# TP 2 - Problem 2 - I

```cpp
#include <iostream>

// Pass-by-reference and returns a reference.
int &f(int &a) {
  // Assign the caller variable.
  a = a + 5;
  return a;
}

// Pass-by-reference and returns a value.
int f1(int &a) {
  // Assign the caller variable.
  a = a + 5;
  return a;
}

// Pass-by-value and returns a reference to a temporary.
int &f2(int a) {
  // Assign a local variable which is a copy of the caller variable.
```

# TP 2 - Problem 2 - II

```
20      a = a + 5;
21      return a; // Dangling reference...
22    }
23
24    // Pass-by-value and returns a value.
25    int f3(int a) {
26      // Assign a local variable which is a copy of the caller variable.
27      a = a + 5;
28      return a;
29    }
30
31    int main() {
32      int a = 5;
33      for (int i = 0; i < 2; i++) {
34        std::cout << "f i = " << i << " a = " << a << '\n';
35        f(a)++;
36        std::cout << "f i = " << i << " a = " << a << '\n';
37      }
38      std::cout << f(a);
39      std::cout << '\n';
```

# TP 2 - Problem 2 - III

```
40      //           {
41      //   int a = 5;
42      //   for (int i = 0; i < 2; i++) {
43      //     std::cout << "f1 i = " << i << " a = " << a << '\n';
44      //     f1(a)++; error: lvalue required as increment operand
45      //     std::cout << "f1 i = " << i << " a = " << a << '\n';
46      //   }
47      //   std::cout << f1(a);
48      //          std::cout << '\n';
49      //          }
50          {
51            int a = 5;
52            for (int i = 0; i < 2; i++) {
53              std::cout << "f2 i = " << i << " a = " << a << '\n';
54              f2(a)++;
55              std::cout << "f2 i = " << i << " a = " << a << '\n';
56            }
57            std::cout << f2(a);
58            std::cout << '\n';
59          }
```

# TP 2 - Problem 2 - IV

```
60     //          {
61     //   int a = 5;
62     //   for (int i = 0; i < 2; i++) {
63     //     std::cout << "f3 i = " << i << " a = " << a << '\n';
64     //     f3(a)++; error: lvalue required as increment operand
65     //     std::cout << "f3 i = " << i << " a = " << a << '\n';
66     //   }
67     //   std::cout << f3(a);
68     //          std::cout << '\n';
69     //          }
70     return 0;
71   }
```

# TP 2 - Problem 2 - V

Possible output:

```
1  f i = 0 a = 5
2  f i = 0 a = 11
3  f i = 1 a = 11
4  f i = 1 a = 17
5  22
6  f2 i = 0 a = 5
7  Erreur de segmentation
```