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Номер по списку: 21

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

Лабораторная работа N3

Распечатка файла coin21.ss

```
; coin21.ss
(define VARIANT 21)
(define LAST-DIGIT-OF-GROUP-NUMBER 8)
(define KINDS-OF-COINS 5)

(define (first-denomination kinds-of-coins)
  (cond((= kinds-of-coins 1) 1)
        ((= kinds-of-coins 2) 3)
        ((= kinds-of-coins 3) 10)
        ((= kinds-of-coins 4) 20)
        ((= kinds-of-coins 5) 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 denominations: ")
      (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) Moiseenkov I.P. 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=21.;
// последняя цифра номера группы
double LAST__DIGIT__OF__GROUP__NUMBER=8.;
// количество имеющихся номиналов монет
double KINDS__OF__COINS=5.;

double first__denomination(double kinds__of__coins){
    return
        ( kinds__of__coins == 1. ? 1.
          : kinds__of__coins == 2. ? 3.
          : kinds__of__coins == 3. ? 10.
          : kinds__of__coins == 4. ? 20.
          : kinds__of__coins == 5. ? 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);
}

```

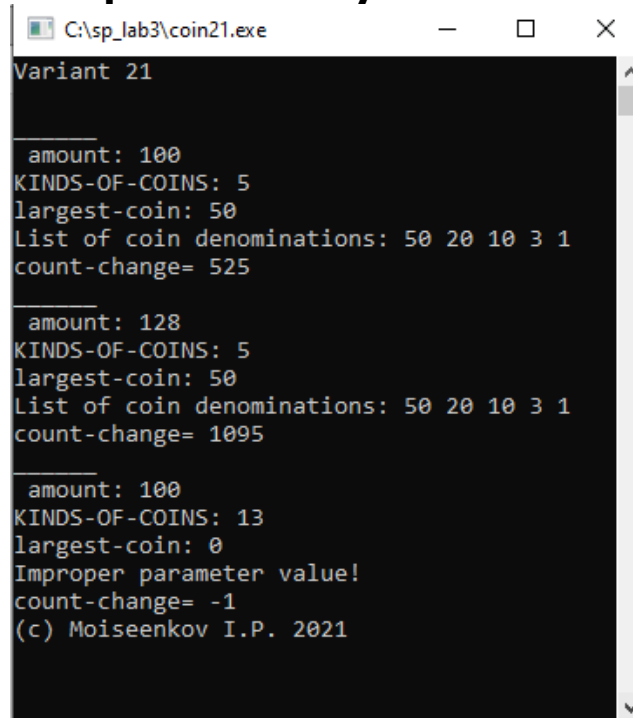
```

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) Moiseenkov I.P. 2021\n");

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

```

Скриншот запуска в C++.



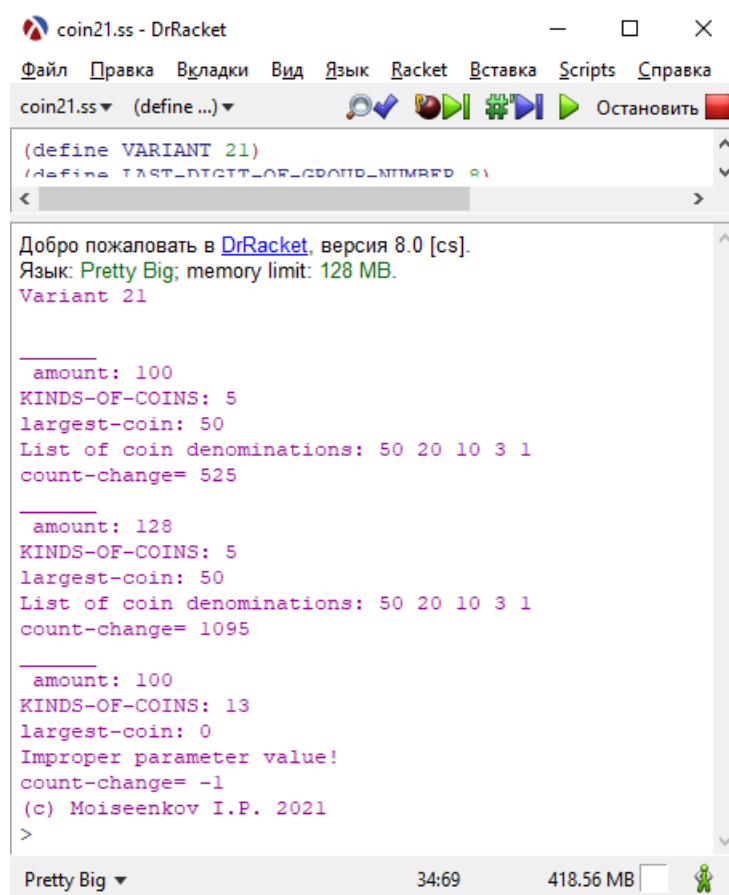
```
C:\sp_lab3\coin21.exe
Variant 21

amount: 100
KINDS-OF-COINS: 5
largest-coin: 50
List of coin denominations: 50 20 10 3 1
count-change= 525

amount: 128
KINDS-OF-COINS: 5
largest-coin: 50
List of coin denominations: 50 20 10 3 1
count-change= 1095

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

Скриншот запуска в DrRacket.



```
coin21.ss - DrRacket
Файл Правка Вкладки Вид Язык Racket Вставка Scripts Справка
coin21.ss (define ...)
(define VARIANT 21)
(define LAST-DIGIT-OF-GROUND-NUMBER 8)

Добро пожаловать в DrRacket, версия 8.0 [cs].
Язык: Pretty Big; memory limit: 128 MB.
Variant 21

amount: 100
KINDS-OF-COINS: 5
largest-coin: 50
List of coin denominations: 50 20 10 3 1
count-change= 525

amount: 128
KINDS-OF-COINS: 5
largest-coin: 50
List of coin denominations: 50 20 10 3 1
count-change= 1095

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

Pretty Big 34:69 418.56 MB
```