**The assignment 2 (The first-order logic)**

1. Represent the following sentences in first-order logic using predicates with constants, variables, connectors and quantifiers. Remember to define a consistent vocabulary and write its semantics in English. (10 points)
2. This box contains a huge number of books.
3. The TCRI building is located near a subway station
4. There is only one laboratory that contains test tubes
5. Every hunter knows the location of pheasants
6. A military base that is located near the nuclear test site
7. Arthas has a rune blade, and he summons Sindragosa.
8. All players were tired, so they lost the game
9. Snow molt or it was kept frozen
10. Consider a simplified representation of campus maps in the first order logic. Assume that there are two interpretations. The first one (Imtu) represents a simplified map of Michigan Tech (MTU), and the second one (Ipitt) represents a simplified map of the University of Pittsburgh. In both maps, the cardinal directions are placed in the standard way. For instance, north is towards the top, and east is towards the right. Every name except “Main campus walkway”, “Forbes Avenue”, and “Schenley plaza” refer to buildings. “Main campus walkway” is a walkway, it can't be driven on. “Forbes Avenue” is a road that cars can drive on. “Schenley plaza“ is a park. (10 points)





For each sentence below, determine if it is true in interpretation Imtu and in interpretation

Ipitt.

Part a. $∃X is-building(X)$

Part b. $∃X is-park(X)$

Part c. $∀X north-of\left(X, Schenley-Plaza\right) ˅ west-of(X, Schenley-Plaza)$

Part d. $∃X∀Y is-park\left(X\right) ˄ west-of(Y,X)$

Part e. $∀X,Y,Z west-of\left(X,Y\right) ˄ west-of(Y,Z)$