```
 1 ************************************************************
 2 * PROGRAMMED BY : Negin Mashhadi & Travis Nguyen
 3 * STUDENT ID    : 1084104 & 1035825
 4 * CLASS         : CS1B - MW - 6:30pm
 5 * LAB #2        : Function- Coin Flip
 6 ************************************************************
 7
 8
 9 What is your name?         Ed Peck
10 What is your gender (M/F): M
11
12 Try to get 3 heads in a row. Good luck Mr. Ed Peck!
13
14 Press <enter> to flip
15 TAIL
16 Press <enter> to flip
17 HEAD
18 Press <enter> to flip
19 HEAD
20 Press <enter> to flip
21 HEAD
22 Press <enter> to flip
23
24 It took you 4 tosses to get 3 heads in a row.
25 On average you flipped heads 75% of the time
26
27
28 ************************************************************
29 * PROGRAMMED BY : Negin Mashhadi & Travis Nguyen
30 * STUDENT ID    : 1084104 & 1035825
31 * CLASS         : CS1B - MW - 6:30pm
32 * LAB #2        : Function- Coin Flip
33 ************************************************************
34
35
36 What is your name?         Negin Mashhadi
37 What is your gender (M/F): F
38
39 Try to get 3 heads in a row. Good luck Ms. Negin Mashhadi!
40
41 Press <enter> to flip
42 HEAD
43 Press <enter> to flip
44 HEAD
45 Press <enter> to flip
46 HEAD
47 Press <enter> to flip
48
49 It took you 3 tosses to get 3 heads in a row.
50 On average you flipped heads 100% of the time
51
52
53 ************************************************************
54 * PROGRAMMED BY : Negin Mashhadi & Travis Nguyen
55 * STUDENT ID    : 1084104 & 1035825
56 * CLASS         : CS1B - MW - 6:30pm
57 * LAB #2        : Function- Coin Flip
```

```
58 ************************************************************
59
60
61 What is your name?         Travis Nguyen
62 What is your gender (M/F): M
63
64 Try to get 3 heads in a row. Good luck Mr. Travis Nguyen!
65
66 Press <enter> to flip
67 HEAD
68 Press <enter> to flip
69 HEAD
70 Press <enter> to flip
71 TAIL
72 Press <enter> to flip
73 TAIL
74 Press <enter> to flip
75 TAIL
76 Press <enter> to flip
77 TAIL
78 Press <enter> to flip
79 TAIL
80 Press <enter> to flip
81 TAIL
82 Press <enter> to flip
83 TAIL
84 Press <enter> to flip
85 TAIL
86 Press <enter> to flip
87 TAIL
88 Press <enter> to flip
89 HEAD
90 Press <enter> to flip
91 HEAD
92 Press <enter> to flip
93 HEAD
94 Press <enter> to flip
95
96 It took you 14 tosses to get 3 heads in a row.
97 On average you flipped heads 36% of the time
```

```
#ifndef LAB2HEADERFILE_H_
#define LAB2HEADERFILE_H_

#include <ostream>
#include <iostream>
#include <iomanip>
#include <string>
#include<stdlib.h>
#include<time.h>
using namespace std;

/*****************************************************************************
* PrintHeader
*   This function receives an assignment name, type and number then outputs
*   the appropriate header
*    ==> returns nothing - This will output the class heading.
*****************************************************************************/
void PrintHeader (ostream   &output,// IN/OUT - output file
                  string    asName, // IN     - assignment Name - used for output
                  char      asType, // IN     - assignment Type
                                    //        - (LAB or ASSIGN) - used for output
                  int       asNum); // IN     - assignment Name - used for output

/*****************************************************************************
 * getInput
 *      This function will ask the use to input their information (their name
 *  and gender). If the user is male The program will refre to them as mister
 *  and if the use is female the program will refer to them as miss.
 *      ==> returns nothing
 *****************************************************************************/
void GetInput();
/*****************************************************************************
 * CoinFlip
 *      This function will flip a coin and randomly choose between head or
 *  tails. Every time the user enters enter on the keyboard the function will
 *  flip the coin
 *      ==> return a bool(if heads true, if tails false)
 *****************************************************************************/
bool CoinFlip();
/*****************************************************************************
 *  CoinAvg
 *      This function will calculate the average amount of times a head has been
 *  shown when the coin was flipped.
 *      ==> returns the average number of heads
 *****************************************************************************/
float CoinAvg(int fTotalFlips,      // IN - The total number of flips
              int   fTotalHeads);     // IN - The total number of heads
/*****************************************************************************
 *  PrintOutput
 *      This will output the number of tosses of heads and average number of
 *  heads.
 *      ==> returns nothing
 *****************************************************************************/
void PrintOutput(float fAvg,            // IN - The average number of heads
                 int fTotalFlips);      // IN - The total number of flips
#endif /* LAB2HEADERFILE_H_ */

```

```cpp
/*******************************************************************************
 * AURHOR           :   Negin Mashhadi & Travis Nguyen
 * STUDENT ID       :   1084104 & 1035825
 * LAB#2            :   Coin flip
 * CLASS            :   CS1B
 * SECTION          :   MW - 6:30pm - 9:50pm
 * DUE DATE         :   1/31/2018
 * ******************************************************************************/
#include "lab2HeaderFile.h"

/*******************************************************************************
 * Coin Flip
 * ------------------------------------------------------------------------------
 *  This program will ask the user to input their name and gender. Then the
 *  program will ask the user to press enter to flip a coin and the program
 *  will continue until flipping a coin repeatedly and continues until three
 *  consecutive heads are tossed. At that point the total number of coin flips
 *  that were made and the average number of heads.
 *  ------------------------------------------------------------------------------
 *  INPUT
 *          Name    : The name of the user
 *          gender  : The gender of the user
 *  OUTPUT
 *          The number of times the coin is flipped and the number of times
 *          a head has been tossed. The program will also output the average
 *          amount of times a head has been tossed.
 *******************************************************************************/
int main()
{
/*******************************************************************************
 * CONSTANTS
 * ------------------------------------------------------------------------------
 * PROCESSING - the following is used for the size of the arrays used in this
 * program
 * ------------------------------------------------------------------------------
 *  NOTHING
 *******************************************************************************/

    int headCount;          // CALC - The number of heads tossed
    int totalHeadCount;     // CALC - The total number of heads tossed
    int totalFlips;         // CALC - The total number of coin flips
    float avg;              // CALC - The average number of heads tossed
    bool coinChoice;        // CALC - The random choice of coin

    /*INTIALIZING*/
    headCount = 0;
    totalHeadCount = 0;
    totalFlips = 0;

    PrintHeader(cout, "Function- Coin Flip", 'L', 2);

    /*******************************************************************************
     * INPUT - The user will input their name and gender
     *******************************************************************************/
    GetInput();
    /*******************************************************************************
     * PROCESSING - The process for flipping the coin
```

```
58      *****************************************************************/
59      coinChoice = CoinFlip();
60
61      while(headCount != 3)
62      {
63          totalFlips++;
64          if(coinChoice)
65          {
66              cout << "HEAD\n";
67              totalHeadCount++;
68              headCount++;
69          }
70          else
71          {
72              cout << "TAIL\n";
73              headCount=0;
74          }
75          coinChoice = CoinFlip();
76
77      }
78
79      avg = CoinAvg(totalFlips, totalHeadCount);
80      /*****************************************************************
81       * OUTPUT - The total number of flips and average number of flips
82       *****************************************************************/
83      PrintOutput(avg, totalFlips);
84
85      return 0;
86  }
87
```

```cpp
/*****************************************************************************
 * AURHOR           :   Negin Mashhadi & Travis Nguyen
 * STUDENT ID       :   1084104 & 1035825
 * LAB#2            :   Coin flip
 * CLASS            :   CS1B
 * SECTION          :   MW - 6:30pm - 9:50pm
 * DUE DATE         :   1/31/2018
 * ***************************************************************************/
#include "lab2HeaderFile.h"

/*****************************************************************************
 * Get Input
 * ---------------------------------------------------------------------------
 *      This function will ask the use to input their information (their name
 *  and gender). If the user is male The program will refre to them as mister
 *  and if the use is female the program will refer to them as miss.
 *      ==> returns
 * ---------------------------------------------------------------------------
 *  PRE-CONDITIONS
 *          <Nothing>
 *  POST-CONDITIONS
 *          ==> returns nothing
 *****************************************************************************/
void GetInput()
{
/*****************************************************************************
 * CONSTANTS
 * ---------------------------------------------------------------------------
 * PROCESSING - the following is used for the size of the arrays used in this
 * program
 * ---------------------------------------------------------------------------
 *  PROMPT_COL  : Column size for the prompt
 *****************************************************************************/
    const int PROMPT_COL = 27;

    string name;            // IN           - The name of the user
    char gender;            // IN           - The gender of the user
    string genderPrefix;    // CALC & OUT   - What the program will refer the
                            //                usesr as

    cout << left;
    cout << setw(PROMPT_COL) << "What is your name?";
    getline(cin, name);
    cout << left;
    cout << setw(PROMPT_COL) << "What is your gender (M/F):";
    cin.get(gender);
    gender = toupper(gender);
    cin.ignore(1000, '\n');

    if(gender == 'M')
    {
        genderPrefix = "Mr. ";
    }
    else
    {
        genderPrefix = "Ms. ";
    }
```

```
58
59      cout << "\nTry to get 3 heads in a row. Good luck " << genderPrefix
60           << name << "!\n\n";
61  }
62
63
```

```cpp
/*****************************************************************************
 * AURHOR           :   Negin Mashhadi & Travis Nguyen
 * STUDENT ID       :   1084104 & 1035825
 * LAB#2            :   Coin flip
 * CLASS            :   CS1B
 * SECTION          :   MW - 6:30pm - 9:50pm
 * DUE DATE         :   1/31/2018
 * ***************************************************************************/
#include "lab2HeaderFile.h"

/*****************************************************************************
 * Coin Flip
 * ---------------------------------------------------------------------------
 *      This function will flip a coin and randomly choose between head or
 *  tails. Every time the user enters enter on the keyboard the function will
 *  flip the coin
 *      ==> return a bool(if heads true, if tails false)
 * ---------------------------------------------------------------------------
 *  PRE-CONDITIONS
 *              <NOTHING>
 *  POST-CONDITIONS
 *          ==> return a bool(if heads true, if tails false)
 *****************************************************************************/
bool CoinFlip()
{

    int randomVal;          // CALC - The random coin flip
    bool flipValue;         // CALC - bool value of coin flip


    cout << "Press <enter> to flip";
    cin.ignore(1000, '\n');


    srand(time(NULL));
    randomVal = rand()%2;

    if(randomVal == 1)
    {
        flipValue = true;
    }
    else
    {
        flipValue = false;
    }

    return flipValue;
}

```

```cpp
/*****************************************************************************
 * AURHOR           :   Negin Mashhadi & Travis Nguyen
 * STUDENT ID       :   1084104 & 1035825
 * LAB#2            :   Coin flip
 * CLASS            :   CS1B
 * SECTION          :   MW - 6:30pm - 9:50pm
 * DUE DATE         :   1/31/2018
 * ***************************************************************************/
#include "lab2HeaderFile.h"

/*****************************************************************************
 * CoinAvg
 * ---------------------------------------------------------------------------
 *      This function will calculate the average amount of heads the user
 *   has recieved in results of fliping the coin.
 * ---------------------------------------------------------------------------
 *  PRE-CONDITIONS
 *          fTotalFlips : The total number of flips
 *          fTotalHeads : The total number of heads
 *  POST-CONDITIONS
 *          ==> returns the average number of heads
 *****************************************************************************/
float CoinAvg(int fTotalFlips,      // IN - The total number of flips
              int   fTotalHeads)    // IN - The total number of heads
{
    float avg;          // CALC - The average amount of heads flipped
    cout << setprecision(0) << fixed;
    avg = (double(fTotalHeads)/fTotalFlips) * 100;

    return avg;
}

```

```cpp
/*****************************************************************************
 * AURHOR           :   Negin Mashhadi & Travis Nguyen
 * STUDENT ID       :   1084104 & 1035825
 * LAB#2            :   Coin flip
 * CLASS            :   CS1B
 * SECTION          :   MW - 6:30pm - 9:50pm
 * DUE DATE         :   1/31/2018
 * ***************************************************************************/
#include "lab2HeaderFile.h"

/*****************************************************************************
 * PrintOutput
 * ---------------------------------------------------------------------------
 *  This will output the number of tosses of heads and average number of
 *  heads.
 *      ==> returns nothing
 * ---------------------------------------------------------------------------
 *  PRE-CONDITIONS
 *          fAvg        : The average number of heads
 *          fTotalFlips : The total number of flips
 *  POST-CONDITIONS
 *          ==> returns nothing
 *****************************************************************************/
void PrintOutput(float fAvg,        // IN - The average number of heads
                 int fTotalFlips)   // IN - The total number of flips
{
    cout << "\nIt took you " << fTotalFlips << " tosses to get 3 heads in a "
                                                "row.";
    cout << "\nOn average you flipped heads " << fAvg << "% of the time";
}

```

```cpp
/*****************************************************************************
 * AURHOR           :   Negin Mashhadi
 * STUDENT ID       :   1084104
 * ASSIGNMENT#1     :   Functions and Arrays
 * CLASS            :   CS1B
 * SECTION          :   MW - 6:30pm - 9:50pm
 * DUE DATE         :   1/29/2018
 * ***************************************************************************/

#include <string>
#include <iostream>
#include <iomanip>      /**setw**/
#include <fstream>      /**output**/
#include <ostream>
using namespace std;

/*****************************************************************************
 * FUNCTION printHeader
 * ---------------------------------------------------------------------------
 *  This function receives an assignment name, type and number then outputs the
 *      appropriate class heading.
 * ==> returns nothing - this function output the class heading.
 * ---------------------------------------------------------------------------
 * PRE-CONDITIONS
 *          the following need a defined value pass in
 *          output  : The output file
 *          asName: Assignment Name
 *          asType: Assignment Type
 *          asNum : Assignment Number
 *
 * POST-CONDITIONS
 *      ==> Returns nothing - this function output the class heading.
 *****************************************************************************/

void PrintHeader (ostream   &output,// IN/OUT - output file
                  string    asName, // IN     - assignment Name - used for output
                  char      asType, // IN     - assignment Type
                                    //        - (LAB or ASSIGN) - used for output
                  int       asNum)  // IN     - assignment Name - used for output

{
    output << left;
    output << "*************************************************************\n";
    output << "* PROGRAMMED BY : Negin Mashhadi & Travis Nguyen\n";
    output << "* "    << setw(14) << "STUDENT ID" << ": 1084104 & 1035825\n";
    output << "* "      << setw(14) << "CLASS"      << ": CS1B - MW - 6:30pm\n";
    output << "* ";

    //PROCESSING - This will adjust setws and format appropriately based on if
    //              this is a lab 'L' or assignment

    if (toupper(asType) == 'L')
    {
        output << "LAB #" << setw(9);
    }
    else
    {
```

```
58          output << "ASSIGNMENT #" << setw(2);
59      }
60
61      output << asNum << ": " << asName << endl;
62      output << "************************************************************\n\n";
63      output << right<< endl;
64
65  }
66
```