

Exercise # 5 (31-10-2001)

Exercise 1

State the difference between the following terms:

- call by value, call by reference
- Scope, lifetime
- Local variable, global variable

Exercise 2

Given the declarations

```
const int ANGLE = 90;  
char letter;  
int number;
```

Indicate whether each of the following actual parameters would be valid using pass-by-value, pass-by-reference, or both.

- letter
- ANGLE
- number
- number + 3
- 23
- ANGLE * number
- abs(number) where abs is a function that returns the absolute value of a number

Exercise 3

The program below has a function named Change. Fill in the values of all variables before and after the function is called. Then fill in the values of all variables after the return to the main function. (if any value is undefined, write u instead of a number)

```
#include <iostream.h>  
  
void Change(int, int&);  
  
int main ()  
{  
    int a ;  
    int b;  
    a = 10;  
    b = 7;  
    Change(a,b);  
    cout << a << ' ' << b << endl;  
    return 0;  
}
```

```
void Change (int x, int& y)
{
    int b;
    b = x;
    y = y + b;
    x = y;
}
```

Variables in main just before Change is called:

a _____
b _____

Variables in Change at the moment control enters the function:

x _____
y _____
b _____

Variables in main after return from Change:

a _____
b _____

Exercise 4:

What is the output of the following C++ program? Can you guess which case do the given functions test (local scope, global scope, call by value, call by reference).

```
#include <iostream.h>
```

```
int x;
```

```
void func1(int& a)
```

```
{
    a = 3;
}
```

```
void func2(int b)
```

```
{
    b = 4;
}
```

```
void func3()
```

```
{
    int x;
    x = 5;
}
```

```
void func4()
```

```
{
    x = 7;
}
```

```

int main()
{
    x = 15;
    func1(x);
    cout << x << endl;

    x = 16;
    func2(x);
    cout << x << endl;

    x = 17;
    func3();
    cout << x << endl;

    x = 18;
    func4();
    cout << x << endl;

    return 0;
}

```

Exercise 5:

For each of the following, decide whether a value-returning function or a void function is the most appropriate implementation

- a. Selecting the larger of two values for further processing in an expression.
- b. Printing a paycheck.
- c. Computing the area of a hexagon.
- d. Testing whether an incoming value is valid and returning TRUE if it is.
- e. Computing the two roots of a quadratic equation.

Voluntary exercises:

Write program that transfers FIM to Euro, or Euro to FIM. Print result with 4 decimal precision (be talkative, make sure user know what is happening all the time).

Note: First thing your program should do is to ask which transfer user wants to make.

Note2: “Do not start with program until you understand problem and figure out solution yourself.”