

Assignment 8: Classes, Constructors, Destructors, Overloading

Due on April 25, Monday, 40 points

Consider the following definition of class myArray:

```
class myArray
{
public:
    myArray();                // Default constructor;
    myArray(int s, double iv); // s:size; iv:initial values;
    ~myArray();              // Destructor;
    double & operator [] (int i); // Return the ith element in the array;
    double average();        // Return the average of the numbers in the array;
    int max();               // Return the biggest number's index in the array;
    int min();              // Return the smallest number's index in the array;
    int getsize();          // Return the size of the array;

private:
    int ArraySize;
    double *A;
};
```

The [] operator is implemented as follows:

```
double & myArray::operator[] (int i)
{
    if ( i >= ArraySize)
        { cout << "Out of range:"; return A[0]; }
    return A[i];
}
```

1. Implement the rest of the class.
2. Write a function with the following prototype:

```
myArray fibonacci(int n);
```

For any integer $n \geq 0$, `fibonacci(n)` returns a `myArray` of n fibonacci numbers, $f_0, f_1, f_2, \dots, f_{n-1}$, stored in `myArray` at the corresponding positions of the array. The fibonacci numbers are defined as follows:

$$f_0 = 0, f_1 = 1, \text{ and for } n \geq 2, f_n = f_{n-1} + f_{n-2}.$$

For example, if we write

```
myArray A = fibonacci(50);
```

Then `A[0] = f_0, A[1] = f_1, A[2] = f_2, ..., A[49] = f_49`, and `A[50]` will get the error message indicating that 50 is out of the range.

3. Also, write a function with the following prototype that will put n random numbers into a `myArray` and return it.

```
myArray Rand(int n);
```

4. In your main function, let `F` and `R` be two objects of type `myArray`. Use a for loop to assign `F = fibonacci(n)` and `R = Rand(n)` for $n = 10, 20, 30, \dots, 100$ and use the member functions of `myArray` to get minimum, maximum, and average of the numbers in `F` and `R` in each size.

Note: This assignment carries 40 points. You haven't asked to correctly implement the Big Three, which will be in the next assignment. Don't forget to have your name on your works.