

```
1 *****
2 * PROGRAMMED BY : Blake Allard
3 * CLASS : CS1A
4 * SECTION : M/W 8am
5 * EXR #19b : Buddy's Farm Census
6 *****
7
8 Welcome to Buddy's Farm Census!
9
10 What is your name?: Blake
11
12
13 Please enter a sheep's age: 9
14
15
16 Please enter a person's age: 90
17
18
19 9 is a valid age!
20 Bahhh!
21
22 90 is a valid human age!
23 Congratulations, this person is alive!
24
25
26
27 Please enter a sheep's age: 14
28
29 INVALID! Please enter a sheep age between: 0 and 9
30
31
32 Please enter a sheep's age: -5
33
34 INVALID! Please enter a sheep age between: 0 and 9
35
36
37 Please enter a sheep's age: 3
38
39
40 Please enter a person's age: TTPP
41
42 INVALID! MUST BE A NUMBER!
43
44
45 Please enter a person's age: 500
46
47 INVALID! Please enter a human age between: 0 and 110
```

```
48
49
50 Please enter a person's age: 5
51
52
53 3 is a valid age!
54 Bahhh!
55
56 5 is a valid human age!
57 Congratulations, this person is alive!
58
59
60
61 Please enter a sheep's age: T;;;qpq
62
63 INVALID! MUST BE A NUMBER!
64
65
66 Please enter a sheep's age: 7
67
68
69 Please enter a person's age: 71
70
71
72 7 is a valid age!
73 Bahhh!
74
75 71 is a valid human age!
76 Congratulations, this person is alive!
77
78
79
80 Thank you for your help Blake!
81
82 The average age of sheep is: 6.33
83 The average age of people is: 55.33
84
85 Thank you for coming to Buddy's Farm! :)
86
87 Goodbye!!
```

```
1 #include <iostream>
2 #include <iomanip>
3 #include <string>
4 using namespace std;
5
6 /*****
7  * FUNCTION DESCRIPTION
8  * -----
9  * This program will obtain a number from the user and error check it for
10 * characters, then it will validate the number to check if its
11 * within a minimum - maximum range, finally it will return the number input
12 * once it has been validated
13 *****/
14
15 int ValidateIntInput(int minValue, int maxValue, string prompt1, string prompt2)
16 {
17     int    intInput;
18     bool    invalidInput;
19
20     invalidInput = true;
21
22     do
23     {
24         cout << prompt1;
25
26         if (!(cin >> intInput))
27         {
28             cin.clear();
29
30             cout << "\nINVALID! MUST BE A NUMBER!\n";
31         }
32
33         else if (intInput < minValue || intInput > maxValue)
34         {
35             cout << prompt2;
36             cout << minValue << " and " << maxValue << endl;
37         }
38
39         else
40         {
41             invalidInput = false;
42         }
43         cin.ignore(10000, '\n');
44     }while(invalidInput);
45
46
47
```

function.cpp

Tuesday, November 12, 2024, 2:55 AM

```
48
49     return intInput;
50 }
51
```

```
1 #include <iostream>
2 #include <iomanip>
3 #include <string>
4 using namespace std;
5
6 /*****
7  *   FUNCTION DESCRIPTION
8  *   -----
9  *   This program will process two numbers, divide num1 by num2, then it will
10  *   return the calculated average of the two numbers
11  *****/
12
13 double CalculateAverage(int num1 , int num2)
14 {
15     double avg;
16
17     avg = double(num1) / double(num2);
18
19     return avg;
20 }
21
```

```

1 #include <iostream>
2 #include <iomanip>
3 #include <string>
4 using namespace std;
5
6 /*****
7  * PROGRAM DESCRIPTION
8  * -----
9  * This program will obtain sheep ages and human ages as input and process/
10 * output the average age of sheep & humans
11 * -----
12 * INPUT:
13 *          - name
14 *          - sheepAge
15 *          - humanAge
16 * -----
17 * OUTPUT (IN LOOP):          - sheepAge
18 *                          - humanAge
19 *
20 * OUTPUT (OUT OF LOOP):
21 *          - name
22 *          - averageSheepAge
23 *          - averageHumanAge
24 * -----
25 * CALCULATING (IN LOOP):
26 *          - ValidateIntInput
27 *          - sheepCount
28 *          - humanCount
29 *          - totalSheepAge
30 *          - totalHumanAge
31 *
32 * CALCULATING (OUT OF LOOP):
33 *          - sheepAgeAvg
34 *          - humanAgeAvg
35 *          - CalculateAverage(num1 , num2)
36 *****/
37
38 /*****
39  * FUNCTION PROTOTYPES
40  *****/
41
42 //INPUT & CALC - validates & error checks sheep/human age
43 int ValidateIntInput(int minValue, int maxValue, string prompt1,
44                     string prompt2);
45
46 //CALC & OUTPUT - calculates the average age of sheep & humans
47 double CalculateAverage(int num1 , int num2);

```

```
48
49
50 int main()
51 {
52
53     /*****
54     * CONSTANTS
55     * -----
56     * CALCULATING - USED FOR ERROR CHECKING SHEEP & HUMAN AGES
57     * -----
58     * INVALID_SHEEP_AGE_MIN : Minimum valid sheep age
59     * INVALID_SHEEP_AGE_MAX : Maximum valid sheep age
60     * INVALID_HUMAN_AGE_MIN : Minimum valid human age
61     * INVALID_HUMAN_AGE_MAX : Maximum valid human age
62     * -----
63     * CALCULATING - USED FOR SETTING THE NUMBER OF PROGRAM CYCLES
64     * -----
65     * MAX_TESTS: Maximum amount of test cycles ran
66     *****/
67
68     const int INVALID_SHEEP_AGE_MIN = 0;
69     const int INVALID_SHEEP_AGE_MAX = 9;
70     const int INVALID_HUMAN_AGE_MIN = 0;
71     const int INVALID_HUMAN_AGE_MAX = 110;
72
73     const int MAX_TESTS = 3;
74
75     /*****
76     * INITIALIZATIONS
77     *****/
78
79     int    sheepCount    = 0;
80     int    humanCount    = 0;
81     int    totalHumanAge = 0;
82     int    totalSheepAge = 0;
83
84     /*****
85     * VARIABLES
86     *****/
87
88     int    caseRuns;
89     string name;
90     int    sheepAge;
91     int    humanAge;
92     double humanAgeAvg;
93     double sheepAgeAvg;
94
```

```
95
96 //INPUT - user inputs their name
97 cout << "Welcome to Buddy's Farm Census!\n\nWhat is your name?: ";
98 getline(cin, name);
99
100 cout << endl;
101
102 //INITIALIZE - initialize, check & change for loop runs
103 for (caseRuns = 1; caseRuns <= MAX_TESTS; ++caseRuns)
104 {
105
106 /*****
107  * INPUT - prompt the user to enter a sheep age & a human age
108  * -----
109  * EXAMPLE:
110  *         Please enter a sheep's age: 5
111  *         Please enter a person's age: 90
112 *****/
113
114
115     sheepAge = ValidateIntInput(INVALID_SHEEP_AGE_MIN, INVALID_SHEEP_AGE_MAX,
116                                "\nPlease enter a sheep's age: " ,
117                                "\nINVALID! Please enter a sheep age between: ");
118
119
120     humanAge = ValidateIntInput(INVALID_HUMAN_AGE_MIN, INVALID_HUMAN_AGE_MAX,
121                                "\nPlease enter a person's age: " ,
122                                "\nINVALID! Please enter a human age between: ");
123
124
125
126 //OUTPUT - output sheep age & human age per for loop run
127 cout << sheepAge << " is a valid age! \t\nBahhh!\n\n";
128 cout << humanAge << " is a valid human age! \t\nCongratulations, "
129                      "this person is alive!\n\n";
130
131
132 /*****
133  * CALCULATING - calculate the total ages & average of humans & sheep
134 *****/
135
136     ++sheepCount;
137     ++humanCount;
138
139     totalHumanAge += humanAge;
140     totalSheepAge += sheepAge;
141
```



```
142     } //... end for loop
143
144
145     sheepAgeAvg = CalculateAverage(totalSheepAge , sheepCount);
146     humanAgeAvg = CalculateAverage(totalHumanAge , humanCount);
147
148
149     /*****
150     * OUTPUT - output the user's name, average sheep age & average human age
151     *****/
152
153
154     //FORMATTING - format decimal output
155     cout << setprecision(2) << fixed;
156
157     cout << endl << endl;
158
159     cout << "Thank you for your help " << name << "!\n\n";
160     cout << "The average age of sheep is: " << sheepAgeAvg << endl;
161     cout << "The average age of people is: " << humanAgeAvg << endl << endl;
162     cout << "Thank you for coming to Buddy's Farm! :)\n\n Goodbye!!";
163
164     //FORMATTING - reset decimal formatting
165     cout << setprecision(6);
166     cout.unsetf(ios::fixed);
167
168
169     return 0;
170
171 }
172
```

```
void GetInput(char name, int numRounds);  
char GetAndCheckPlay();  
char GetComputerPlay();  
bool CheckWin(char userPlay, pcPlay);  
void OutputWin(char name, bool winCondition);  
void OutputMatchWinner(char name, int userWins, int pcWins );  
  
int userWins = 0;  
int pcWins = 0;  
int numRounds = 0;
```

```
int main()
```

```
{
```

```
    char name[25];  
    int numRounds;  
    char userPlayChoice[10];  
    char pcPlayChoice[10];  
    bool userWon;
```

```
    srand(time(1));
```

```
    GetInput(name, numRounds);
```

```
    while(userPlayChoice != 'x')
```

```
    {
```

```
        ++numRounds
```

GetInput(name, numRounds);

GetAndCheckPlay(playChoice,);

playChoice = GetComputerPlay();

winCondition = CheckWin(userPlayChoice, pcPlayChoice);