**EM224 EXAM 1 Name Zack Edwards\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Section 1: General questions – Please use a .doc/.pdf file for your answers**

1. What is testing a program? Why this is relevant and how the Test Development can be applied?

Testing a program is running it over and over again and inputting every possible type of variable for each input to test whether the code will perform properly or if something will go wrong indicating an error which needs to be addressed. This is relevant because it is a very important part of the Test Development cycle where we develop the code and then test it to find any bugs.

1. Explain the differences between lists and dictionaries in Python

Both are groups of stored information which a python file can access and manipulate but the main difference is that lists are ordered and can be called upon with indices (such as i[1][4]) and dictionaries are unordered and each element can be accessed with its key.

1. In Python, how can we extract/print from a string the substring starting from the character “@” (assuming it is in the string) to the end of the string?

str = ‘apples@gmail.com’

print(str[@:])

1. Explain the differences between lists and dictionaries in Python

n/a

1. Why project management is important in Software Development projects?

In software development projects there can be many different people working on different parts of the code but for the final product all those parts and all of those people need to work seamlessly together. In order to achieve this you need strong project management oversight to make sure that at the end of the development cycle all the parts can come together as a whole.

**Section 2: Code checking – Please use the same .doc/.pdf file you used for Section 1 for your answers on this Section**

1. What is the output of this code fragment? Are all the branches relevant for the script?

*x= 3*

*if 2 > x :*

*print 'First print'*

*else :*

*print 'Second'*

*if 2 > x :*

*print 'Third'*

*print 'Fourth'*

*print 'End'*

the output of this code would be:

Second

Fourth

End

Not all parts of the code are relevant. The redundant code is:

(“*if 2 > x*

print 'Third') because if x is less than 2 then it will already have printed ‘First print’ and not have moved on to the ‘else’ part of the code.

Also the code needs parentheses after the print statements around the desired message we want to print.

1. Describe what the code below does, explain why it could crash and how to prevent the eventual crash:

*lower = int(input("Enter lower range: "))*

*upper = int(input("Enter upper range: "))*

*for num in range(lower,upper + 1):*

*if num > 1:*

*for i in range(2,num):*

*if (num % i) == 0:*

*break*

*else:*

*print(num)*

This code takes a range as an input and then determines and prints all odd numbers in that range. It does this by taking each number in the range and then dividing it by two. If there is a remainder then it knows it is an odd number and so prints it. However the line ‘if num > 1:’ needs to be indented in order for this to work.

1. Correct the following code. Please note: *Any variables used are assumed to be defined somewhere in the program*

correct code

*#This code prints HELLO five times*

*# then prints GOOD-BYE*

*count = 0*

*while count < 5:*

*print 'HELLO'*

*print ‘GOOD-BYE’*

corrected code:

count = 0

while count < 5:

print('HELLO')

count = count + 1

print('GOOD-BYE')

correct code

*# This code divides a number by 10 and prints the result as*

*# a floating number, such as: 43.6*

*mynum = 436*

*print mynum/10*

*corrected code:*

*mynum = 436*

*print(mynum/10)*

correct code

*# This code will print ODD if the integer*

*# innum is odd, otherwise it will print EVEN*

*invalue = raw\_input('Type an integer number ')*

*innum = int(invalue)*

*if innum %2 == 0:*

*print 'ODD'*

*else:*

*print 'EVEN'*

Corrected code:

invalue = input('Type an integer number ')

innum = int(invalue)

if innum %2 == 0:

print ('EVEN')

else:

print ('ODD')

It needed parenthesis around the subjects of the prints and the Even and odd bits were switched and needed to be the other way around. Also my compiler did not recognize raw\_input and I had to change it to input.

**Please see the attached file “exam1Q678.py” for the answers to 6 7 and 8**

**[NOTE: no check of the user input is required]**

**Section 3: Writing code – Please submit 1 single .py file with all the scripts**

1. Write a script that takes a character (i.e. a string of length 1) as input from the user and returns *True* if it is a vowel, *False* otherwise. A check on the length of the input string and its being alphabetical is required
2. Write a script that calculates the average word length and longest word of a text stored in a file. Please note:

* The name of the file is *word\_list.csv* and it doesn’t need to be asked to the user (meaning the name will be in the code)
* Assume that the file contains *n* records, each one composed by 1 word. Words can be present more than once, but only unique words need to be considered
* A sample word\_list.csv file is attached for testing

1. Write a script that takes a string as input from the user and prints a string where for every character in the original, there are three characters (example: 'The' → 'TTThhheee'). [NOTE: no check of the user input is required]

**Please see the attached file “exam1Q9,10,11.py” for the answers to 9 10 and 11**