# Exercise 1: HiLo

Write a program that picks a random number from 1 to 100 and prompts the user to guess it. With each guess print “higher” or “lower” allowing the user to hone in on the value.

### Suggestions:

1. Start with a main that prints “Hello World”.
2. Add variables “myNumber” and “myGuess” at the top of the program. Give them test values.
3. Add the logic to compare the two variables and print the outcome
4. Add “cin” to input “myGuess”
5. Put the logic in a loop until the guess is correct
6. Make the “myNumber” random
7. Add a “guess counter” to tell the player how many guesses were made
8. Spruce up the game messages
9. Add some random wording for “higher” and “lower”
10. Add a “do you want to play again” loop

# Exercise 2: Stats

Write a main that reads integers from cin and passes them one by one to various functions that gather statistics on the growing list. A value of “0” should end the list. Then main should report all the statistics.

Define each statistic processor in its own namespace. Each should have a “process” function to receive the input and a “report” function to print the results. The “min” statistic processor and a stub main are shown below.

You add statistics for:

* even Count the number of even inputs
* odd Count the number of odd inputs
* fortyTwo Count the number of forty-twos
* sum Sum all the numbers
* average Average all the numbers

*min.h*

namespace min {

void process(int value);

void report();

}

*min.cpp*

namespace min {

int minValue = INT\_MAX;

void process(int value) {

if(value<minValue) {

minValue = value;

}

}

void report() {

cout << "Minimum value is " << minValue << endl;

}

}

int main() {

min::process(1);

min::process(2);

min::process(3);

min::report();

}

## Solutions

### Lab 1

#include <iostream>

#include <time.h>

using namespace std;

int main() {

char playAgain = 'y';

while(playAgain=='y' || playAgain=='Y') {

cout << "I am thinking of a number from 1 to 100. You guess it!" << endl;

srand(time(0));

int myNumber = rand();

myNumber = myNumber % 100;

myNumber = myNumber + 1;

int myGuess = 0;

int guessCount = 0;

while(myNumber!=myGuess) {

cout << "Your guess: ";

cin >> myGuess;

++guessCount;

if(myGuess<myNumber) {

cout << "Higher!" << endl;

}

if(myGuess>myNumber) {

cout << "Lower!" << endl;

}

if(myGuess==myNumber) {

cout << "You got it in " << guessCount << " guesses!" << endl;

}

}

cout << "Do you want to play again? 'y' or 'n': ";

cin >> playAgain;

}

}

### Lab 2

#include <iostream>

#include <time.h>

using namespace std;

// These all go to separate files ... combined here for brevity

namespace min {

void process(int value);

void report();

}

namespace max {

void process(int value);

void report();

}

namespace even {

void process(int value);

void report();

}

namespace odd {

void process(int value);

void report();

}

namespace fortyTwo {

void process(int value);

void report();

}

namespace sum {

void process(int value);

void report();

}

namespace average {

void process(int value);

void report();

}

// These all go to separate files ... combined here for brevity

namespace min {

int min = INT\_MAX;

void process(int value) {

if(value<min) {

min = value;

}

}

void report() {

cout << "Minimum value is " << min << endl;

}

}

namespace max {

int max = INT\_MIN;

void process(int value) {

if(value>max) {

max = value;

}

}

void report() {

cout << "Maximum value is " << max << endl;

}

}

namespace even {

int count = 0;

void process(int value) {

if( (value%2) == 0) {

count = count + 1;

}

}

void report() {

cout << "Number of even values " << count << endl;

}

}

namespace odd {

int count = 0;

void process(int value) {

if( (value%2) == 1) {

count = count + 1;

}

}

void report() {

cout << "Number of odd values " << count << endl;

}

}

namespace fortyTwo {

int count = 0;

void process(int value) {

if(value == 42) {

count = count + 1;

}

}

void report() {

cout << "Number of 42s " << count << endl;

}

}

namespace sum {

int sum = 0;

void process(int value) {

sum = sum + value;

}

void report() {

cout << "Sum of all values " << sum << endl;

}

}

namespace average {

int count = 0;

int sum = 0;

void process(int value) {

count = count + 1;

sum = sum + value;

}

void report() {

float a = sum;

float b = count;

cout << "Average of all values " << a/b << endl;

}

}

int main() {

while(true) {

cout << "Value (0 to end): ";

int value = 0;

cin >> value;

if(value==0) {

min::report();

max::report();

even::report();

odd::report();

fortyTwo::report();

sum::report();

average::report();

return 0;

} else {

min::process(value);

max::process(value);

even::process(value);

odd::process(value);

fortyTwo::process(value);

sum::process(value);

average::process(value);

}

}

}