11,12-Ma’ruza. C++ da funksiyalar: tuzilishi va undan foydalanish. . Qiymat qaytarmaydigan funksiyalar va ular yordamida masala yechish

Ma’ruza rejasi:

11.1 Funksiya tushunchasi

11.2 Funksiya parametrlari

11.3 Funksiyadan foydalanish

Kalit so’zlar:*, ro’yxat, manzil, nolinchi ko’rchsatkich, tugun, adres olish &, bo’shatish, ko’rsatkich, virtual destruktor, xotira, xotira chiqishi, destruktor, toifani o’zlashtirish, resurslar chiqishi, a’zo destruktori.*

Programma ta’minotini yaratish amalda murakkab jarayon hisoblanadi. Programma tuzuvchi programma kompleksini bir butun-likdagi va uning har bir bo‘lagining ichki mazmunini va ularning sezilmas farqlarini hisobga olishi kerak bo‘ladi.

Programmalashga tizimli yondoshuv shundan iboratki, program-ma tuzuvchi oldiga qo‘yilgan masala oldindan ikkita, uchta va undan ortiq nisbatan kichik masala ostilarga bo‘linadi. O‘z navbatida bu masala ostilari ham yana kichik masala ostilariga bo‘linishi mumkin. Bu jarayon toki mayda masalalarni oddiy standart amallar yordamida echish mumkin bo‘lguncha davom etadi. SHu yo‘l bilan masalani dekompozitsiyalash amalga oshiriladi.

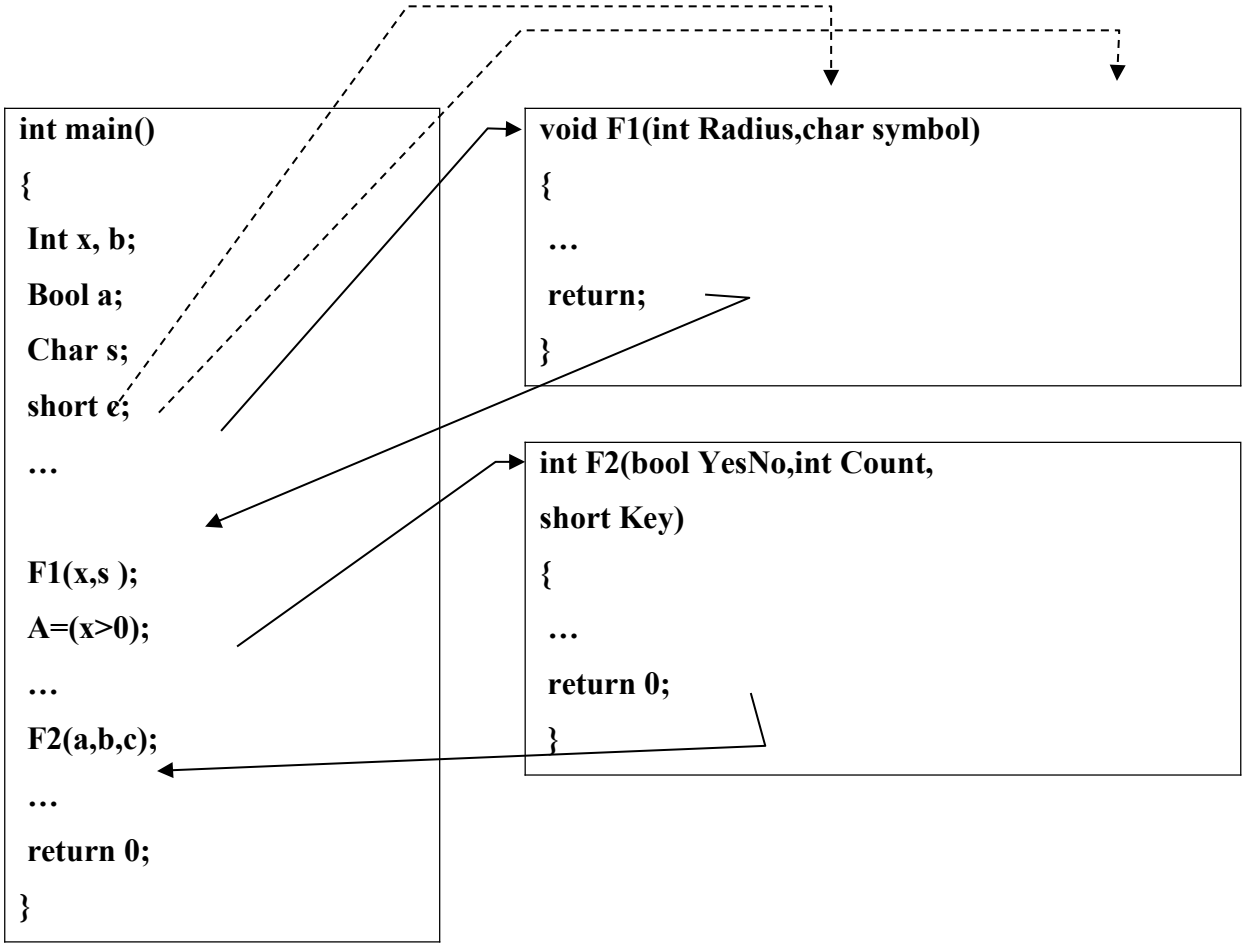
Ikkinchi tomondan, programmalashda shunday holatlar kuzatila-diki, unda programmaning turli joylarida mazmunan bir xil algo-ritmlarni bajarishga to‘g‘ri keladi. Algoritmning bu bo‘laklari asosiy echilayotgan masaladan ajratib olingan qandaydir masala ostini echishga mo‘ljallangan bo‘lib, etarlicha mustaqil qiymatga (natijaga) egadir. Misol uchun quyidagi masalani ko‘raylik:

Berilgan $a_0,a_1,...,a_{30}$, $b_0,b_1,...,b_{30}$, $c_0,c_1,...,c_{30}$ va x,y,z haqiqiy sonlar uchun

$$\frac{\left(a_0x^{30}+a_1x^{29}+...+a_{30}\right)^2-\left(b_0y^{30}+b_1y^{29}+...+b_{30}\right)}{c_0(x+z)^{30}+c_1(x+z)^{29}+...+c_{30}}$$

ifodaning qiymati hisoblansin.

Funksiya tanasidagi return operatori yoki oxirgi operator bajargandan keyin avtomatik ravishda bosh funksiyaga qaytish amalga oshiriladi.



11.1-rasm. Bosh funksiyadan boshqa funksiyalarni chaqirish va qaytish

Aksariyat hollarda main() funksiyasining parametrlar ro‘yxati bo‘sh bo‘ladi. Agar yuklanuvchi programmani ishga tushirishda,buyruq satri orqali yuklanuvchi programma ishga tushirilganda, unga parametrlarni uzatish (berish) zarur bo‘lsa, main() programmasi funksiyasining sintaksisi o‘zgaradi:

int main(int argc, char* argv[]);

Bu erda argc - uzatiladigan parametrlar soni, argv[]- bir-biridan punktuatsiya belgilari (va probel) bilan ajratilgan parametrlar ro‘yxatini o‘z ichiga olgan massivga ko‘rsatkich.

Quyida funksiyalarni e’lon qilish, chaqirish va aniqlashga misollar keltirilgan:

```
// funksiyalar e’loni
int Mening_funksiyam(int Number,
float Point);
char Belgini_uqish();
void bitni_urnatish(short Num);
void Amal_yoq(int,char);
// funksiyalarni chaqirish
result=Mening_funksiyam(Varb1,3.1
4);
symb=Belgini_uqish();
bitni_urnatish(3);
Amal_yoq(2,Smbl);
// funksiyalarni aniqlash
int Mening_funksiyam(int
Number,float Point);
{ int x;
 ...
 return x;}
```

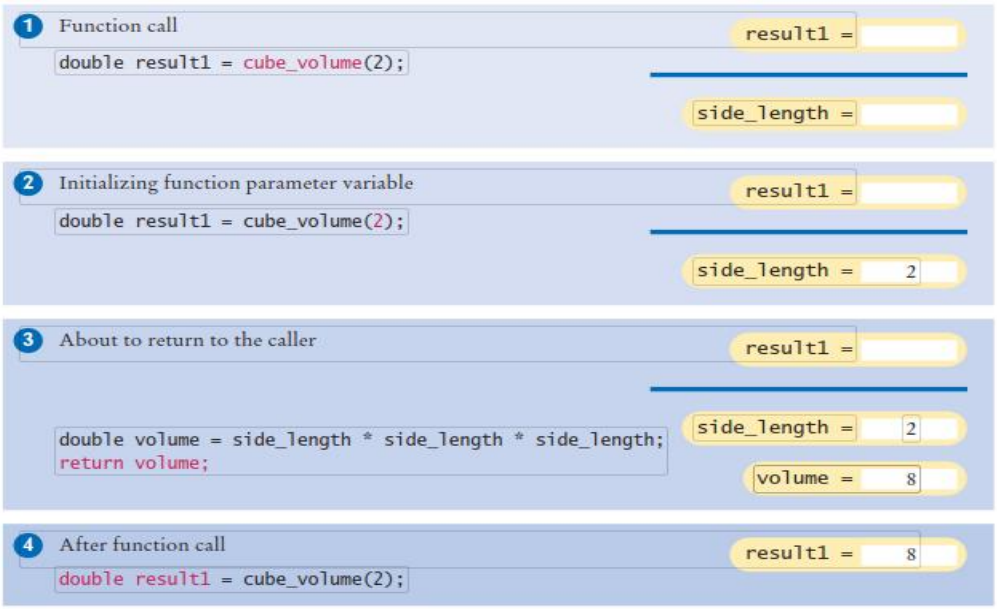
```
char Belgini_uqish()
{
 char Symbol;
 cin>>Symbol;
 return Symbol;
};
```

```
void bitni_urnatish(short number)
{
 global_bit=global_bit | number;
};
void Amal_yoq(int x, char ch){};
```

Misollar

ch05/cube.cpp

```
1 #include <iostream>
2
3 using namespace std;
4
5 /**
6  Computes the volume of a cube.
7 @param side_length the side
length of the cube
8 @return the volume
9 */
10 double cube_volume(double
side_length)
11 {
12 double volume = side_length *
side_length * side_length;
13 return volume;
14 }
15
16 int main()
17 {
18 double result1 = cube_volume(2);
19 double result2 = cube_volume(10);
20 cout << "A cube with side length 2
has volume " << result1 << endl;
21 cout << "A cube with side length 10
has volume " << result2 << endl;
22
23 return 0;
24 }
```



ch05/intname.cpp

```
1 #include <iostream>
2 #include <string>
3
4 using namespace std;
5
6 /**
7  Turns a digit into its English name.
8 @param digit an integer between 1 and 9
9 @return the name of digit (“one” ... “nine”)
10 */
11 string digit_name(int digit)
12 {
13 if (digit == 1) return "one"; 14 if (digit == 2) return "two"; 15 if (digit == 3) return "three";
16 if (digit == 4) return "four"; 17 if (digit == 5) return "five"; 18 if (digit == 6) return "six";
19 if (digit == 7) return "seven"; 20 if (digit == 8) return "eight"; 21 if (digit == 9) return "nine";
22 return "";
23 }
24
25 /**
26  Turns a number between 10 and 19 into its English name.
27 @param number an integer between 10 and 19
28 @return the name of the given number (“ten” ... “nineteen”)
29 */
30 string teen_name(int number)
31 {
32 if (number == 10) return "ten";
33 if (number == 11) return "eleven";
34 if (number == 12) return "twelve";
35 if (number == 13) return "thirteen";
36 if (number == 14) return "fourteen";
```

```
37 if (number == 15) return "fifteen";
38 if (number == 16) return "sixteen";
39 if (number == 17) return
"seventeen";
40 if (number == 18) return
"eighteen";
41 if (number == 19) return
"nineteen";
42 return "";
43 }
44
45 /**
46  Gives the name of the tens part of
a number between 20 and 99.
47 @param number an integer
between 20 and 99
48 @return the name of the tens part
of the number ("twenty" ... "ninety") 49 */
50 string tens_name(int number)
51 {
52 if (number >= 90) return "ninety";
53 if (number >= 80) return "eighty";
54 if (number >= 70) return
"seventy";
55 if (number >= 60) return "sixty";
56 if (number >= 50) return "fifty";
57 if (number >= 40) return "forty";
58 if (number >= 30) return "thirty";
59 if (number >= 20) return "twenty";
60 return "";
61 }
62
63 /**
64  Turns a number into its English
name.
65 @param number a positive integer
< 1,000
66 @return the name of the number
(e.g. "two hundred seventy four")
67 */
68 string int_name(int number)
69 {
70 int part = number; // The part that
still needs to be converted
71 string name; // The return value
72
73 if (part >= 100)
74 {
75  name = digit_name(part / 100) + "
hundred"; 76  part = part % 100;
77 }
78
79 if (part >= 20)
80 {
81  name = name + " " + tens_name(part);
82  part = part % 10;
83 }
84 else if (part >= 10)
85 {
86  name = name + " " + teen_name(part);
87  part = 0;
88 }
89
90 if (part > 0)
91 {
92  name = name + " " +
digit_name(part);
93 }
94
95 return name;
```

```
96 }
97
98 int main()
99 {
100 cout << "Please enter a positive
integer: "; 101 int input;
102 cin >> input;
103 cout << int_name(input) << endl;
104 return 0;
105 }
```

program run

Please enter a positive integer: 729

seven hundred twenty nine

Nazorat savollari

1. C++da funksiya qanday ishlaydi?
2. funksiyaga kutubxona kerakmi?
3. For operatori funksiyada qanday ishlatiladi?
4. Matematik funksiyalar qanday ishlaydi?
5. Funksiya parametrlar nima?
6. Funksiya qanday chaqiriladi?
7. Funksiya parametrlari orqali nima uzatiladi?
8. If operatorining nechta turi bor?
9. O’zgaruvchilar nima uchun qo’llaniladi?