COMP 1405B2 (Thursday)
Introduction to Computer Science I
Midterm #1 – October 3rd, 2019

Part 1 [10 marks total, 2 marks each]

Answers for Part 1 questions do not require a lot of detail. You just need to demonstrate that you understand the concepts. **You should enter your answers to the Part 1 questions in the part1.txt file**.

1.1 What is a variable?
1.2 List two comparison operators and give examples of how they are used.
1.3 What does the assignment statement do? Give a small example.
1.4 Name 2 logical operators.
1.5 Why is indentation important in Python? What purpose does it serve?

Part 2 [10 marks total, 5 marks each]

Answers for Part 2 require you to show all of your work. Answers that do not show the work involved will receive a mark of 0. **You should enter your answers to the Part 2 questions in the part2.txt file**.

2.1 Convert the decimal number 177 to binary.
2.2 Convert the binary number 0b1100110 to decimal.

Part 3 [10 marks]

Write the code for this part in the part3.py file. Write a program that asks the user to specify "yes" or "no" for the following two questions:

1. Is there dirt here?
2. Is there empty space ahead?

After the user answers these two questions, the program must then print out what a vacuum cleaning robot should do: "vacuum", "move forward", or "turn right". The robot should always vacuum if there is dirt present. If there is no dirt present, the robot should move forward if it can (i.e., when there is empty space ahead) and turn right if it cannot move forward. You can assume the user will only enter "yes" or "no" for both questions.

Part 4 [10 marks total]

Write the code for this part in the part4.py file. Write a program that asks a user to enter three distances in miles. Once the user has entered all three distances, the program should then print out the one distance that is closest to 15 kilometers. You should use a conversion rate of 1 mile = 1.6 kilometers. Note that you can use the command *abs(x)* to find the absolute value of a number *x*. You can assume the user will enter numbers each time, but these numbers may contain decimal numbers.