CS 312 Homework

(1) The similar is that the shortest-Path for traveling-salesman is to walks a Path in the graph and find the shortest Path. The different is that the traveling-Salesman needs more Points to return the first Point, because the shortest Path is just a Path between two Points.

(2) A real-world Problem in which only the best Solution will do might be giving a sorting a list by algorithm. Finding the shortest Path approximately will do it.

(3) $8n^2 \leq 64n\lg n$

$8n^2$: insertion sort time

$64n\lg n$: merge sort time

$8n^2 \leq 64n\lg n$

$n \leq 8\lg n$

$\frac{1}{8} \leq \frac{\lg n}{n}$

$n \leq 43$

we see that Merge Sort the elements faster than insertion sort.

(4) $100n^2 \leq 2^n$

$100n^2$: the first algorithm

consider $n=2$

$100n^2 = 100 \times 2^2$

$= 400$

2^n: the second algorithm.

the second Algorithm is

$2^n = 2^2$

$= 4$

if $n=3$

$2^n = 2^3$

$= 8$