**COMP1201 Assignment 2**

Q1:

*What we are given:*

* Hash function with separate chaining.
* Takes an integer **(n < 100 000)**.
* Calculates the value as **(2d1 + 3d2 + 5d3 + 7d4 + 11d5) % 47**, where d1 is the most significant digit and d5 is the least significant digit.
* We enter **2000** numbers.

*What we need to prove:*

* Prove that there exists a number **x** **(0 <= x <= 46)** for which we can find **at least 43** numbers among the **given** **2000**, whose **hash** **value** is exactly **x**.

*Proof:*

First, when a hash table has separate chaining, it mean that we build a singly-linked list at each table entry. If the keys for two elements are the same, then both of the elements are added to the corresponding singly-linked list.