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Группа: М8О-2086-19
Номер по списку: 2

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

Лабораторная работа N2

Распечатка файла golden21.cpp (ЖИРНЫЙ ШРИФТ, 14
пунктов, Verdana).

>

```
#include "mlisp.h"
```

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

```
double a = 2.;  
double b = 4.;  
double total__iterations = 0.;  
double mphi = (3. - sqrt(5.)) * (1. / 2.);  
double tolerance = 0.001;  
double xmin = 0.;
```

```
double fun(double x){  
    x = x - 102./103.;  
    return 2 * sin(x) * cos(x) - 0.5;  
}
```

```
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)));
```

```

        double xb(b - (mphi * (b - a)));
        return __klv__try(a, b, xa, fun(xa), xb, fun(xb));
    }
}

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

double __klv__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 += 1, (ya < yb ?
                (b = xb, xb = xa, yb = ya, xa = a + mphi * (b -
a), __klv__try(a, b, xa, fun(xa), xb, yb)) :
                (a = xa, xa = xb, ya = yb, xb = b - mphi * (b -
a), __klv__try(a, b, xa, ya, xb, fun(xb)))
            )
        );
};
}

int main(){
    xmin = golden__section__search(a, b);
    display("Interval = ["); display(a); display(", ");
display(b); display("]"); newline();
    display("Total number of iterations = ");
display(total__iterations); newline();
    display("xmin = "); display(xmin); newline();
    display("f(xmin) = "); display(fun(xmin)); newline();
}

```

Распечатка файла golden21.ss (ЖИРНЫЙ ШРИФТ, 14 пунктов, Verdana).

>

;golden21

```

(define a 2)
(define b 4)
(define total-iterations 0)
(define mphi (* (- 3(sqrt 5))(/ 2.0)))
(define tolerance 0.001)

```

```

(define xmin 0)

(define (fun x)
  (set! x (- x (/ 102 103)))
  (- (* 2 (sin x)(cos x)) 1/2)
)
(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)
  (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 (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))
(set! xmin(golden-section-search a b))
  (display"Interval=\t[")
  (display a)
  (display" , ")
  (display b)
  (display"]\n")
  (display"Total number of iteranions=")
total-iterations
  (display"xmin=\t\t")
xmin
  (display"f(xmin)=\t")
(fun xmin)

```

Скриншот запуска в С++ (белый шрифт на ЯРКОМ ЧЕРНОМ фоне)

>

```

"C:\Users\rocket\Desktop\СшёЄхь√ яЁюяЁрььшЁютрэш \lab02\golden21.exe"
+++++++
Interval = [2, 4]
Total number of iterations = 16
xmin = 3.346510986483542
f(xmin) = -1.499999998726475

Process returned 0 (0x0)   execution time : 0.044 s
Press any key to continue.

```

Скриншот запуска в DrRacket.

>

```

Welcome to DrRacket, version 8.0 [cs].
Language: Pretty Big; memory limit: 128 MB.
+++++++
Interval=          [2 , 4]
Total number of iteranions=16
xmin=              3.346510986483542
f (xmin)=          -1.4999999987264747
> |

```
