Class Task Intermediate

0. Swap

refer to the notes

1. Boring Task

Make a function `bored` which can make any variable value to be 0, supported variable type: `bool` `int` `float` `double` `char`

```
int a = 4;
cout<<a; //4
bored(a);
cout<<a; //0
bool b = true;
cout<<b; //1
bored(b);
cout<<b; //0
```

2. Master mind

Generate four unique random numbers ${n_1,n_2,n_3,n_4}$, where $0 \leq n_i < 10$, and prompt users to input 4 numbers, and output “A” value and “B” value, where A is number of numbers guessed exist in the answer, B is the number of numbers guessed located at the corresponding position of the answer. Here is a sample IO. Suppose the answer is 9, 4, 5,

```
Welcome to mastermind <3
Please make a guess :)
> 1 2 3 4
A:2 B:0
Please make a guess :)
> 9 0 4 1
A:3 B:2
Please make a guess :)
>9 4 5 1
A:4 B:4
Bingo! The answer is 9 4 5 1
```

3. Another swap

create struct Foo and function swap1 and swap2

```
int main(){
    Foo foo = {3,4};
    cout<<foo.a<<" "<<foo.b; //3,4
    swap1(foo);
    cout<<foo.a<<" "<<foo.b; //4,3
    swap2(&foo);
    cout<<foo.a<<" "<<foo.b; //3,4
}
```

}

4. Compressed Memory

Create a `Memory` class, which contains some private member variables: `int32_t a`, `std::vector<float> b`, `bool c`, `std::string d`. You need to provide getter and setter for them. There is a function compress which compress a,b,c,d into a single char array (not vector), and a function `extract` which convert the char array back to value of a,b,c,d. You can decide how to manage the data structure inside the char array, but the size cannot exceed the original size*2 (size of int32_t is 4 byte, a single char is 1 byte, dont stringify the int). You need to implement a default constructor, copy constructor, and a constructor which accepts the char array.