CS319 **CLASS TEST**: 21 Feb 2025

When done, upload your work to Canvas: **2424-CS319** ... **Assignments** ... **Class Test**.
Link: `https://universityofgalway.instructure.com/courses/31862/assignments/106850`

Instructions:

- **You have 50 minutes to complete the test**
- **Answer all three questions**.
- Your solution of each question should be in the form of a C++ program. You can prepare your solutions as a a single file, or one file per question (as you prefer). Each of your files should include comments with your name, ID number, and email address.
- Submit your work by uploading to Canvas: **2424-CS319** ... **Assignments** ... **Class Test**, or using the link above.

  If you encounter problems with that, email it to niall.madden@universityofgalway.ie
- This is an "open book" test: you can use your lecture notes, and any other resource at `https://www.niallmadden.ie/2425-CS319`. **You may not use any other resource during the test, such as generative AI.**
- **You may not communicate with anyone during the test**.

It may help to know that

- **`int a[10];`**
  creates an array (list) of 10 integers called $a[0]$, $a[1]$, ..., $a[9]$.
- The **`rand()`** function returns an **`int`** between 0 and `RAND_MAX`
- **`x=rand()%n`**;
  sets **`x`** to be a random int between 0 and $n-1$.
- If **`a`** is an `int`, one can set the `float` **`b`** to be the corresponding `float` value by setting
  `b = (float) a;`

Q1 Here is part of a C++ program that

(a) defines integer variables **`a`** and **`b`**;

(b) prompts the user to enter values of a and b;

(c) reads the values the user enters;

(d) informs the user which of the values is smaller, or if the values are the same.

The code provided does Step (a), but not steps (b), (c) and (d).

```
#include <iostream>

int main(void)
{
  int a, b;    // Part (a)

  // Code for Part (b) goes here

  // Code for Part (c) goes here

  // Code for
  // Part (d)
  // goes here

  return(0);
}
```

The goal of Q1 is to test if you can compile and run a C++ program, do basic input and output, and write an **`if`***-statement.*

Q2 Write a program that works as follows.

(a) the program has a function with header
`int SumArray(int list[], int len);`
which returns the sum of the entries in the array **`list[]`**, which is of length **`len`**.

(b) In the **`main()`** function, an integer array of length **15**, called **`Q2`** is defined.

(c) Then a **`for`** loop to used to sets the entries of this array to be a random number **between 1 and 20** (inclusive).

(d) Then, in **`main()`** the **`SumArray()`** function to called, and the sum of the entries in the list is reported.

The goal of Q2 is to verify that you are competent writing **`for`***-loops and functions.*

Please turn over the page

Q3 (a) Write a program that has a function with header
`float RandFloat(float a, float b);`
that takes a two `float` arguments, **`a`** and **`b`**, and returns a random `float` that is between a and b.

(b) In your **`main()`** function, verify that **`RandFloat()`** works by

- Prompting the user to enter values of a and b;
- Check that $a < b$. If not, prompt the user for new values.
- Outputs a random float between a and b.

The purpose of Q3 is to verify that you can read input, write functions, and use **`if`** *(or* **`while`***) statements.*