

```
1 TEST 1:
2 *****
3 * PROGRAMMED BY : Andrew Gharios
4 * CLASS          : CS1B
5 * SECTION        : M-TH 5-7:20p
6 * LAB #2         : Functions - Coin Flip
7 *****
8
9 Welcome to coin toss! Get 3 heads in a row to win!
10
11 What is your name?      Ed Peck
12 What is your gender(m/f)? M
13
14 Try to get 3 heads in a row. Good luck Mr. Ed Peck!
15
16 Press <enter> to flip
17 TAIL
18 Press <enter> to flip
19 HEAD
20 Press <enter> to flip
21 TAIL
22 Press <enter> to flip
23 TAIL
24 Press <enter> to flip
25 TAIL
26 Press <enter> to flip
27 HEAD
28 Press <enter> to flip
29 HEAD
30 Press <enter> to flip
31 HEAD
32
33 It took you 8 to get 3 heads in a row.
34 On average you flipped heads 50% of the time.
35
36 TEST 2:
37 *****
38 * PROGRAMMED BY : Andrew Gharios
39 * CLASS          : CS1B
40 * SECTION        : M-TH 5-7:20p
41 * LAB #2         : Functions - Coin Flip
42 *****
43
44 Welcome to coin toss! Get 3 heads in a row to win!
45
46 What is your name?      Drew Roberts
47 What is your gender(m/f)? M
48
49 Try to get 3 heads in a row. Good luck Mr. Drew Roberts!
50
51 Press <enter> to flip
52 TAIL
53 Press <enter> to flip
```

```
54 HEAD
55 Press <enter> to flip
56 TAIL
57 Press <enter> to flip
58 HEAD
59 Press <enter> to flip
60 TAIL
61 Press <enter> to flip
62 HEAD
63 Press <enter> to flip
64 HEAD
65 Press <enter> to flip
66 HEAD
67
68 It took you 8 to get 3 heads in a row.
69 On average you flipped heads 62.5% of the time.
70
71 TEST 3:
72 *****
73 * PROGRAMMED BY : Andrew Gharios
74 * CLASS          : CS1B
75 * SECTION        : M-TH 5-7:20p
76 * LAB #2         : Functions - Coin Flip
77 *****
78
79 Welcome to coin toss! Get 3 heads in a row to win!
80
81 What is your name?      Sophie Clair
82 What is your gender(m/f)? F
83
84 Try to get 3 heads in a row. Good luck Miss Sophie Clair!
85
86 Press <enter> to flip
87 TAIL
88 Press <enter> to flip
89 HEAD
90 Press <enter> to flip
91 TAIL
92 Press <enter> to flip
93 TAIL
94 Press <enter> to flip
95 HEAD
96 Press <enter> to flip
97 HEAD
98 Press <enter> to flip
99 TAIL
100 Press <enter> to flip
101 TAIL
102 Press <enter> to flip
103 HEAD
104 Press <enter> to flip
105 HEAD
106 Press <enter> to flip
```

107 HEAD

108

109 It took you 11 to get 3 heads in a row.

110 On average you flipped heads 54.5455% of the time.

111

112

```
1 /
   *****
2 * AUTHOR : Andrew Gharos
3 * STUDENT ID : 1449366
4 * LAB #2      : CS1A Review - Theme Park Day
5 * CLASS       : CS1B
6 * SECTION     : MTWTH: 5pm
7 * DUE DATE    : 6/9/21
8 *****
   ****/
9 #include <iostream>
10 #include <iomanip>
11 #include <string>
12 #include <stdlib.h>
13 #include <time.h>
14 using namespace std;
15
16 /
   *****
17 * User Input
18 * This function receives will read in the user input of their name and
   gender
19 * and then pass it back by reference.
20 * ==> returns gender and name by reference from user input.
21 *
22 *****
   ****/
23 void UserInput(string& name, // IN & OUT - User name.
24                char& gender); // IN & OUT - User's gender.
25
26 /
   *****
27 * Coin Flip
28 * This function will generate a random number from the range 0-1, which
   will
29 * be used to simulate a coinflip.
30 * ==> returns a random number from 0 to 1.
31 *
32 *****
   ****/
33 bool CoinFlip();
34
35 /
   *****
36 * Average Percent
37 * This function receive two integers, which are used to calculate a
   certain
```

```
38  *   average.
39  *   ==> returns average of the two integers inputted.
40  *
41  ****/
42  float AveragePercent(int sum,    // IN & CALC - Sum selected by user.
43                      int total); // IN & CALC - Total number to divide by.
44
45  /
46  * Output Results
47  *   This function will output the results of the game at the end.
48  *   ==> returns nothing.
49  *
50  ****/
51  void OutputResults(float averageHeads, // IN - Average times heads was
52                    int totalFlips);    // IN - Total times coin was
53                                       flipped.
54
55  int main()
56  {
57      /
58      * CONSTANTS
59      *
60      * OUTPUT - USED FOR CLASS HEADING
61      *
62      * PROGRAMMER      : Programmer's Name
63      * CLASS           : Student's Course
64      * SECTION         : Class Days and Times
65      * LAB_NUM         : Lab Number (specific to this lab)
66      * LAB_NAME        : Title of the Lab
67
68      * STRN_SIZE       : String size for variables.
69
70      const char PROGRAMMER[] = "Andrew Gharrios";
71      const char CLASS[]      = "CS1B";
72      const char SECTION[]    = "M-TH 5-7:20p";
73      const int  LAB_NUM      = 2;
```

```
74     const char LAB_NAME[] = "Functions - Coin Flip";
75
76     const int STRN_SIZE= 50;
77
78     string genderMsg;
79     string name;
80     char gender;
81     int totalHeads;
82     int totalFlips;
83     int headsInRow;
84     bool coinFlip;
85     float averageHeads;
86
87     srand(time(NULL));
88
89     totalHeads = 0;
90     totalFlips = 0;
91     headsInRow = 0;
92
93     cout << left;
94     cout << "*****\n";
95     cout << "* PROGRAMMED BY : " << PROGRAMMER << endl;
96     cout << "* " << setw(14) << "CLASS" << ": " << CLASS << endl;
97     cout << "* " << setw(14) << "SECTION" << ": " << SECTION << endl;
98     cout << "* LAB #" << setw(9) << LAB_NUM << ": " << LAB_NAME << endl;
99     cout << "*****\n\n";
100    cout << right;
101
102    cout << "Welcome to coin toss! Get 3 heads in a row to win!";
103    cout << endl << endl;
104
105    UserInput(name, gender);
106
107    if (gender == 'M')
108    {
109        genderMsg = "Mr. ";
110    }
111    else
112    {
113        genderMsg = "Miss ";
114    }
115
116    cout << endl;
117    cout << "Try to get 3 heads in a row. Good luck " << genderMsg << name <<
        << "!";
118    cout << endl << endl;
119
120    while (headsInRow != 3)
121    {
122        cout << "Press <enter> to flip";
123        cin.ignore();
124
125        coinFlip = CoinFlip();
```

```

126     if (coinFlip == 1)
127     {
128         cout << "TAIL" << endl;
129         totalFlips += 1;
130         headsInRow = 0;
131     }
132     else
133     {
134         cout << "HEAD" << endl;
135         totalFlips += 1;
136         headsInRow += 1;
137         totalHeads += 1;
138     }
139 }
140
141 averageHeads = AveragePercent(totalHeads, totalFlips);
142 OutputResults(averageHeads, totalFlips);
143
144 return 0;
145 }
146 }
147
148 /
149 * User Input
150 * This function receives will read in the user input of their name and
151 * gender
152 * and then pass it back by reference.
153
154 * INPUTS:
155 * name: user's name.
156 * gender: user's gender.
157 *
158 void UserInput(string& name, // IN & OUT - User name.
159               char& gender) // IN & OUT - User's gender.
160 {
161     const int INPUT_COL = 26;
162
163     cout << left;
164     cout << setw(INPUT_COL) << "What is your name?";
165     getline(cin, name);
166
167     cout << setw(INPUT_COL) << "What is your gender(m/f)?";
168     cin >> gender;
169     cin.ignore(10000, '\n');
170
171     cout << right;

```

```

172 }
173
174 /
    *****
    *****
175 * Coin Flip
176 * This function will generate a random number from the range 0-1, which
    will
177 * be used to simulate a coinflip.
178 *
179 * -NO INPUTS.
180 *
181 * OUTPUTS:
182 * bool: returns if the number was 1 or 0.
183
    *****
    ***/
184 bool CoinFlip()
185 {
186     int randomValue = rand() % 2;
187     if (randomValue == 1)
188     {
189         return true;
190     }
191     else
192     {
193         return false;
194     }
195 }
196
197 /
    *****
    *****
198 * Average Percent
199 * This function receive two integers, which are used to calculate a
    certain
200 * average.
201
    *****
    ***
202 * INPUTS:
203 * sum: Sum of head flips.
204 * total: total flips.
205 *
206 * OUTPUTS:
207 * average: average of heads flipped.
208
    *****
    ***/
209 float AveragePercent(int sum, // IN & CALC - Sum selected by user.
210                     int total) // IN & CALC - Total number to divide by.
211 {
212     float num1;

```



```
213     num1 = (float(sum) / total ) * 100;
214     return num1;
215 }
216
217 /
    *****
    *****
218 * Output Results
219 * This function will output the results of the game at the end.
220
    *****
    ***
221 * INPUTS:
222 * averageHeads: Average heads flipped.
223 * totalFlips: Total flips in the game.
224
    *****
    ***/
225 void OutputResults(float averageHeads, // IN - Average times heads was
    flipped.
226                     int totalFlips)    // IN - Total times coin was
    flipped.
227 {
228     cout << endl;
229     cout << "It took you " << totalFlips << " to get 3 heads in a row.";
230     cout << endl;
231     cout << "On average you flipped heads " << averageHeads << "% of the
    time.";
232 }
233
234
```