

Студент: Короткевич Л. В.
Группа: М8О-208Б-19
Номер по списку: 15

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

Лабораторная работа N3

> Распечатка файла coin21.ss
; coin21.ss

; coin22.ss

```
(define VARIANT 15)
(define LAST-DIGIT-OF-GROUP-NUMBER 8)
(define KINDS-OF-COINS 6)
```

```
(define (first-denomination kinds-of-coins)
  (cond
    ((= kinds-of-coins 1) 5)
    ((= kinds-of-coins 2) 10)
    ((= kinds-of-coins 3) 15)
    ((= kinds-of-coins 4) 20)
    ((= kinds-of-coins 5) 25)
    ((= kinds-of-coins 6) 50)
    (else 0)
  )
)
```

```
(define (count-change amount)
  (display"_____\n amount: ")
  (display amount)
  (newline)
  (display"KINDS-OF-COINS: ")
  (display KINDS-OF-COINS)
  (newline)
  (let(
    (largest-coin (first-denomination KINDS-OF-COINS))
  )
    (display"largest-coin: ")
  )
)
```

```

    (display largest-coin)
    (newline)
    (cond
      ((and (> amount 0) (> KINDS-OF-COINS 0) (>
largest-coin 0))
        (display "List of coin denominators: ")
        (denomination-list KINDS-OF-COINS)
        (display "count-change= ")
        (cc amount KINDS-OF-COINS)
      )
      (
        else (display "Improper parameter value!\ncount-
change= ")-1
      )
    )
  )
)

```

```

(define (pier? x? y?)
  (not (or x? y?))
)

```

```

(define (cc amount kinds-of-coins)
  (cond
    ((= amount 0) 1)
    ((pier? (< amount 0) (= kinds-of-coins 0))
      (+ (cc amount (- kinds-of-coins 1)) (cc (- amount
(first-denomination kinds-of-coins)) kinds-of-coins)))
    (else 0)
  )
)

```

```

(define (denomination-list kinds-of-coins)
  (cond
    ((= kinds-of-coins 0) (newline) 0)
    (else (display (first-denomination kinds-of-coins))
      (display " ")
      (denomination-list (- kinds-of-coins 1))
    )
  )
)

```

```
(define (GR-AMOUNT)
  (remainder (+ (* 100 LAST-DIGIT-OF-GROUP-NUMBER)
    VARIANT) 231)
)
```

```
(display "Variant ")
(display VARIANT)
(newline)
(newline)
(display (count-change 100)) (newline)
(display (count-change (GR-AMOUNT))) (newline)
(set! KINDS-OF-COINS 13)
(display (count-change 100)) (newline)
(display "(c) Korotkevich L. V. 2021\n")
```

```
> Распечатка файла coin21.cpp
//coin21.cpp
#include "mlisp.h"
```

```
extern double VARIANT;
extern double LAST__DIGIT__OF__GROUP__NUMBER;
extern double KINDS__OF__COINS;
```

```
double first__denomination(double kinds__of__coins);
double count__change(double amount);
bool pier_Q(bool x_Q, bool y_Q);
double cc(double amount, double kinds__of__coins);
double denomination__list(double kinds__of__coins);
double GR__AMOUNT();
```

```
// вариант - номер в списке группы
double VARIANT=15.;
// последняя цифра номера группы
double LAST__DIGIT__OF__GROUP__NUMBER=8.;
// количество имеющихся номиналов монет
double KINDS__OF__COINS=6.;
```

```
double first__denomination(double kinds__of__coins){
  return
    ( kinds__of__coins == 1. ? 5.
    : kinds__of__coins == 2. ? 10.
    : kinds__of__coins == 3. ? 15.
```

```

        : kinds__of__coins == 4. ? 20.
        : kinds__of__coins == 5. ? 25.
        : kinds__of__coins == 6. ? 50.
        : 0.
    );
}

double count__change(double amount){
    display( "_____\n amount: ");
    display( amount);
    newline();
    display( "KINDS-OF-COINS: ");
    display( KINDS__OF__COINS);
    newline();
    {
        double largest__coin
    (first__denomination( KINDS__OF__COINS));
        display( "largest-coin: ");
        display( largest__coin);
        newline();
        return
            ( amount > 0. &&
              KINDS__OF__COINS > 0. &&
              largest__coin > 0. ?
                ( display( "List of coin denominations: "),
                  denomination__list( KINDS__OF__COINS),
                  display( "count-change= "),
                  cc(amount, KINDS__OF__COINS)
                )
              : (display("Improper parameter value!\ncount-
change= "), -1.)
            );
    }
}

bool pier_Q(bool x_Q, bool y_Q){
// стрелка Пирса
    return !(x_Q || y_Q);
}

double cc(double amount, double kinds__of__coins){
    return

```

```

    ( amount == 0. ? 1.
    : pier_Q(amount < 0., kinds__of__coins == 0.) ?
      cc(amount, kinds__of__coins - 1.) +
      cc(amount - first__denomination(kinds__of__coins),
        kinds__of__coins)
    : 0.
    );
}

```

```

double denomination__list(double kinds__of__coins){
    return ( kinds__of__coins== 0 ? (newline() , 0.)
    :
    (display(first__denomination(kinds__of__coins)),
      display(" "),
      denomination__list(kinds__of__coins - 1.)
    )
    );
}

```

```

double GR__AMOUNT(){
    return
    remainder(100. * LAST__DIGIT__OF__GROUP__NUMBER
+ VARIANT,
    231);
}

```

```

int main(){
    display ("Variant ");
    display (VARIANT);
    newline();
    newline();
    display (count__change(100.) ); newline();
    display (count__change(GR__AMOUNT()) ); newline();
    KINDS__OF__COINS=13.;
    display (count__change(100.) ); newline();
    display ("(c) Korotkevich L. V. 2021\n");

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

```

> Скриншот запуска в C++

```
[leo@pc lab03]$ ./coin21
Variant 15

amount: 100
KINDS-OF-COINS: 6
largest-coin: 50
List of coin denominations: 50 25 20 15 10 5
count-change= 223

amount: 122
KINDS-OF-COINS: 6
largest-coin: 50
List of coin denominations: 50 25 20 15 10 5
count-change= 0

amount: 100
KINDS-OF-COINS: 13
largest-coin: 0
Improper parameter value!
count-change= -1
(c) Golikov K.P. 2021
```

> Скриншот запуска в DrRacket.

