# **CMPG 315 – Text Messaging Application – Design Notes**

**Frontend**: Visual Studio C# Windows Form Application (.NET Framework)

**Backend**: Firebase – Specifically Firestore database (NoSQL database)

## Firestore Database design

### Terminology

* **Collection** -> Refers to a **table** in SQL.
* **Document** -> Refers to a **record** (row) in SQL.
* **Field** -> Refers to an **attribute** (property) in SQL.

## Users collection

* A user provides their **email (string)** when signing up. Each user must have a unique (no duplicates) email address.
* **Username (string)** of each user on the application must be unique (no duplicates).
* Each user must provide their **first name (string)** and **last name (string)** when signing up.
* A user must also provide a **password (string)** of at least 6 characters. The password must also be encrypted using a very simple encryption algorithm (Caesar cipher with a shift of 3 for example).
* A user has **contacts (array of references)** that will store a list of document\_id’s of other users that the user has connected with.

## Groups Collection

* A group is has **a created\_at (timestamp)** that represents the date and time the group is created on.
* A group has a **created\_by (reference)** that is the document\_id of the user that created the group.
* A group has a **title**.
* A group has a **description**.
* A group has **participants (array of references)** that contains the document\_id’s of the users who are part of the group (including the user who created the group).

## Messages

* Messages has a **body (string)** that is the actual text a user wants to send.
* Messages has a **created\_at (timestamp)** which is the date when the message was send.
* Messages has a **read\_at (timestamp)** which is the date when the message was read by the recipient (in case of group message, this can be null).
* A message has a **sender\_id (reference)** that points to the document\_id of the user in the users collection who has sent the message.
* A message then also has a **group\_id (reference)** and a **recipient\_id (reference)**, either of which is null when the other one has a value. When a message is sent on a *group*, the group\_id field is populated and the recipient\_id will then be null. When a message is sent *privately*, the group\_id will be null and the recipient\_id will have a document reference to a user in the users collection.