CSC 106, Spring 2018, Assignment #2

Due: February 23, 11:55 pm on the connex site.
Files to hand in
q1.pdf
q2.pdf
q3.txt
q4.txt
These files contain your answers
to the following 4 questions.
10 marks total
Worth 10% of your final grade

Question 1: Logical expression [2 marks]

a	b	c	.
F	F	F	F
F	F	T	T
F	T	F	F
F	T	T	T
T	F	F	F
T	F	T	T
T	T	F	T
T	T	T	T

Write a **logical expression** that produces the truth table depicted.
You may use AND, OR and NOT.

Question 2: Gates [4 marks]
Use AND, OR and NOT Gates to build a circuit for the following truth table:

a	b	c	¬((¬a ∧ c) ∨ b)
F	F	F	T
F	F	T	F
F	T	F	F
F	T	T	F
T	F	F	T
T	F	T	T
T	T	F	F
T	T	T	F

Question 3: Sorting [2 marks]
Research the sorting algorithm "Timsort"
https://en.wikipedia.org/wiki/Timsort, and other sources you can find.

In your own words, discuss the advantages and disadvantages of this sorting algorithm with regards to the efficiency of algorithms as discussed in chapter 3 and the lectures. (Hint: compare it to other sorting algorithms). Write a 100-200 word answer.

Question 4: Vigenère cipher [2 marks]
Research the Vigenère cipher:
https://en.wikipedia.org/wiki/Vigen%C3%A8re_cipher, and other sources.
(This cipher will also be shown in your lab)

Using the key : *yyj* encrypt your name. For example using this key my name: *tibor* would be encrypted as: *rgkmp.*
Your answer should look like this:

key: yyj
plain text: <YOUR_NAME>
encrypted text: <YOUR_NAME_ENCRYPTED>