

Final Project

MengChen Chung

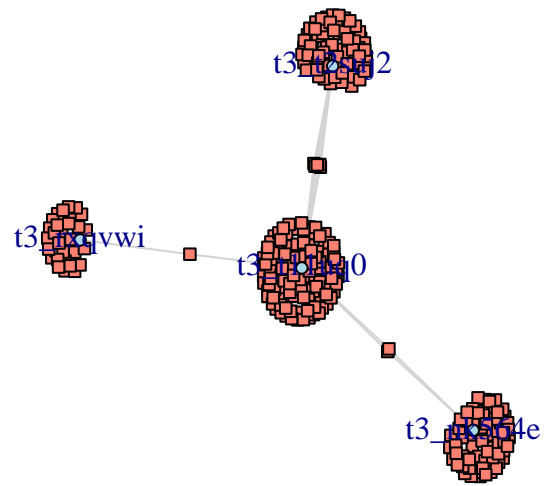
2022-04-17

```
library("igraph")
```

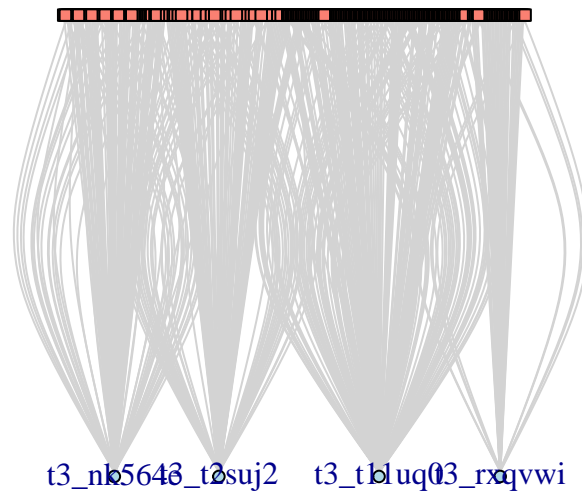
```
##  
## Attaching package: 'igraph'  
  
## The following objects are masked from 'package:stats':  
##  
##      decompose, spectrum  
  
## The following object is masked from 'package:base':  
##  
##      union
```

```
# read in data  
data <- read.csv(file = 'reddit_comments_filtered_2.csv') # Reddit comments with more than 2 comments (  
post <- read.csv(file = 'reddit_posts.csv')  
ver <- data.frame(author_id=data[, 'author_id'])  
edg <- data.frame(author=data[, 'author'], post_id=data[, 'post_id'])  
  
g <- graph_from_data_frame(edg[1:400,], directed=FALSE) # limit to 400 comments for viz
```

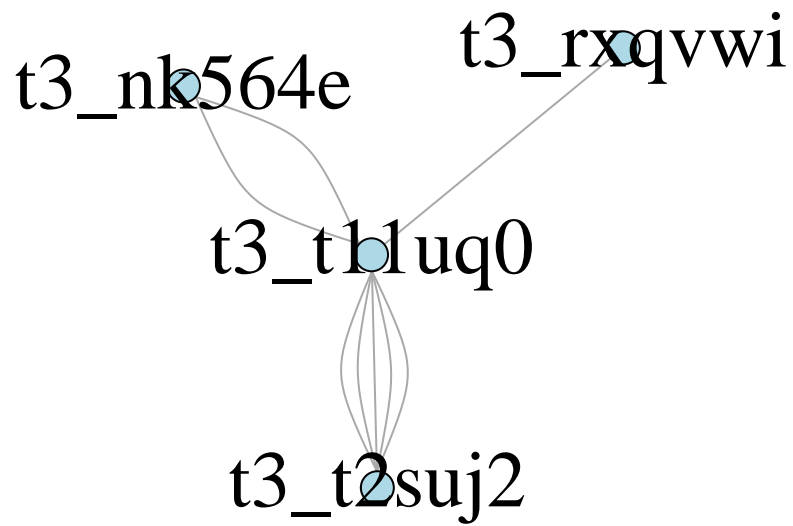
```
# one mode network  
V(g)$type <- bipartite_mapping(g)$type  
bipartite_matrix <- as_incidence_matrix(g)  
post_matrix_prod <- t(bipartite_matrix) %*% bipartite_matrix  
diag(post_matrix_prod) <- 0  
# post_matrix_prod  
  
user_matrix_prod <- bipartite_matrix %*% t(bipartite_matrix)  
diag(user_matrix_prod) <- 0  
# user_matrix_prod  
  
# visualization  
V(g)$color <- ifelse(V(g)$type, "lightblue", "salmon")  
V(g)$shape <- ifelse(V(g)$type, "circle", "square")  
V(g)$label <- ifelse(V(g)$type, V(g)$name, "")  
E(g)$color <- "lightgray"  
  
set.seed(100)  
layout = layout_as_bipartite  
plot(g, vertex.size=5)
```



```
plot(g, vertex.size=5, layout=layout)
```



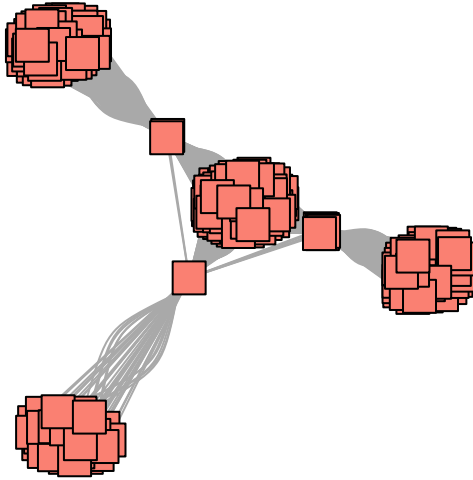
```
g_post <- graph_from_adjacency_matrix(post_matrix_prod, mode = "undirected")
plot(g_post, vertex.label.cex = 2.5, vertex.color = "lightblue", vertex.label.color = "black")
```



```

g_user <- graph_from_adjacency_matrix(user_matrix_prod, mode = "undirected")
plot(g_user, vertex.label=NA, vertex.color = "salmon", vertex.shape = "square", vertex.label.color = "b"

```



The 2-mode matrix represents any events an actor had participated in. The woman-to-woman matrix des
 # A tie for the 2-mode matrix represents this woman who had joined this event. A tie for the woman-to
 # The main diagonal of the 1-mode matrices means the "loops", a woman and herself could be counted as

```
# 4
types <- V(g)$type # getting each vertex `type` let's us sort easily
deg <- igraph::degree(g)
bet <- igraph::betweenness(g)
clos <- igraph::closeness(g)
eig <- igraph::eigen_centrality(g)$vector

cent_df <- data.frame(types, deg, bet, clos, eig)
cent_df[order(cent_df$type, decreasing = TRUE),] ## sort w/ `order` by `type`
```

##	types	deg	bet	clos	eig
## t3_nk564e	TRUE	96	15531.5	0.0010928962	1.000000e+00
## t3_t2suj2	TRUE	96	16406.0	0.0011198208	3.643338e-03
## t3_t1luq0	TRUE	169	34429.5	0.0016528926	1.050813e-01
## t3_rxqvwi	TRUE	39	8496.0	0.0009643202	4.117441e-04
## Fuzzy_darkman	FALSE	10	0.0	0.0008361204	5.696086e-01
## Dewahl1	FALSE	1	0.0	0.0008361204	5.696086e-02
## harabajji	FALSE	1	0.0	0.0008361204	5.696086e-02
## AsianInvasion00	FALSE	3	0.0	0.0008361204	1.708826e-01
## Gonads_of_Thor	FALSE	1	0.0	0.0008361204	5.696086e-02
## papachef69	FALSE	1	0.0	0.0008361204	5.696086e-02

## jeefray	FALSE	2	6867.0	0.0013157895	6.294638e-02
## jfenton9817	FALSE	1	0.0	0.0008361204	5.696086e-02
## mbleslie	FALSE	2	0.0	0.0008361204	1.139217e-01
## Budmanes	FALSE	1	0.0	0.0008361204	5.696086e-02
## urbanlife78	FALSE	1	0.0	0.0008361204	5.696086e-02
## scrandis	FALSE	1	0.0	0.0008361204	5.696086e-02
## spodgod42	FALSE	1	0.0	0.0008361204	5.696086e-02
## imstillfly	FALSE	1	0.0	0.0008361204	5.696086e-02
## redRabbitRumrunner	FALSE	2	0.0	0.0008361204	1.139217e-01
## TurbulentMiddle2970	FALSE	1	0.0	0.0008361204	5.696086e-02
## yingyangyoung	FALSE	1	0.0	0.0008361204	5.696086e-02
## whakea	FALSE	1	0.0	0.0008361204	5.696086e-02
## Serious_Stage	FALSE	2	0.0	0.0008361204	1.139217e-01
## MrFlags69	FALSE	1	0.0	0.0008361204	5.696086e-02
## OurCowsAreBetter	FALSE	1	0.0	0.0008361204	5.696086e-02
## velcroforeveryone	FALSE	1	0.0	0.0008361204	5.696086e-02
## TodaysTomSawyer777	FALSE	1	0.0	0.0008361204	5.696086e-02
## Vanguard-003	FALSE	1	0.0	0.0008361204	5.696086e-02
## cummingj69	FALSE	1	0.0	0.0008361204	5.696086e-02
## Diegobyte	FALSE	1	0.0	0.0008361204	5.696086e-02
## JimCracksJokes	FALSE	1	0.0	0.0008361204	5.696086e-02
## stirrednotshaken01	FALSE	1	0.0	0.0008361204	5.696086e-02
## Pixilmon69420lololol	FALSE	2	0.0	0.0008361204	1.139217e-01
## BennoWutzi1954	FALSE	2	0.0	0.0008361204	1.139217e-01
## IceDragon13	FALSE	1	0.0	0.0008361204	5.696086e-02
## wretch5150	FALSE	1	0.0	0.0008361204	5.696086e-02
## BidenWontMoveLeft	FALSE	10	0.0	0.0008361204	5.696086e-01
## banditx19	FALSE	1	0.0	0.0008361204	5.696086e-02
## Initial-Tangerine	FALSE	1	0.0	0.0008361204	5.696086e-02
## SyphiliticScaliaSayz	FALSE	2	0.0	0.0008361204	1.139217e-01
## tomjoads	FALSE	3	0.0	0.0008361204	1.708826e-01
## Doctor_Y000U	FALSE	1	0.0	0.0008361204	5.696086e-02
## ikebuck16	FALSE	1	0.0	0.0008361204	5.696086e-02
## gsfgf	FALSE	1	0.0	0.0008361204	5.696086e-02
## CorndogFiddlesticks	FALSE	1	0.0	0.0008361204	5.696086e-02
## FILTER_OUT_T_D	FALSE	1	0.0	0.0008361204	5.696086e-02
## TheKevinShow	FALSE	1	0.0	0.0008361204	5.696086e-02
## MidgetGalaxy	FALSE	1	0.0	0.0008361204	5.696086e-02
## MrFrequentFlyer	FALSE	1	0.0	0.0008361204	5.696086e-02
## jjwax	FALSE	1	0.0	0.0008361204	5.696086e-02
## Shifter25	FALSE	2	0.0	0.0008361204	1.139217e-01
## Hahaheheme3	FALSE	1	0.0	0.0008361204	5.696086e-02
## kurisu7885	FALSE	2	6867.0	0.0013157895	6.294638e-02
## Smarawi	FALSE	1	0.0	0.0008361204	5.696086e-02
## Opening-Resolution-4	FALSE	1	0.0	0.0008361204	5.696086e-02
## INTHEMIDSTOFLIONS	FALSE	1	0.0	0.0008361204	5.696086e-02
## silentrawr	FALSE	1	0.0	0.0008361204	5.696086e-02
## squeamish	FALSE	1	0.0	0.0008361204	5.696086e-02
## Deceptiveideas	FALSE	2	0.0	0.0008361204	1.139217e-01
## docwyoming	FALSE	1	0.0	0.0008361204	5.696086e-02
## LiquidInkHiveMind	FALSE	2	0.0	0.0008361204	1.139217e-01
## ominous_anonymous	FALSE	1	0.0	0.0008361204	5.696086e-02
## TheCrimsonDagger	FALSE	1	0.0	0.0008361204	5.696086e-02
## Kiyae1	FALSE	1	0.0	0.0008361204	5.696086e-02

## samcrut	FALSE	1	0.0	0.0008361204	5.696086e-02
## peerlessblue	FALSE	2	0.0	0.0008361204	1.139217e-01
## AardvarkHoliday	FALSE	1	0.0	0.0008361204	5.696086e-02
## Dicho83	FALSE	1	0.0	0.0008361204	5.696086e-02
## 8to24	FALSE	1	0.0	0.0008517888	2.075277e-04
## pierfishmarket	FALSE	1	0.0	0.0008517888	2.075277e-04
## TheSadSensei	FALSE	1	0.0	0.0008517888	2.075277e-04
## Most_Character_7976	FALSE	2	0.0	0.0008517888	4.150553e-04
## LogMeOutScotty	FALSE	1	0.0	0.0008517888	2.075277e-04
## nikhilper	FALSE	1	0.0	0.0008517888	2.075277e-04
## MrNiceBot	FALSE	1	0.0	0.0008517888	2.075277e-04
## highlander666666	FALSE	2	0.0	0.0008517888	4.150553e-04
## PrettiKinx	FALSE	1	0.0	0.0008517888	2.075277e-04
## haunted-liver-1	FALSE	1	0.0	0.0008517888	2.075277e-04
## TheBigPhilbowski	FALSE	1	0.0	0.0008517888	2.075277e-04
## AlarmedMedium9969	FALSE	2	0.0	0.0008517888	4.150553e-04
## southsidebrewer	FALSE	1	0.0	0.0008517888	2.075277e-04
## Professional_Check_3	FALSE	2	2827.4	0.0013297872	6.193047e-03
## MagicalUnicornFart	FALSE	1	0.0	0.0008517888	2.075277e-04
## Furryhare375	FALSE	1	0.0	0.0008517888	2.075277e-04
## jezz555	FALSE	1	0.0	0.0008517888	2.075277e-04
## Jerryep7	FALSE	1	0.0	0.0008517888	2.075277e-04
## Background_Scene_949	FALSE	1	0.0	0.0008517888	2.075277e-04
## siggy940	FALSE	1	0.0	0.0008517888	2.075277e-04
## _Desolation_-_Row_	FALSE	1	0.0	0.0008517888	2.075277e-04
## gaminromanian	FALSE	1	0.0	0.0008517888	2.075277e-04
## trisul-108	FALSE	1	0.0	0.0008517888	2.075277e-04
## tjt169	FALSE	1	0.0	0.0008517888	2.075277e-04
## katherinezetajones	FALSE	1	0.0	0.0008517888	2.075277e-04
## ninjas_in_my_pants	FALSE	1	0.0	0.0008517888	2.075277e-04
## The3DMan	FALSE	1	0.0	0.0008517888	2.075277e-04
## SlowSecurity9673	FALSE	1	0.0	0.0008517888	2.075277e-04
## 1890s-babe	FALSE	1	0.0	0.0008517888	2.075277e-04
## HopingToBeHeard	FALSE	1	0.0	0.0008517888	2.075277e-04
## BCHK	FALSE	1	0.0	0.0008517888	2.075277e-04
## Technical_Golf_6890	FALSE	4	0.0	0.0008517888	8.301107e-04
## Cougardoodle	FALSE	4	0.0	0.0008517888	8.301107e-04
## O-Furry-1	FALSE	1	0.0	0.0008517888	2.075277e-04
## Whiskeyjack1234	FALSE	2	2827.4	0.0013297872	6.193047e-03
## hucklebutter	FALSE	1	0.0	0.0008517888	2.075277e-04
## Ambitious_Pie_9202	FALSE	1	0.0	0.0008517888	2.075277e-04
## slim_scsi	FALSE	2	2827.4	0.0013297872	6.193047e-03
## manhatim	FALSE	1	0.0	0.0008517888	2.075277e-04
## ProbablyMatt_Stone_	FALSE	2	0.0	0.0008517888	4.150553e-04
## Bruised_Penguin	FALSE	2	2827.4	0.0013297872	6.193047e-03
## tylanol7	FALSE	1	0.0	0.0008517888	2.075277e-04
## BetterHouse	FALSE	1	0.0	0.0008517888	2.075277e-04
## examine8	FALSE	3	0.0	0.0008517888	6.225830e-04
## PresentOne2021	FALSE	2	0.0	0.0008517888	4.150553e-04
## Cambronian717	FALSE	1	0.0	0.0008517888	2.075277e-04
## recalcitrantJester	FALSE	2	0.0	0.0008517888	4.150553e-04
## mattoleriver	FALSE	1	0.0	0.0008517888	2.075277e-04
## fingerscrossedcoup	FALSE	1	0.0	0.0008517888	2.075277e-04
## Aacron	FALSE	2	0.0	0.0008517888	4.150553e-04

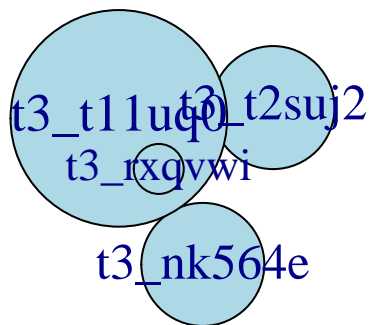
## Long_Before_Sunrise	FALSE	2	0.0	0.0008517888	4.150553e-04
## goosejail	FALSE	1	0.0	0.0008517888	2.075277e-04
## GraniteArrow	FALSE	2	0.0	0.0008517888	4.150553e-04
## raysma	FALSE	1	0.0	0.0008517888	2.075277e-04
## workerbee77	FALSE	3	0.0	0.0008517888	6.225830e-04
## A_Naany_Mousse	FALSE	1	0.0	0.0008517888	2.075277e-04
## HorseFightingLeague	FALSE	2	2827.4	0.0013297872	6.193047e-03
## JunkYardDog31	FALSE	2	0.0	0.0008517888	4.150553e-04
## BiGFanOSU	FALSE	1	0.0	0.0008517888	2.075277e-04
## Wayelder	FALSE	1	0.0	0.0008517888	2.075277e-04
## demonj00	FALSE	2	0.0	0.0008517888	4.150553e-04
## jcarter315	FALSE	1	0.0	0.0008517888	2.075277e-04
## Mr_HandSmall	FALSE	1	0.0	0.0008517888	2.075277e-04
## SnatchAddict	FALSE	1	0.0	0.0008517888	2.075277e-04
## do_you_even_ship_bro	FALSE	1	0.0	0.0008517888	2.075277e-04
## greevous00	FALSE	1	0.0	0.0008517888	2.075277e-04
## WolvesInSpaceMarines	FALSE	1	0.0	0.0008517888	2.075277e-04
## backstreets_back_ok	FALSE	1	0.0	0.0008517888	2.075277e-04
## fromtrialswisdom	FALSE	3	0.0	0.0008517888	6.225830e-04
## Maroon5five	FALSE	2	0.0	0.0008517888	4.150553e-04
## oviporus	FALSE	2	0.0	0.0008517888	4.150553e-04
## Torgosassistant2021	FALSE	1	0.0	0.0011286682	5.985520e-03
## atpcaptain	FALSE	1	0.0	0.0011286682	5.985520e-03
## PapaGeorgio19	FALSE	1	0.0	0.0011286682	5.985520e-03
## BookerDeWitt1002	FALSE	1	0.0	0.0011286682	5.985520e-03
## Sargonnax	FALSE	1	0.0	0.0011286682	5.985520e-03
## F_han	FALSE	1	0.0	0.0011286682	5.985520e-03
## Morgen019	FALSE	1	0.0	0.0011286682	5.985520e-03
## monstersammich	FALSE	1	0.0	0.0011286682	5.985520e-03
## Skullkidmusic	FALSE	1	0.0	0.0011286682	5.985520e-03
## yourlocalmilkyman	FALSE	2	0.0	0.0011286682	1.197104e-02
## AntonChigur187	FALSE	1	0.0	0.0011286682	5.985520e-03
## Antishill_Artillery	FALSE	1	0.0	0.0011286682	5.985520e-03
## youcantexterminateme	FALSE	1	0.0	0.0011286682	5.985520e-03
## Dildo_McBaggins	FALSE	1	0.0	0.0011286682	5.985520e-03
## sparty212	FALSE	1	0.0	0.0011286682	5.985520e-03
## Hijax918	FALSE	1	0.0	0.0011286682	5.985520e-03
## SaltCow4298	FALSE	1	0.0	0.0011286682	5.985520e-03
## GreggHawthorne	FALSE	2	0.0	0.0011286682	1.197104e-02
## RareBeautyEtsy	FALSE	1	0.0	0.0011286682	5.985520e-03
## saintdudegaming	FALSE	1	0.0	0.0011286682	5.985520e-03
## obeecanabee	FALSE	3	0.0	0.0011286682	1.795656e-02
## DuncanAndFriends	FALSE	1	0.0	0.0011286682	5.985520e-03
## 06boostedgoat	FALSE	2	0.0	0.0011286682	1.197104e-02
## Hi4Decades	FALSE	1	0.0	0.0011286682	5.985520e-03
## Hotmatt2021	FALSE	1	0.0	0.0011286682	5.985520e-03
## DRHaze82	FALSE	2	0.0	0.0011286682	1.197104e-02
## Mouthshitter	FALSE	1	0.0	0.0011286682	5.985520e-03
## Chaotic-Catastrophe	FALSE	2	0.0	0.0011286682	1.197104e-02
## Mary_Dont_U_wanna	FALSE	1	0.0	0.0011286682	5.985520e-03
## Jackers83	FALSE	2	0.0	0.0011286682	1.197104e-02
## rxs10is	FALSE	1	0.0	0.0011286682	5.985520e-03
## LillyPip	FALSE	2	0.0	0.0011286682	1.197104e-02
## Eiffel-Tower777	FALSE	1	0.0	0.0011286682	5.985520e-03

## PatienceSmooth5175	FALSE	1	0.0	0.0011286682	5.985520e-03
## never-ending_scream	FALSE	2	0.0	0.0011286682	1.197104e-02
## panascope	FALSE	1	0.0	0.0011286682	5.985520e-03
## Educational-Tie9809	FALSE	2	0.0	0.0011286682	1.197104e-02
## GrandeRonde	FALSE	2	0.0	0.0011286682	1.197104e-02
## oscartrudy1	FALSE	2	0.0	0.0011286682	1.197104e-02
## Commercial-Love-1989	FALSE	1	0.0	0.0011286682	5.985520e-03
## pixelburger	FALSE	1	0.0	0.0011286682	5.985520e-03
## BronwynFields	FALSE	1	0.0	0.0011286682	5.985520e-03
## crgresham	FALSE	1	0.0	0.0011286682	5.985520e-03
## Macchillerr	FALSE	3	0.0	0.0011286682	1.795656e-02
## UmpyscopeInVegas	FALSE	1	0.0	0.0011286682	5.985520e-03
## RealisticDependent26	FALSE	1	0.0	0.0011286682	5.985520e-03
## ahhhbiscuits	FALSE	1	0.0	0.0011286682	5.985520e-03
## username18379	FALSE	2	0.0	0.0011286682	1.197104e-02
## Mangar1	FALSE	2	0.0	0.0011286682	1.197104e-02
## FletchLives1980	FALSE	2	0.0	0.0011286682	1.197104e-02
## TheOxygenius	FALSE	2	0.0	0.0011286682	1.197104e-02
## SpecterHEurope	FALSE	2	0.0	0.0011286682	1.197104e-02
## NewAd6360	FALSE	2	0.0	0.0011286682	1.197104e-02
## Foxeslike2play	FALSE	2	0.0	0.0011286682	1.197104e-02
## bobbi21	FALSE	1	0.0	0.0011286682	5.985520e-03
## APsWhoopinRoom	FALSE	1	0.0	0.0011286682	5.985520e-03
## Crafty-Spot4523	FALSE	1	0.0	0.0011286682	5.985520e-03
## quietfight	FALSE	2	0.0	0.0011286682	1.197104e-02
## skipperscruise	FALSE	3	0.0	0.0011286682	1.795656e-02
## BigGirlGottaEatToo	FALSE	4	0.0	0.0011286682	2.394208e-02
## TheIrishWhitexican	FALSE	2	0.0	0.0011286682	1.197104e-02
## Lysol3435	FALSE	2	0.0	0.0011286682	1.197104e-02
## Objective_College449	FALSE	1	0.0	0.0011286682	5.985520e-03
## RestartingMyLife0918	FALSE	1	0.0	0.0011286682	5.985520e-03
## m__a__s	FALSE	2	8217.0	0.0012195122	6.008973e-03
## Grogosh	FALSE	1	0.0	0.0011286682	5.985520e-03
## arcade2112	FALSE	2	0.0	0.0011286682	1.197104e-02
## mjsisko	FALSE	1	0.0	0.0011286682	5.985520e-03
## Specialist_Reason_27	FALSE	1	0.0	0.0011286682	5.985520e-03
## Idiotology101	FALSE	1	0.0	0.0011286682	5.985520e-03
## 20thcenturyman	FALSE	1	0.0	0.0011286682	5.985520e-03
## Veroonzebeach	FALSE	1	0.0	0.0011286682	5.985520e-03
## Jhawk2k	FALSE	2	0.0	0.0011286682	1.197104e-02
## McDuchess	FALSE	1	0.0	0.0011286682	5.985520e-03
## Greenhoused	FALSE	2	0.0	0.0011286682	1.197104e-02
## seriouslyFUCKthatdud	FALSE	2	0.0	0.0011286682	1.197104e-02
## Spelare_en	FALSE	1	0.0	0.0011286682	5.985520e-03
## wataworldtochange	FALSE	2	0.0	0.0011286682	1.197104e-02
## ferox965	FALSE	1	0.0	0.0011286682	5.985520e-03
## Jrsully92	FALSE	1	0.0	0.0011286682	5.985520e-03
## LouSputhole94	FALSE	1	0.0	0.0011286682	5.985520e-03
## groovy_giraffe	FALSE	1	0.0	0.0011286682	5.985520e-03
## techmaster242	FALSE	2	0.0	0.0011286682	1.197104e-02
## woahgeez_	FALSE	2	0.0	0.0011286682	1.197104e-02
## ContraMann	FALSE	3	0.0	0.0011286682	1.795656e-02
## TheSocialDynamicist	FALSE	1	0.0	0.0011286682	5.985520e-03
## blonderaider21	FALSE	1	0.0	0.0011286682	5.985520e-03

## -RUNPMT-	FALSE	1	0.0	0.0011286682	5.985520e-03
## More_Farm_7442	FALSE	1	0.0	0.0011286682	5.985520e-03
## JectorDelan	FALSE	2	0.0	0.0011286682	1.197104e-02
## lejoo	FALSE	1	0.0	0.0011286682	5.985520e-03
## fiesta-pantalones	FALSE	1	0.0	0.0011286682	5.985520e-03
## MrPwndabear	FALSE	1	0.0	0.0011286682	5.985520e-03
## Yarusenai	FALSE	1	0.0	0.0011286682	5.985520e-03
## paperpenises	FALSE	2	0.0	0.0011286682	1.197104e-02
## ZerexTheCool	FALSE	1	0.0	0.0011286682	5.985520e-03
## Individual_Fox_2950	FALSE	2	0.0	0.0011286682	1.197104e-02
## jtf71	FALSE	2	0.0	0.0011286682	1.197104e-02
## Afabledhero1	FALSE	1	0.0	0.0011286682	5.985520e-03
## OddEscape2295	FALSE	3	0.0	0.0011286682	1.795656e-02
## Rickrickrickrickrick	FALSE	1	0.0	0.0011286682	5.985520e-03
## tsacian	FALSE	1	0.0	0.0011286682	5.985520e-03
## Utterlybored	FALSE	1	0.0	0.0011286682	5.985520e-03
## Guido900	FALSE	1	0.0	0.0011286682	5.985520e-03
## Daddy_Zephyr	FALSE	3	0.0	0.0011286682	1.795656e-02
## MaxAmsNL	FALSE	1	0.0	0.0011286682	5.985520e-03
## JMIL1991	FALSE	1	0.0	0.0011286682	5.985520e-03
## navin__johnson	FALSE	1	0.0	0.0011286682	5.985520e-03
## too-slow-2-go	FALSE	1	0.0	0.0011286682	5.985520e-03
## Thecovesboss	FALSE	3	0.0	0.0011286682	1.795656e-02
## arakoczy6	FALSE	2	0.0	0.0011286682	1.197104e-02
## Zebracorn42	FALSE	1	0.0	0.0011286682	5.985520e-03
## thatsnotwait	FALSE	2	0.0	0.0007587253	4.690659e-05
## bobface222	FALSE	1	0.0	0.0007587253	2.345330e-05
## FunkJunky7	FALSE	1	0.0	0.0007587253	2.345330e-05
## flywing1	FALSE	1	0.0	0.0007587253	2.345330e-05
## CaptainMagnets	FALSE	1	0.0	0.0007587253	2.345330e-05
## Raysireks0G987	FALSE	1	0.0	0.0007587253	2.345330e-05
## SnooApples3402	FALSE	1	0.0	0.0007587253	2.345330e-05
## Cannibaltruism	FALSE	1	0.0	0.0007587253	2.345330e-05
## InsuranceToTheRescue	FALSE	1	0.0	0.0007587253	2.345330e-05
## 2020BillyJoel	FALSE	1	0.0	0.0007587253	2.345330e-05
## Vengefuleight	FALSE	1	0.0	0.0007587253	2.345330e-05
## xResonate	FALSE	1	0.0	0.0007587253	2.345330e-05
## WantedToLurk	FALSE	1	0.0	0.0007587253	2.345330e-05
## IneaBlake	FALSE	1	0.0	0.0007587253	2.345330e-05
## aassee1212	FALSE	1	0.0	0.0007587253	2.345330e-05
## penguished	FALSE	1	0.0	0.0007587253	2.345330e-05
## DeadHeadSteve	FALSE	1	0.0	0.0007587253	2.345330e-05
## Bonewearry1	FALSE	1	0.0	0.0007587253	2.345330e-05
## MikeySaysIt	FALSE	1	0.0	0.0007587253	2.345330e-05
## FearedEffect	FALSE	2	0.0	0.0007587253	4.690659e-05
## UnitGhidorah	FALSE	1	0.0	0.0007587253	2.345330e-05
## PresidentMilley	FALSE	3	0.0	0.0007587253	7.035989e-05
## TheDude-Esquire	FALSE	1	0.0	0.0007587253	2.345330e-05
## happy-Accident82	FALSE	1	0.0	0.0007587253	2.345330e-05
## ADD-DDS	FALSE	1	0.0	0.0007587253	2.345330e-05
## thedoppio	FALSE	1	0.0	0.0007587253	2.345330e-05
## DirtWaterAir	FALSE	1	0.0	0.0007587253	2.345330e-05
## g00gsuks	FALSE	2	0.0	0.0007587253	4.690659e-05
## SteezyAs314	FALSE	1	0.0	0.0007587253	2.345330e-05

```
## Shank5ter          FALSE  1      0.0 0.0007587253 2.345330e-05
## LaunchedLifthill   FALSE  1      0.0 0.0007587253 2.345330e-05
## Sengman            FALSE  2      0.0 0.0007587253 4.690659e-05
```

```
V(g)$size <- igraph::degree(g)
V(g)$label.cex <- igraph::degree(g) ** 0.1
plot(g, layout = layout_with_graphopt)
```



*# I calculated all centrality, but degree is the simplest and most straightforward one, so I used it for
 # The degree for the women is the rates of participation: Number of events with which each actor is aff
 # The degree for the events is the size of events: Number of actors affiliated with each event. It is t*

```
# 5
# igraph::degree(g_post)
# # binary
# g_post_2 <- graph_from_adjacency_matrix(as.matrix((woman_matrix_prod>0)+0), mode = "undirected")
# igraph::degree(g_ww_2)
# 2-mode
igraph::degree(g)
```

```
##          Fuzzy_darkman          Dewahl1          harabajji
##          10              1              1
## AsianInvasion00      Gonads_of_Thor      papachef69
##          3              1              1
##          jeefray      jfenton9817      mbleslie
```

##	2	1	2
##	Budmanes	urbanlife78	scrandis
##	1	1	1
##	spodgod42	imstillfly	redRabbitRumrunner
##	1	1	2
##	TurbulentMiddle2970	yingyangyoung	whakea
##	1	1	1
##	Serious_Stage	MrFlags69	OurCowsAreBetter
##	2	1	1
##	velcroforeveryone	TodaysTomSawyer777	Vanguard-003
##	1	1	1
##	cummingj69	Diegobyte	JimCracksJokes
##	1	1	1
##	stirrednotshaken01	Pixilmon69420lololol	BennoWutzi1954
##	1	2	2
##	IceDragon13	wretch5150	BidenWontMoveLeft
##	1	1	10
##	banditx19	Initial-Tangerine	SyphiliticScaliaSayz
##	1	1	2
##	tomjoads	Doctor_Y000U	ikebuck16
##	3	1	1
##	gsfgf	CorndogFiddlesticks	FILTER_OUT_T_D
##	1	1	1
##	TheKevinShow	MidgetGalaxy	MrFrequentFlyer
##	1	1	1
##	jjwax	Shifter25	Hahaheheme3
##	1	2	1
##	kurisu7885	Smarawi	Opening-Resolution-4
##	2	1	1
##	INTHEMIDSTOFLIONS	silentravr	squeamish
##	1	1	1
##	Deceptiveideas	docwyoming	LiquidInkHiveMind
##	2	1	2
##	ominous_anonymous	TheCrimsonDagger	Kiyae1
##	1	1	1
##	samcrut	peerlessblue	AardvarkHoliday
##	1	2	1
##	Dicho83	8to24	pierfishmarket
##	1	1	1
##	TheSadSensei	Most_Character_7976	LogMeOutScotty
##	1	2	1
##	nikhilper	MrNiceBot	highlander666666
##	1	1	2
##	PrettiKinx	haunted-liver-1	TheBigPhilbowski
##	1	1	1
##	AlarmedMedium9969	southsidebrewer	Professional_Check_3
##	2	1	2
##	MagicalUnicornFart	Furryhare375	jezz555
##	1	1	1
##	Jerryep7	Background_Scene_949	siggy940
##	1	1	1
##	_Desolation_-_Row_	gaminromanian	trisul-108
##	1	1	1
##	tjt169	katherinezetajones	ninjas_in_my_pants

##	1	1	1
##	The3DMan	SlowSecurity9673	1890s-babe
##	1	1	1
##	HopingToBeHeard	BCHK	Technical_Golf_6890
##	1	1	4
##	Cougardoodle	0-Furry-1	Whiskeyjack1234
##	4	1	2
##	hucklebutter	Ambitious_Pie_9202	slim_scsi
##	1	1	2
##	manhatim	ProbablyMatt_Stone_	Bruised_Penguin
##	1	2	2
##	tylanol7	BetterHouse	examine8
##	1	1	3
##	PresentOne2021	Cambronian717	recalcitrantJester
##	2	1	2
##	mattoleriver	fingerscrossedcoup	Aacron
##	1	1	2
##	Long_Before_Sunrise	goosejail	GraniteArrow
##	2	1	2
##	raysma	workerbee77	A_Naany_Mousse
##	1	3	1
##	HorseFightingLeague	JunkYardDog31	B1GFanOSU
##	2	2	1
##	Wayelder	demonj00	jcarter315
##	1	2	1
##	Mr_HandSmall	SnatchAddict	do_you_even_ship_bro
##	1	1	1
##	greevous00	WolvesInSpaceMarines	backstreets_back_ok
##	1	1	1
##	fromtrialswisdom	Maroon5five	oviporus
##	3	2	2
##	Torgosassistant2021	atpcaptain	PapaGeorgio19
##	1	1	1
##	BookerDeWitt1002	Sargonnax	F_han
##	1	1	1
##	Morgen019	monstersammich	Skullkidmusic
##	1	1	1
##	yourlocalmilkyman	AntonChigur187	Antishill_Artillery
##	2	1	1
##	youcantexterminateme	Dildo_McBaggins	sparty212
##	1	1	1
##	Hijax918	SaltCow4298	GreggHawthorne
##	1	1	2
##	RareBeautyEtsy	saintdudegaming	obeecanabee
##	1	1	3
##	DuncanAndFriends	06boostedgoat	Hi4Decades
##	1	2	1
##	Hotmatt2021	DRHaze82	Mouthshitter
##	1	2	1
##	Chaotic-Catastrophe	Mary_Dont_U_wanna	Jackers83
##	2	1	2
##	rxsl0is	LillyPip	Eiffel-Tower777
##	1	2	1
##	PatienceSmooth5175	never-ending_scream	panascope

##	1	2	1
##	Educational-Tie9809	GrandeRonde	oscartrudy1
##	2	2	2
##	Commercial-Love-1989	pixelburger	BronwynFields
##	1	1	1
##	crgresham	Macchillerr	UmptyscopeInVegas
##	1	3	1
##	RealisticDependent26	ahhhbiscuits	username18379
##	1	1	2
##	Mangar1	FletchLives1980	TheOxygenius
##	2	2	2
##	SpecterHEurope	NewAd6360	Foxeslike2play
##	2	2	2
##	bobbi21	APsWhoopinRoom	Crafty-Spot4523
##	1	1	1
##	quietfight	skipperscruise	BigGirlGottaEatToo
##	2	3	4
##	TheIrishWhitexican	Lysol3435	Objective_College449
##	2	2	1
##	RestartingMyLife0918	m__a__s	Grogosh
##	1	2	1
##	arcade2112	mjsisko	Specialist_Reason_27
##	2	1	1
##	Idiotology101	20thcenturyman	Veroonzebeach
##	1	1	1
##	Jhawk2k	McDuchess	Greenhoused
##	2	1	2
##	seriouslyFUCKthatdud	Spelare_en	wataworldtochange
##	2	1	2
##	ferox965	Jrsully92	LouSputhole94
##	1	1	1
##	groovy_giraffe	techmaster242	woahgeez_
##	1	2	2
##	ContraMann	TheSocialDynamicist	blonderaider21
##	3	1	1
##	-RUNPMT-	More_Farm_7442	JectorDelan
##	1	1	2
##	lejoo	fiesta-pantalones	MrPwndabear
##	1	1	1
##	Yarusenai	paperpenises	ZerexTheCool
##	1	2	1
##	Individual_Fox_2950	jtf71	Afabledhero1
##	2	2	1
##	OddEscape2295	Rickrickrickrickrick	tsacian
##	3	1	1
##	Utterlybored	Guido900	Daddy_Zephyr
##	1	1	3
##	MaxAmsNL	JMIL1991	navin__johnson
##	1	1	1
##	too-slow-2-go	Thecovesboss	arakoczy6
##	1	3	2
##	Zebracorn42	thatsnotwait	bobface222
##	1	2	1
##	FunkJunky7	flywing1	CaptainMagnets

##	1	1	1
##	RaysireksOG987	SnooApples3402	Cannibaltruism
##	1	1	1
##	InsuranceToTheRescue	2020BillyJoel	Vengefuleight
##	1	1	1
##	xResonate	WantedToLurk	IneaBlake
##	1	1	1
##	aassee1212	penguished	DeadHeadSteve
##	1	1	1
##	Boneweary1	MikeySaysIt	FearedEffect
##	1	1	2
##	UnitGhidorah	PresidentMilley	TheDude-Esquire
##	1	3	1
##	happy-Accident82	ADD-DDS	thedoppio
##	1	1	1
##	DirtWaterAir	g00gsuks	SteezyAs314
##	1	2	1
##	Shank5ter	LaunchedLifthill	Sengman
##	1	1	2
##	t3_nk564e	t3_t2suj2	t3_t11uq0
##	96	96	169
##	t3_rxqvwi		
##	39		

The woman-to-woman matrix describes how many events in common any two women had, whose degree is the
The 2-mode matrix represents any events an actor had participated in, and the degree represents the c

6

Since we care about the overall attendance, a larger event will have more participants and hence each