**UNCA CSCI 107**
**Ordinary Exam 1**
13 October, 2015

This is a closed book and closed notes exam. It is to be turned in by around 10:40 AM for the morning section and 2:20 PM for the afternoon section. That will give you enough time for the practical.
Communication with anyone other than the instructor is not allowed during the exam. Calculators may be used during this exam, but cell phones and any other electronic or communication devices may not.

Name:_____

**Problem 1 (4 points) Database query A**
Complete the following table to make a query for all customers with the FirstName of 'Smith' from the City of 'Asheville'.

| | | | | | | |
|---|---|---|---|---|---|---|
| Field: | CustomerID | LastName | FirstName | City | State | Zip |
| Table: | CUSTOMER | CUSTOMER | CUSTOMER | CUSTOMER | CUSTOMER | CUSTOMER |
| Sort: | | | | | | |
| Show: | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ |
| Criteria: | | | | | | |
| or: | | | | | | |

**Problem 2 (4 points) Database query B**
Complete the following table to make a query for all customers with a CustomerID less than 10000.

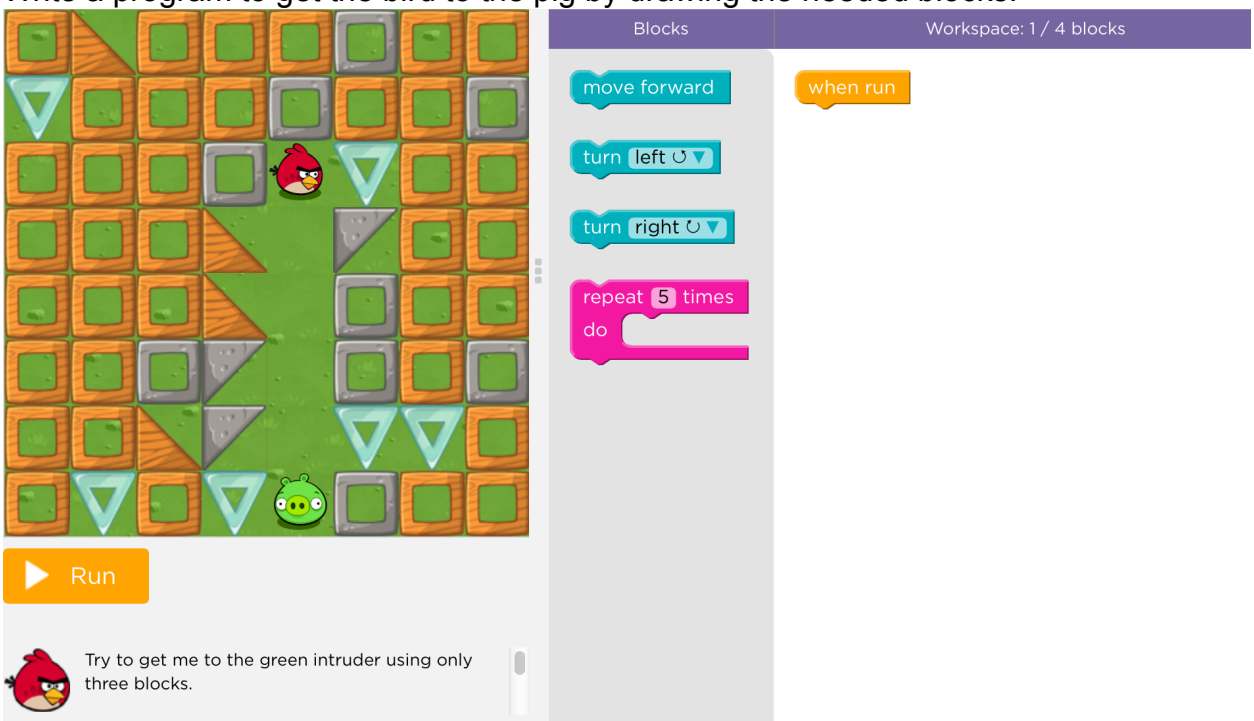
| | | | | | | |
|---|---|---|---|---|---|---|
| Field: | CustomerID | LastName | FirstName | City | State | Zip |
| Table: | CUSTOMER | CUSTOMER | CUSTOMER | CUSTOMER | CUSTOMER | CUSTOMER |
| Sort: | | | | | | |
| Show: | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ |
| Criteria: | | | | | | |
| or: | | | | | | |

**Problem 3 (4 points) Database query C**
Complete the following table for all customers whose City is either 'Waynesville' or 'Franklin'.

| | | | | | | |
|---|---|---|---|---|---|---|
| Field: | CustomerID | LastName | FirstName | City | State | Zip |
| Table: | CUSTOMER | CUSTOMER | CUSTOMER | CUSTOMER | CUSTOMER | CUSTOMER |
| Sort: | | | | | | |
| Show: | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ |
| Criteria: | | | | | | |
| or: | | | | | | |

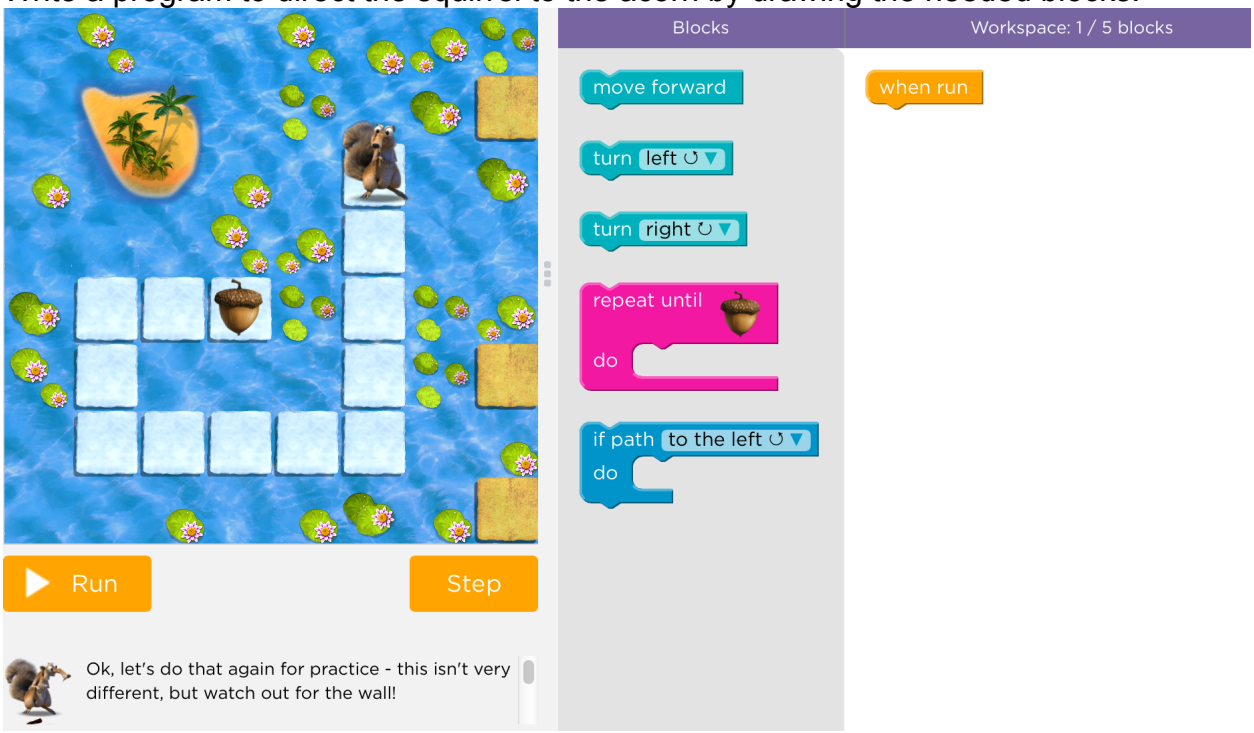
**Problem 4 (10 points) Hour of code**

Write a program to get the bird to the pig by drawing the needed blocks.




**Problem 4 (14 points) Hour of code**

Write a program to direct the squirrel to the acorn by drawing the needed blocks.



*Let's do this like they do math in elementary school today!*
**You must *briefly* explain your reasoning for each answer *or* show the formula.**
**Some of explanations will be very brief.**

**Problem 5 (6 points)**
How many values can be encoded using 5 bits?

**Problem 6 (6 points)**
If you want to encode 44 possible values, how many bits are needed.

**Problem 7 (6 points)**
List the bitstrings of length 2.

**Problem 8 (18 points)**
Suppose 3 minutes of music is sampled at the rate of 24000 samples per second. How many samples will be taken?

If the samples are digitized at a bit depth of 16 bits. How many bits will be generated.

If the encoded bits stream is stored in a file, what is the size of the file in kilobytes?

**Problem 9 (15 points)**
Write a one sentence explanation of each of the three elements (or control structures) of programming:

- Sequencing

- Selection

- Iteration

**Problem 10 (13 points)**
Let's have a few questions about sound and sampling.

First, what is the range of hearing, in Hertz, for humans?

Second, according to the Nyquist theorem, what sampling rate is needed to accurately sample music for human hearing.

Third, a soprano C high has a frequency of 1046.5 Hz. Suppose a digital recording of an a cappela recording dropped all audio frequencies about 4000 Hz (almost two octaves above the highest soprano). Do you think most listeners would notice the difference?