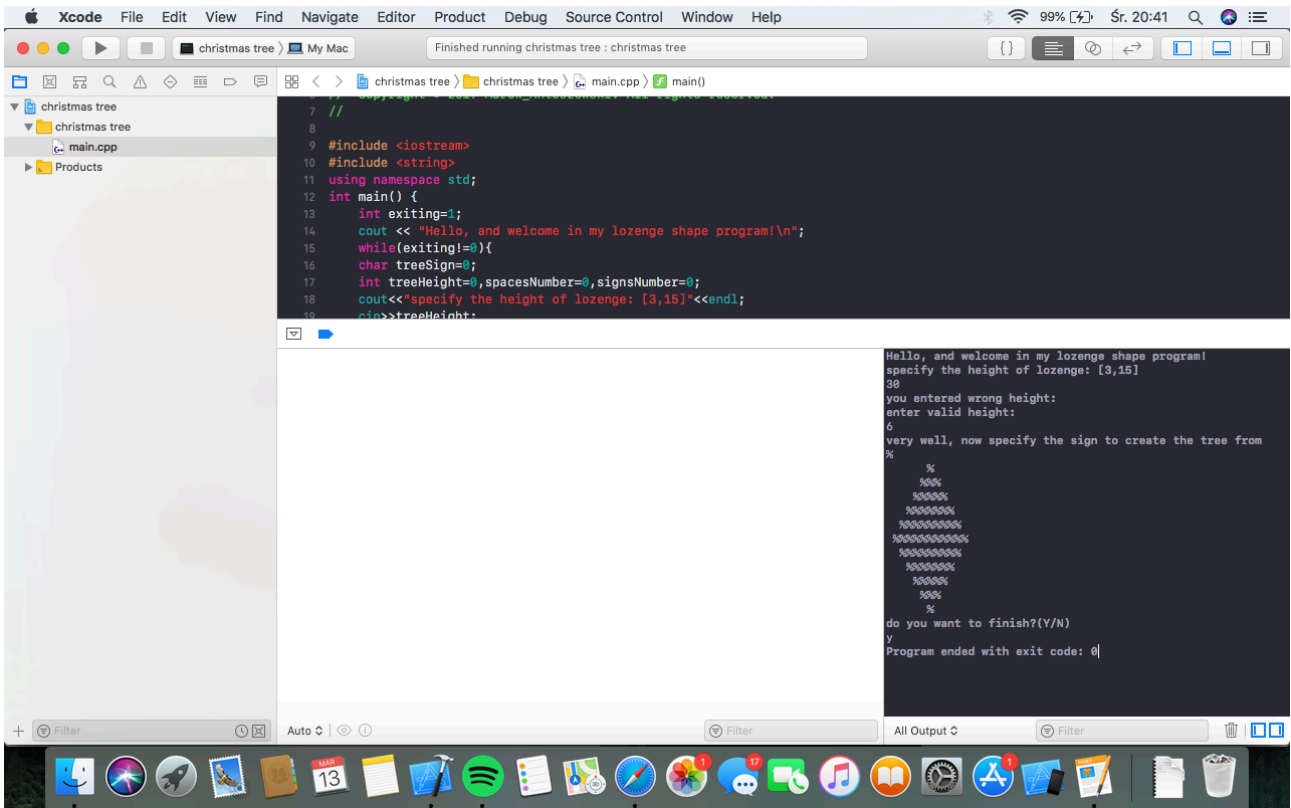


LAB 1 MAREK ANTOSZEWSKI 249113  
Task1.



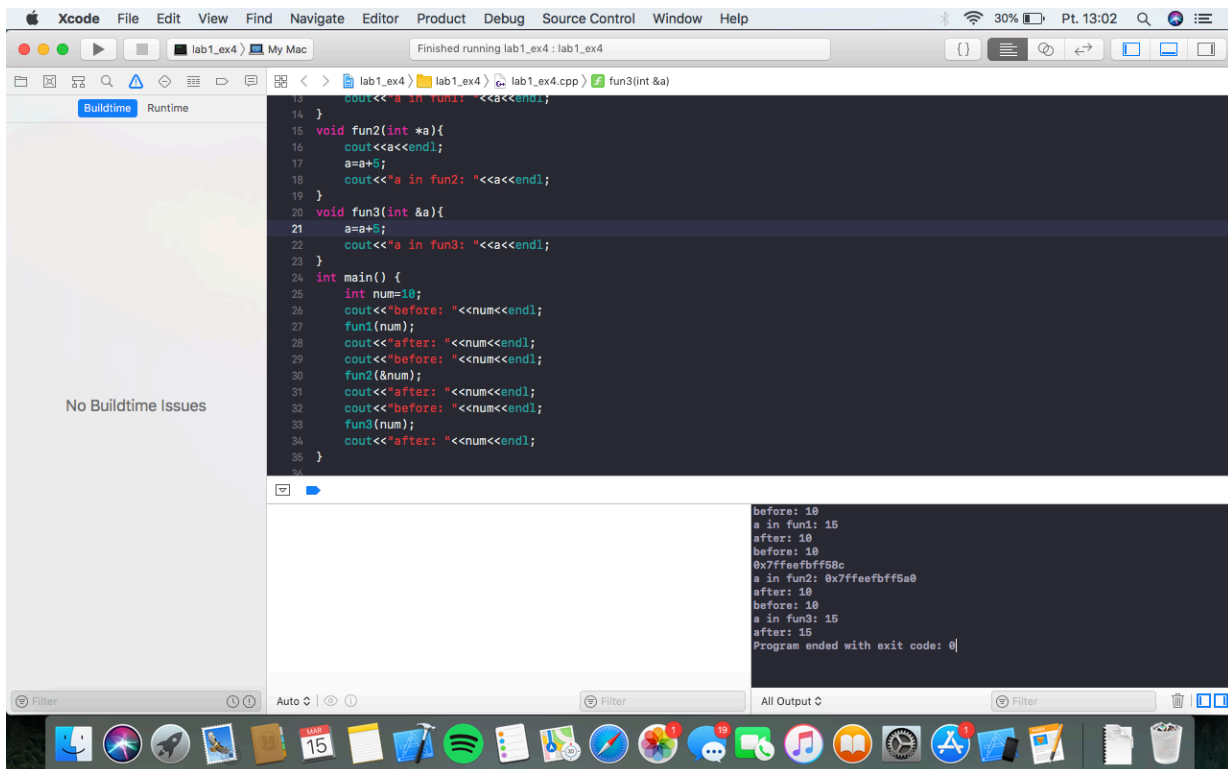
**Task2.** In c language to allocate dynamically memory, we use function malloc, or calloc(the difference is that calloc takes two parameters -the number of array elements and the size of each element, malloc needs only size of the requested memory in bytes. And to free the memory we use free function, which deallocates the memory.

In c++ language we use new operator to allocate space for single object, or array of objects. To deallocate memory we use delete command which deletes either one object or array of objects (then we need to add [] operator after typing „delete”).

### Task3.

A pointer variable is a variable that copies the address of pointed variable (points to its address), the reference variable is a variable that has the same address like the referenced. (reference variable when printed will show the value of variable which it is referring to. If we change reference variable, the referred variable is changed too.)

## Task4.



```
13 cout<<"a in fun1: "<<a<<endl;
14 }
15 void fun2(int &a){
16     cout<<a<<endl;
17     a=a+5;
18     cout<<"a in fun2: "<<a<<endl;
19 }
20 void fun3(int &a){
21     a=a+5;
22     cout<<"a in fun3: "<<a<<endl;
23 }
24 int main() {
25     int num=10;
26     cout<<"before: "<<num<<endl;
27     fun1(num);
28     cout<<"after: "<<num<<endl;
29     cout<<"before: "<<num<<endl;
30     fun2(&num);
31     cout<<"after: "<<num<<endl;
32     cout<<"before: "<<num<<endl;
33     fun3(num);
34     cout<<"after: "<<num<<endl;
35 }
36
```

before: 10  
a in fun1: 15  
after: 10  
before: 10  
a in fun2: 0x7ffefbfff58c  
after: 10  
before: 10  
a in fun3: 15  
after: 15  
Program ended with exit code: 0

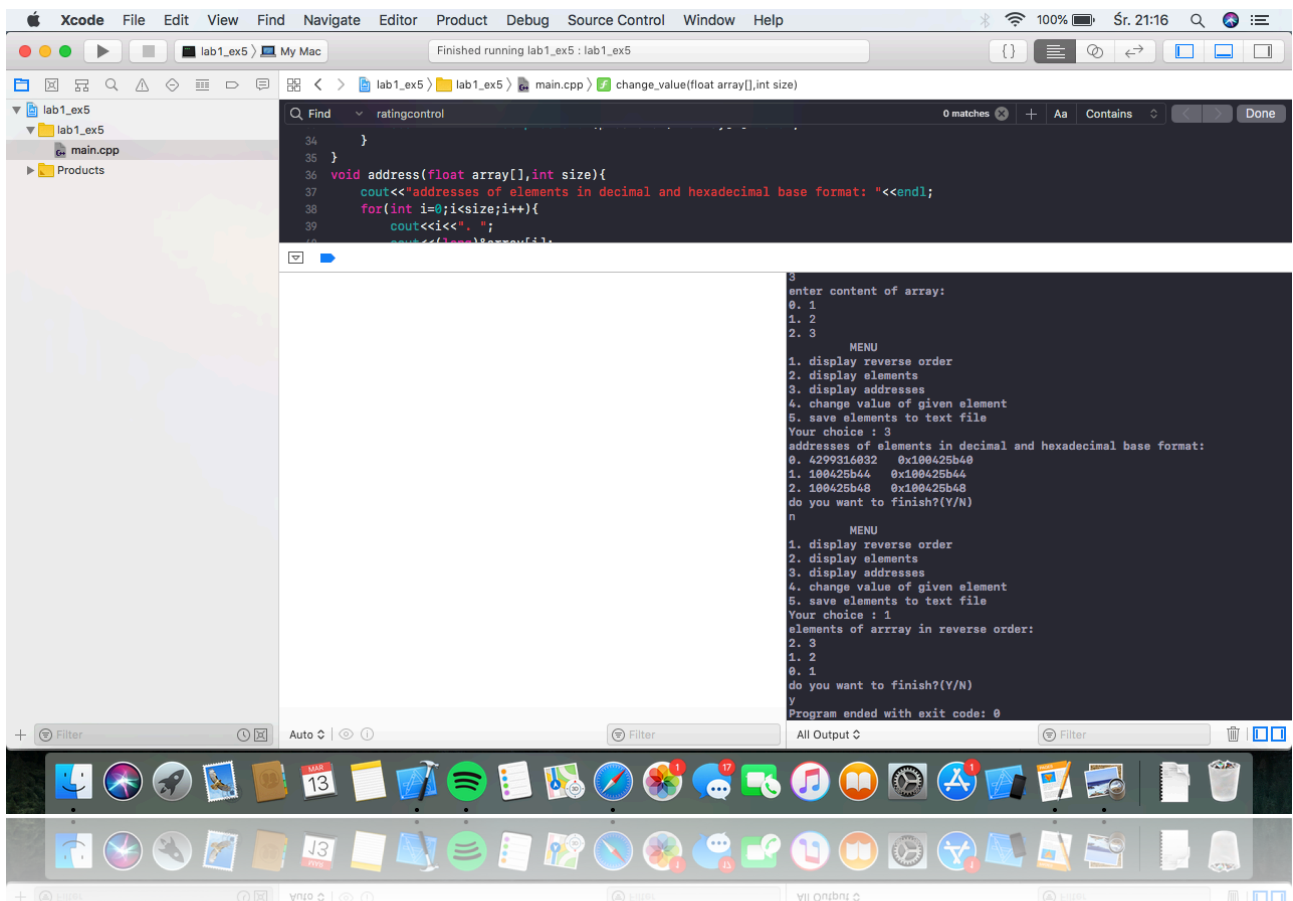
As can see

Function fun1 returns value 15, but does not change value of num, because fun1, operates on copy of num value,(that's why value of num is not changing at all)

Function fun2 operates on copy of address of num variable,(function copy address and moves this copy)

Function fun3 gets copy of address of num variable, and operates on its content.(function operates on variable placed at address of „a” parameter)

## Task5.



```
34 }
35 }
36 void address(float array[],int size){
37     cout<<"addresses of elements in decimal and hexadecimal base format: "<<endl;
38     for(int i=0;i<size;i++){
39         cout<<i<<". ";
40         cout<<endl;
41     }
42 }
43
```

enter content of array:  
0. 1  
1. 2  
2. 3  
MENU  
1. display reverse order  
2. display elements  
3. display addresses  
4. change value of given element  
5. save elements to text file  
Your choice : 3  
addresses of elements in decimal and hexadecimal base format:  
0. 4299316032 0x100425b40  
1. 100425b44 0x100425b44  
2. 100425b48 0x100425b48  
do you want to finish?(Y/N)  
n  
MENU  
1. display reverse order  
2. display elements  
3. display addresses  
4. change value of given element  
5. save elements to text file  
Your choice : 1  
elements of array in reverse order:  
2. 3  
1. 2  
0. 1  
do you want to finish?(Y/N)  
y  
Program ended with exit code: 0

