

CS1115 Prelim Review Lab (October 10, 2013)

Completing the lab is very important, but your work is not graded and it is not submitted. If you finish before the hour is over, then you can leave early or you can work on the "Finished Early" problems. If you do not finish the problems before the end of class, then be sure to ask enough questions so that you can complete the exercises in the next day or two on your own.

1 Birthdays

The `sort` function can be used to order the value in vector. Thus

```
x = [10 80 30 40 60 30];
y = sort(x)
```

assigns the vector [10 30 30 40 60 80] to `y`. Complete the following function so that they perform as specified:

```
function alfa = Triple(x)
% x is a length-n vector of integers.
% alfa is one if at least three of the component values in x are the same. If not, alfa is zero.
```

Write a script that for `N = 20:5:100` estimates the probability that at least three students in a class of N students have the same birth date. Make use of `Triple`

2 Pythagorean Triangles

A triangle is said to be a Pythagorean triangle if (a) its sides have integer length and (b) the square of one side is the sum of the squares of the other two sides. Write a script that computes the number of Pythagorean triangles whose sides are each less than or equal to 10000.

3 Words

Complete the following function so that it performs as specified:

```
function s = RandString(n,letters)
% letters is a string consisting of m distinct characters.
% s is a length n string whose characters are randomly selected from
% letters.
```

If `s` is a length n string and i and j are integers that satisfy $1 < i \leq j < n$, then we say that `s(i:j)` is a *word* if it contains no blanks and `s(i-1)` and `s(j+1)` are blanks. Complete the following script so that it prints out the length of the longest word in `s`:

```
n = 1000;
letters = 'abcdef ';
s = [ ' ' RandString(n,letters) ' ' ];
```