```
/*
 * SavingsAccount.h
 *
 *  Created on: Oct 23, 2013
 *      Author: Nathaniel Gallinger
 */

#ifndef SAVINGSACCOUNT_H_
#define SAVINGSACCOUNT_H_

namespace NathanielGallinger
{
  class SavingsAccount
  {
  public:
    // Constructor
    SavingsAccount(double savingsBalance);

    // Accessor and Mutator
    inline double getSavingsBalance() const;
    static void setAnnualInterestRate(double annualInterestRate);

    // Display function
    void applyMonthlyInterest();


  private:
    // Private data members
    double savingsBalance;
    static double annualInterestRate;
  };

  // Accessor
  inline double SavingsAccount::getSavingsBalance() const
  {
    return savingsBalance;
  }
}

#endif /* SAVINGSACCOUNT_H_ */


/*
 * SavingsAccount.cpp
 *
 *  Created on: Oct 23, 2013
 *      Author: Nathaniel Gallinger
 */

#include <iostream>
#include <ctime>
#include "SavingsAccount.h"
using std::cerr;
using std::cout;

double NathanielGallinger::SavingsAccount::annualInterestRate;

// Constructor
NathanielGallinger::SavingsAccount::SavingsAccount(double savingsBalance)
{
```

```
  // Check to make sure valid
  if(savingsBalance >= 0) {
    this->savingsBalance = savingsBalance;
  }
  else {
    cerr << "Constructor Error, input must be non-negative\n";
    this->savingsBalance = 0;
  }
}

// Mutator
void
NathanielGallinger::SavingsAccount::setAnnualInterestRate(double newAnnualInterestRate)
{
  // Check to make sure valid
  if(newAnnualInterestRate >= 0) {
    SavingsAccount::annualInterestRate = newAnnualInterestRate;
  }
  else {
    cerr << "Mutator Error, input must be non-negative\n";
    SavingsAccount::annualInterestRate = 0;
  }
}

// Apply Monthly Interest
void
NathanielGallinger::SavingsAccount::applyMonthlyInterest()
{
  const char months = 12;
  const char percentage = 100;
  this->savingsBalance += this->savingsBalance * (SavingsAccount::annualInterestRate /
                          (months * percentage));
}


/*
 * hw3.cpp
 *
 *  Created on: Oct 23, 2013
 *      Author: Nathaniel Gallinger
 */

#include "SavingsAccount.h"
#include <iostream>
using std::cout;
using NathanielGallinger::SavingsAccount;

int main()
{
  // Create SavingsAccount object
  cout << "Constructor with argument 1500: \n";
  SavingsAccount account1(1500);
  cout << "Interest rate 10%\n";
  account1.setAnnualInterestRate(10);
  account1.applyMonthlyInterest();
  cout << "Account Balance: " << account1.getSavingsBalance() << "\n";

  // Test error cases
  SavingsAccount account2(-5);
  account2.setAnnualInterestRate(-5);
```

```
}
```

```
Output:
Constructor with argument 1500:
Interest rate 10%
Account Balance: 1512.5
Constructor Error, input must be non-negative
Mutator Error, input must be non-negative
```