Queen Mary
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Individual Coursework

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Module Name:Functional Programming

Module Code:ECS713P/ECS713U

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Instructions to compile and run code : To run this code first open the project folder using VS Code, then execute the command ‘stack build’ into the PowerShell terminal within VS Code to compile the program.Later the the code can be run by using the comand stack run which will start running all the threads concurrently.

Design choice justification : I have gone with a simple realistic model.Where recievers and messages are picked in a random fashion using its own separate threads.Theres a thread for pending messages which checks for any messages pending to be sent.Then later we have our main thread process where everything basically happens.Our first thing what we do in this thread is to make sure the model doesn’t do extra iterations.There are chance model goes few iterations extra due to concurrency, so it makes a check in a way for worst case the model doesn’t do more than 110 iterations.

The next step it has is to check incase of no messages to be sent it adds a message.Later we display the sender and reciever of the message along with the message itself and we append the message to the counting and the message gets appended.Extra feature which I implemented was If a user sends more than 10 messages to anyone show him as a spammer by using a counter and dispalying the specific output "The specific user needs to chill,he's spamming".For the sake of counting we use MVar for it as it could be altered rather than having to create a new one to implement count fuction.

Theres also a feature implemented were we check at any case if the sender and reciever picked are the same to count it as an error iteration and terminate the current count.

The library which we used to implement concurrecny is the Control.concurrent and the library used for picking random users/messages is System.Random which has a function called randomIO which hekps pick a random number.

Issues faced : One of the main issue which I faced was implementing count as we cannot update varaibles after initializing them.So had to go ahead and use MVar which helps not only in using count but also for checking message list,counting iteratons etc..