ICS3U **Review – Unit #3 Repetition**

**Repetition:** In this unit, the following topics were studied:

* For Loops – counted loops

for i in range(10):

print(i\*i)

* While Loops – conditional loops

total = 0

while total < 20:

total += 3

print(total)

(including sentinels)

* Number Systems – Binary and Hexadecimal   
  Two ways that the computer represents symbols and numbers. Be sure to be able to:
* Convert from Binary to Decimal (and vice versa) – by hand and by writing a Python program
* Convert from Hex to Decimal (and vice versa) – by hand and by writing a Python program (only from decimal to hex)
* Random Module

import random

#Two ways to simulate flipping of a coin

flip = random.randomint(1,2)

flip = random.randomchoice(“HT”)

#Randomly choose floating point number between 1 and 10

num = 9\*random.random() + 1

* **Try and Except**

#Initialize variables

num2 = 0

#Input

while num2 == 0:

try:

num1 = float(input("Enter number 1: "))

num2 = float(input("Enter number 2: "))

except:

print("You need to enter two numbers and \

the second number can't be 0!")

* **Nested Loops – Using for loops inside of for loops to build interesting patterns and tables**

**Exercises**

1. Indicate the output of the following programs.

a) for k in range(-1, 3):

print(k + 2)

1

2

3

4

b) start = 6

end = 10

step = 2

for i in range (start, end + 1, step):

print(i\*i)

36

64

100

c) for j in range (5, 0, -1):

print(str(j) + " seconds")

5 seconds

4 seconds

3 seconds

2 seconds

1 seconds

2. Convert 15310  to binary. Convert 010100112 to decimal. Convert A19E16 to decimal. Convert 9E8C16 to binary.

10011001, 83, 14+

3. Print a table of values of the function f(x) = 2x + 5 for the indicated values of x.

|  |
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| SAMPLE OUTPUT |
| x= 6, 2x + 5 = 17  x= 5, 2x + 5 = 15  … |

For example: if x = 6, 5, 4,….0

1. x = 0, 3, 6, …., 30
2. x = -15, -10, -5, ….. 15
3. x = 1, 2, 4, 8, …., 1024

4. Use a for loop to prompt and input 10 integers, then calculate and output the average of the ten numbers. Modify your program to allow the user to say “Done” at any time to stop the program.

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| Sample Output |
| I am so smart  Do you wish to continue? Yes  I am so smart  Do you wish to continue? No  Number of times the loop was executed: 2 |

5. Write a program that will:

* print the line: “I am so smart”
* asks the user if they wish to continue. Stop the program  
  when the user enters “no”
* prints the number of times the line is printed

6. At present there are 10 animals in a lab and enough food for 1000 animals. Every hour the population of animals doubles, and enough food is added for 4000 more animals than the previous hour. Use a while loop to determine when the population will outgrow the food supply. Display a line of information each time the loop is executed.

7. Remember this code?

num = int(input("Enter a positive integer: "))

while num >= 1:

digit = num % 10

num = num//10

print(digit)

Write a program that ….

a) Counts the total number of 8’s in a number

b) Determines the product of all the digits in the number

c) Counts the number of odd and even digits in the number

7. Generate three random integers between 1 and 20, and check if exactly two of them are the same. Modify your program to also output the largest number, and list the even numbers.

8. Modify any of the above programs to include error checking using try and except.