```cpp
//Calculator Project
//Allina Khan
//Homework #6
#include <iostream>
#include <cstdlib>
#include <fstream>
using namespace std;
//function prototypes
void menu();
void average(ifstream &, ofstream &);
void maximum(ifstream &, ofstream &);
void minimum(ifstream &, ofstream &);
void square(ifstream &, ofstream &);
void addition(ifstream &, ofstream &);
void subtract(ifstream &, ofstream &);
void multiply(ifstream &, ofstream &);
void divide(ifstream &, ofstream &);

/*Function menu()
Input:
    none
Process:
    Function prints the menu
    Then prompts user to make a selection
Output:
    Menu options and prompt for a selection.*/
void menu() {
    cout << "+ - * / or % \t usual arithmetic operators" << endl
    << "A \t\t Average of two #s " << endl
    << "X \t\t Maximum of two #s" << endl
    << "M \t\t Minimum of two #s" << endl
    << "S \t\t Square of a number" << endl
    << "Q \t\t Enter to quit program" << endl
    << "Select an operand for your math problem: " << endl << endl;
return; }
/*Function average();
Input: redirected cin and cout file
Process:
    initiates 3 integers x,y, average
    Prompts user and reads in variable x and y
    calculates average of x and y and stores in average
Output: Prints average of x and y.
*/
void average(ifstream &in1, ofstream &out1) {
    int x, y, average;
    cout << "Enter two integers to find average. "<<endl;
    in1 >> x >> y;
    average = (x+y)/2;
    out1 << "The average of " << x << " and " << y << " is "
    << average << endl << endl;
return;}

/*Function maximum();
Input: redirected cin and cout file
Process:
    Initiates two integers x and y.
    Prompts user and reads in two integers
    Nested if statement finds maximum of x and y
Output: Prints which number is the maximum or that they're equivalent
*/
void maximum(ifstream &in2, ofstream &out2) {
    int x, y;
    cout << "Enter two integers to find maximum. " << endl;
    in2 >> x >> y;
    if (x > y)
        out2 << x << " is the maximum of "<<x<<" and "<<y<< endl
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        << endl;
    else if (x < y)
        out2 << y << " is the maximum of "<<x<<" and "<<y<< endl
        << endl;
    else if (x == y)
        out2 << "The two numbers "<< x << ", " << y << " are equal."
        << endl<< endl;
return;}
/*Function minimum();
Input: redirected cin and cout file
Process:
    Initiates two integers x and y.
    Prompts user and reads in two integers
    Nested if statement finds minimum of x and y
Output: Prints which number is the minimum or that they're equivalent
*/
void minimum(ifstream &in3, ofstream &out3) {
    int x, y;
    cout << "Enter two integers to find minimum. " << endl;
    in3 >> x >> y;
    if (x > y)
        out3 << y << " is the minimum of "<<x<<" and "<<y<< endl<< endl;
    else if (x < y)
        out3 << x << " is the minimum of "<<x<<" and "<<y<< endl<< endl;
    else if (x == y)
       out3 << "The two numbers "<< x << ", " << y << " are equal."
       << endl<< endl;
return;}
/*Function maximum()
Input: redirected cin and cout file
Process:
    Initiates two integers x and square.
    Prompts user and reads in value for x
    Multiples value of x by itself and stores in square.
Output: Prints value x and it's square
*/
void square(ifstream &in4, ofstream &out4) {
    int x, square;
    cout << "Enter one integer. "<<endl;
    in4 >> x;
    square = x*x;
    out4 << "The square of "<< x <<" is " << square << endl<< endl;
return;}
/*Function addition()
Input: redirected cin and cout file
Process:
    Initiates integers x,y, and sum
    Prompts user and reads in values for x and y.
    Adds x and y and stores value in sum.
Output: Prints value of x, y, and sum.
*/
void addition(ifstream &in5, ofstream &out5) {
    int x, y, sum;
    cout << "Enter two integers to add. "<<endl;
    in5 >> x >> y;
    sum= x+y;
    out5 << "The sum of " << x << " + " << y << " is " << sum<< endl
    << endl;
return;}
/*Function subtract()
Input: redirected cin and cout file
Process:
    initiates integers x, y, and sub (Subtract)
    Prompts user and reads in values for x and y.
    Subtracts x by y and stores value in sub.
Output: Prints value of x, y, and sub.
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*/
void subtract(ifstream &in6, ofstream &out6) {
    int x, y, sub;
    cout << "Enter two integers to subtract. " << endl;
    in6 >> x >> y;
    sub= x-y;
    out6 << "The subtraction of " << x << " - " << y << " = " << sub
    <<endl<< endl;
return;}
/*Function multiply()
Input: redirected cin and cout file
Process:
    Initiates integers x, y, and mult (multiplication)
    Prompts user and reads in values for x and y.
    Multiplies x and y and stores value in mult.
Output: Prints x, y, and mult.
*/
void multiply(ifstream &in7, ofstream &out7) {
    int x, y, mult;
    cout << "Enter two integers to multiply. " <<endl;
    in7 >> x >> y;
    mult= x*y;
    out7 << "The multiplication of " << x << " * " << y << " = "
    << mult<< endl<< endl;
    return;}
/*Function divide()
Input: redirected cin and cout file
Process:
    Initiates integers x, t, and div. (Divide)
    Prompts user and reads in values for x and y.
    Divides x by y and stores value in div.
Output: Prints x, y, and div.
*/
void divide(ifstream &in8, ofstream &out8) {
    int x, y, div;
    cout << "Enter two integers to divide. " <<endl;
    in8 >> x >> y;
    div= x/y;
    out8 << "The division of " << x << " / " << y << " = "
    << div<< endl<< endl;
return;}
int main() {
    char operation;
    bool escape=true;       //will act as escape mechanism
    //redirecting files
    ifstream in("chap6in.txt");
    ofstream out("chap6out.txt");

    out << "Allina Khan\nProgram 6 Calculator \n\n";
    do {
        //Prints menu and prompts user for input
        menu();
        in >> operation;
        //evaluates user input with two numbers.
        switch(operation) {
            case 'a':
            case 'A':
                average(in,out);
                break;
            case 'x':
            case 'X':
                maximum(in,out);
                break;
            case 'm':
            case 'M':
                minimum(in,out);
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                break;
            case 's':
            case 'S':
                square(in,out);
                break;
            case '+':
                addition(in,out);
                break;
            case '-':
                subtract(in,out);
                break;
            case '*':
                multiply(in,out);
                break;
            case '/':
                divide(in,out);
                break;
            case 'q':
            case 'Q':
                cout << "You entered Q, now quitting program.";
                //escape so that while loop ends
                escape=false;
                break;
            default:
                cout <<"invalid choice" << endl;
                break;
        }
    }
    while (escape);
return 0; }
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