15-110 (Principles of Computing)
Refresher: Week 2

September 1, 2024

Name _____

1. **Session opener** : Jumbled Algorithm (5 minutes)

   Given three numbers, we want to find the greatest of the three in value. We have jumbled an algorithm for the task. Reorder the algorithm to find the greatest of three numbers.

   (a) Given three numbers a, b, c

   (b) No : c is the greatest

   (c) Yes : b is the greatest

   (d) Yes : a is the greatest

   (e) Yes : is a $>$ c

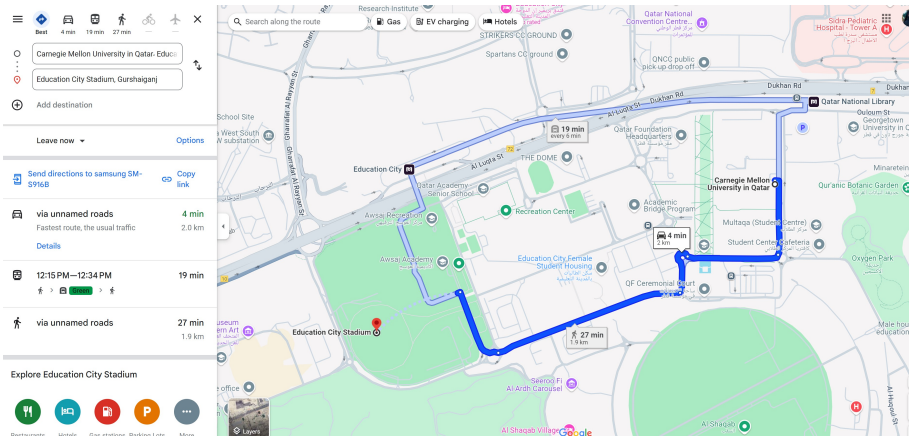
   (f) No : c is the greatest

   (g) is a $>$ b

   (h) No : is b $>$ c

2. (10 minutes)

   (a) **Act like a programmer :** The Education City hosted one of the most thrilling matches of FIFA World Cup 2022, when Croatia beat Brazil in a penalty shoot out. Have you visited the EC-Stadium yet? No ?! Let's learn the path to EC stadium from the Google maps snip given below: Your task is to write an



   algorithm for your friend to reach the stadium from CMU-Qatar after referring to the map . Be precise and simple.

(b) **Act like a computer :** What is the output of the program when a = 4, b = 4, c = 1?

1. Input: a, b, c
2. d = $\sqrt{(b \times b) - (4 \times a \times c))}$ (take the positive root)
3. If d > 0 :
   (a) Yes: $x1 = \frac{-b+d}{2a}$, $x2 = \frac{-b-d}{2a}$
   (b) No: Is d = 0:
      i. Yes: $x1 = \frac{-b}{2a}$, $x2 = \frac{-b}{2a}$
      ii. No: If d > 0:
         A. Yes: x1 = does not exist, x2 = does not exist
         B. No: Do nothing
4. Return x1 , x2

3. (10 minutes)

(a) **Act like a computer :** What is the output of the program when num = 3 count = 0 ?

1. Input - num, count
2. Is $num \leq 0$?
   (a) Yes : Answer is "not a nice number"
   (b) No: Repeat for i = 1 .... Num (inclusive)
      i. Is i an even number :
         A. Yes : count = count + 1
         B. No : Do nothing
3. If count = 2 :
   (a) Yes : Answer is "a nice number"
   (b) No : Answer is not "a nice number"

(b) **Act like a programmer :** Mohammed is taking three courses this semester and all his exams are out of 10 points. He aims to score above 90 percentage as his final average. Write an algorithm for Mohammed so that he can calculate his average at the end of the semester.

4. **Session Closer :** (5 minutes)

I have two breads, a jar of Nutella, and a knife. Write an algorithm to make a Nutella sandwich, or have fun watching this video and have fun learning