS__OF__COINS=5;
bool implication_Q(bool x_Q, bool y_Q);
double cc(double amount, double kinds__of__coins);
double count__change(double amount, double
kinds__of__coins);
double first__denomination(double kinds__of__coins);
double GR__AMOUNT();

bool implication_Q(bool x_Q, bool y_Q){
  return !(x_Q) || y_Q;
}

double cc(double amount, double kinds__of__coins){
  return
      ( amount == 0 ? 1
      : implication_Q(amount >= 0, kinds__of__coins == 0) ?
0
      : cc(amount, kinds__of__coins - 1) +
        cc(amount - first__denomination(kinds__of__coins),
          kinds__of__coins)
      );
}

double count__change(double amount, double
kinds__of__coins){
   display("count-change for ");
   display(amount);
   display(" ");
   display(kinds__of__coins);
   display(" \t= ");
   return
      ( amount > 0 &&
        kinds__of__coins > 0 &&
        first__denomination(kinds__of__coins) > 0 ?
                    cc(amount, kinds__of__coins)
      : (display("(improper parameter value) "), 0)
      );
}

double first__denomination(double kinds__of__coins){
   return
```

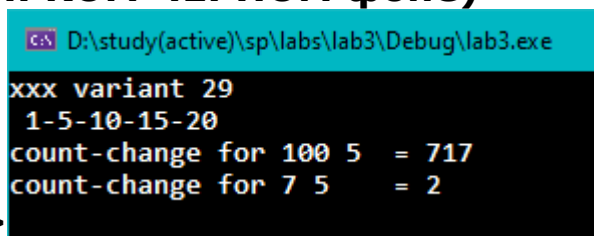
```
      (kinds__of__coins == 1 ? 1 :
       kinds__of__coins == 2 ? 5 :
       kinds__of__coins == 3 ? 10 :
       kinds__of__coins == 4 ? 15 :
       kinds__of__coins == 5 ? 20 :
       0
      );
}

double GR__AMOUNT(){
  return
   remainder(100 * LAST__DIGIT__OF__GROUP__NUMBER
+ VARIANT,
          137);
}

int main(){
 display ("xxx variant ");
 display (VARIANT);
 newline();
 display (" 1-5-10-15-20");
 newline();
 display (count__change(100, KINDS__OF__COINS) );
 newline();
 display (count__change(GR__AMOUNT(),
KINDS__OF__COINS) );
 newline();

 std::cin.get();
 return 0;
}
```

Распечатка файла coin20.ss

```
>(define (count-change amount)
  (cc amount 5))

(define (cc amount kinds-of-coins)
  (cond ((= amount 0) 1)
        ((or (< amount 0) (= kinds-of-coins 0)) 0)
        (else (+ (cc amount
                     (- kinds-of-coins 1))
                 (cc (- amount
```

```
                (first-denomination kinds-of-coins))
              kinds-of-coins)))))

(define (first-denomination kinds-of-coins)
  (cond ((= kinds-of-coins 1) 1)
        ((= kinds-of-coins 2) 5)
        ((= kinds-of-coins 3) 10)
        ((= kinds-of-coins 4) 15)
        ((= kinds-of-coins 5) 20)))

(define group 8)
(define variant 29)

(count-change 100)
(count-change (remainder (+ (* 100 group) variant) 137))
```

Скриншот запуска на C++(белый шрифт на ЯРКОМ ЧЕРНОМ фоне)



Скриншот запуска на Лиспе