CSci 1113
Midterm 2

Name: _____

Student ID: _____

Instructions: Please pick and answer any 6 of the 7 problems for a total of 60 points. If you answer more than 6 problems, only the first 6 will be graded. The time limit is 50 minutes. Please write your answers in the space provided. The exam is open book and notes. You may use electronic devices to ONLY look at either an e-book version or electronic notes. You may not use the internet, compiler or any other outside resources. (If you are typing on your keyboard/input device for anything other than ctrl-F to find words in the e-book or notes, this is probably not acceptable.)

Problem (1) [10 points] Iacchus always works 30 hours a week. Iacchus's first job pays $16.50 an hour, the second job pays $18.20 an hour and the third job pays $14.19 an hour. Write a function (in C++) that takes in the amount of time Iacchus spends on the first and second job and return how much money Iacchus gained that week.

Problem (2) [10 points] Write a recursive function (in C++) that can find the average (i.e. mean) of any array. You **cannot use any loops**. At the minimum you need to input the array and the array's size.

Problem (3) [10 points] Write code that reads from "input.txt" and makes a file "sloppyCopy.txt". The file "sloppyCopy.txt" should be identical to the original file, except lines "a" and "b" are swapped (The first line in the file is "line 1"). Use "a" and "b" as integers which already have values in your code, and you can assume: $a < b$. You may also assume "input.txt" will contain at least "b" lines.

```
Example input.txt with a=3, b=5 (no initial blank lines):

Once upon a time, in a land far, far away...
There was a college student taking a test...
This ended up ruining their life.
The professor made the test hard...
... and they lived a happy life.


Corresponding sloppyCopy.txt:

Once upon a time, in a land far, far away...
There was a college student taking a test...
... and they lived a happy life.
The professor made the test hard...
This ended up ruining their life.
```

Problem (4) [10 points] Assume a file called "bdays.txt" has the format of: First_name date. You do not know how many entries are in this file, but write code that will print out the "First_name" of the oldest person. Below is a sample "bdays.txt" to clarify the formatting (date format is American: Month/Day/Year).

```
Siva 3/17/1984
Abhilasha 12/12/2012
Gocha 1/2/2003
Nedeljko 10/29/1999
```

Problem (5) [10 points] Write a "cut" function (in C++). This function should take as input two strings, one is the original string to be cut and the other are the words that you want cut. You must remove all the "to cut" parts from the original string, then return this modified string. If the "to cut" part never happens in the original string, you should just return the original string.
Note: you should only remove parts from the original string and not recurively from every generated string, see the example for clarification. You can also assume the "to cut" part will not overlap with itself, as in the case where: original="teeheehee", toCut="ehee".

```
original="IaateteMMate"
toCut="ate"

returned string="IateMM"
(as "ate" only directly appears twice in the original string)
```

Problem (6) [10 points] Write a function to fill in a calendar. The calendar will be a two-dimensional string array, with dimensions 7 by 7. Assume the string array is passed into your function with all elements as blank (i.e. the blank string). Your function should also take in two integers: how many days are in this month and an integer representing which day-of-the-week the first day of the month is on. The "first-day-of-the-week" integer has 0 representing starting on Sunday, 1 means the 1st day of the month is on Monday, 2 for Tuesday, ... and 6 for Saturday. You can assume a "string to_string(int)" function exists that will convert integers to strings.
Note: Standard American calendars start with Sunday on the left and have Saturday on the right.

Problem (7) [10 points] Find 3 possible places for errors in the following code (assume no issues with parts not shown, such as #include). Assume no user-defined global variables exist. Explain specifically what causes the error and whether it is a syntax, runtime or logic error.

```
int sumArray(int a[], int size);

int main() {
    int a={1,5,6,3,7,4};
    int sum = sumArray(a, 5);
    cout << "Sum is: " << sum << endl;
}

int sumArray(int a[], int size) {
    if(size == 0) {
        return size;
    }
    else {
        a[size-1] + sumArray(a, size--);
    }
    int dummy = 8;
}
```