

MapReduce

Classroom example

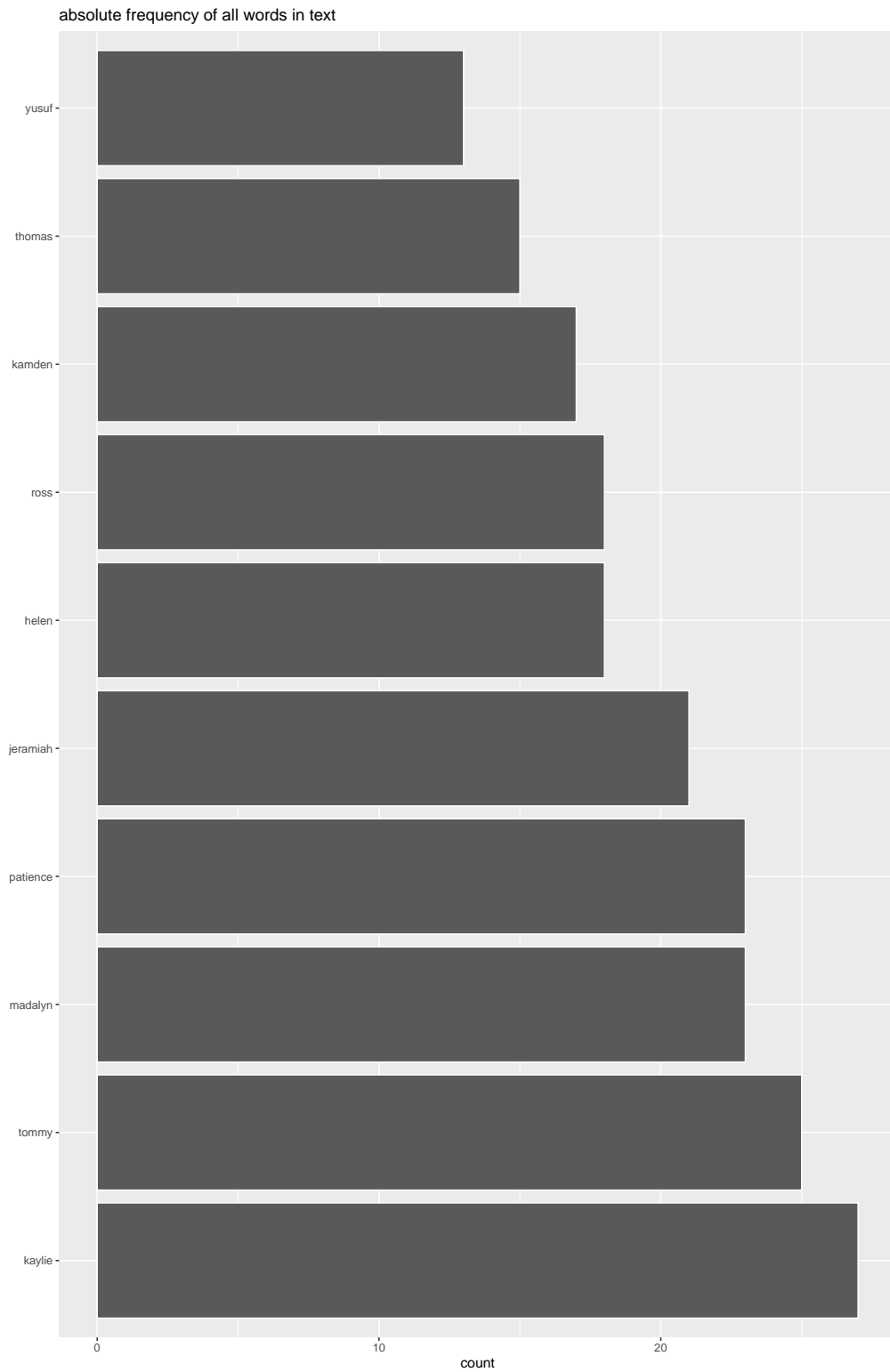
This is the file to create a map reduce classroom example. The setup is as follows

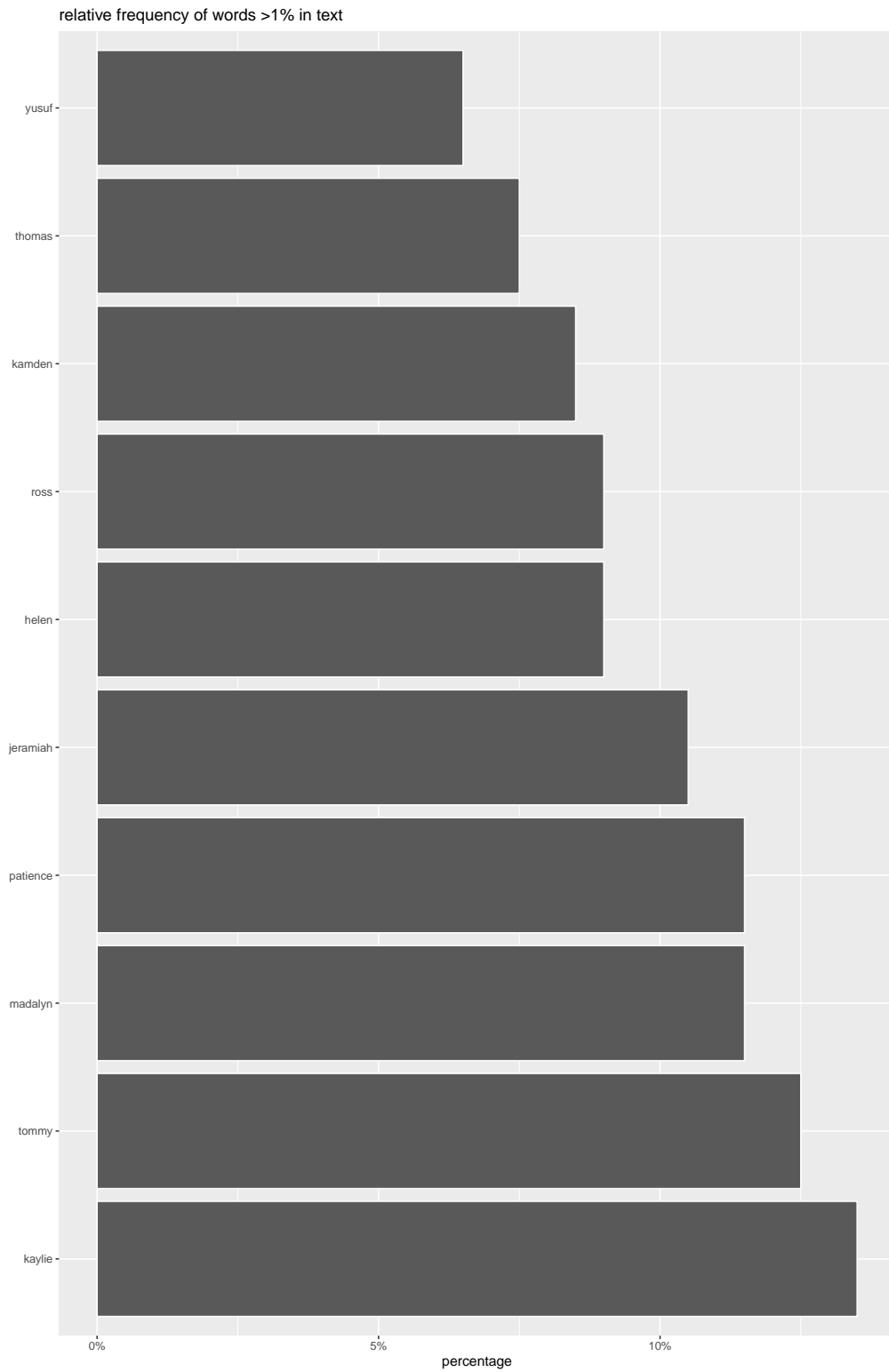
1. print this file
2. give the raw file to 1-4 students, they shall count the words. Measure the time. This is sequential processing.
3. give the chunked file to the respective number of students. There are $n = 2, 4, 5, 10$ groups available. The number of students is the chunk server.
4. one student acts as the “reduce” server, collecting all the counts.
5. write the counts on the whiteboard including the times
6. which number of groups is the most efficient and which produces considerable overhead?

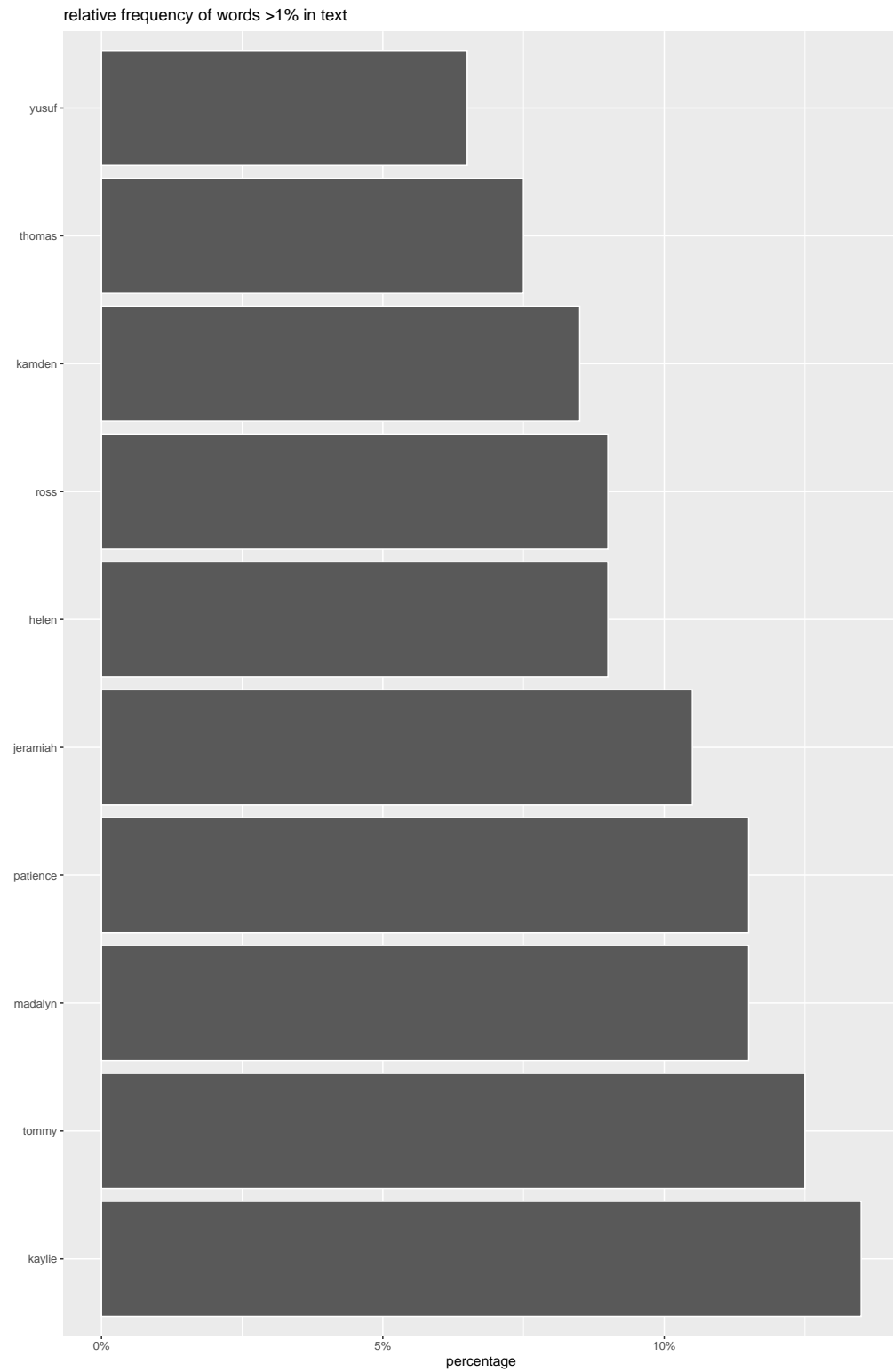
some summary statistics on the raw data

In total there are 200 words available.

words	Freq	percentage	percentage_round
kaylie	27	13.50%	13.50%
tommy	25	12.50%	12.50%
madalyn	23	11.50%	11.50%
patience	23	11.50%	11.50%
jeramiah	21	10.50%	10.50%
helen	18	9.00%	9.00%
ross	18	9.00%	9.00%
kamden	17	8.50%	8.50%
thomas	15	7.50%	7.50%
yusuf	13	6.50%	6.50%







The Raw data 01

Kaylie, Madalyn, Tommy, Madalyn, Kaylie, Kaylie, Madalyn, Tommy, Kaylie, Kaylie, Kaylie, Madalyn, Kaylie, Ross , Patience, Patience, Ross , Thomas, Tommy, Jeramiah, Ross , Ross , Patience, Tommy, Ross , Helen, Kamden, Tommy, Kaylie, Patience, Kaylie, Ross , Patience, Kamden, Thomas, Tommy, Kamden, Patience, Kaylie, Thomas, Tommy, Patience, Helen, Ross , Kamden, Ross , Kaylie, Jeramiah, Patience, Ross , Patience, Kamden, Yusuf, Thomas, Kamden, Kamden, Helen, Madalyn, Kaylie, Patience, Yusuf, Tommy, Tommy, Madalyn, Ross , Madalyn, Patience, Tommy, Jeramiah, Yusuf, Jeramiah, Kaylie, Tommy, Helen, Helen, Thomas, Jeramiah, Thomas, Helen, Tommy, Tommy, Patience, Thomas, Ross , Jeramiah, Jeramiah, Madalyn, Madalyn, Ross , Patience, Kaylie, Madalyn, Helen, Kaylie, Jeramiah, Yusuf, Helen, Kaylie, Kamden, Thomas, Kaylie, Kaylie, Jeramiah, Tommy, Ross , Kaylie, Helen, Madalyn, Kamden, Madalyn, Jeramiah, Tommy, Madalyn, Jeramiah, Madalyn, Thomas, Thomas, Jeramiah, Kaylie, Ross , Patience, Patience, Jeramiah, Tommy, Yusuf, Yusuf, Tommy, Tommy, Jeramiah, Helen, Thomas, Helen, Ross , Tommy, Kaylie, Helen, Kaylie, Kaylie, Madalyn, Kamden, Patience, Patience, Tommy, Helen, Jeramiah, Helen, Kamden, Patience, Kaylie, Madalyn, Kaylie, Madalyn, Patience, Helen, Madalyn, Kamden, Yusuf, Patience, Madalyn, Helen, Jeramiah, Yusuf, Patience, Kamden, Tommy, Tommy, Yusuf, Kaylie, Madalyn, Madalyn, Thomas, Kamden, Jeramiah, Yusuf, Thomas, Jeramiah, Tommy, Kamden, Thomas, Tommy, Kamden, Jeramiah, Kaylie, Madalyn, Ross , Helen, Patience, Yusuf, Tommy, Helen, Kamden, Jeramiah, Patience, Jeramiah, Ross , Yusuf, Thomas, Yusuf, Ross , Madalyn

The Raw data 02

Kaylie, Madalyn, Tommy, Madalyn, Kaylie, Kaylie, Madalyn, Tommy, Kaylie, Kaylie, Kaylie, Madalyn, Kaylie, Ross , Patience, Patience, Ross , Thomas, Tommy, Jeramiah, Ross , Ross , Patience, Tommy, Ross , Helen, Kamden, Tommy, Kaylie, Patience, Kaylie, Ross , Patience, Kamden, Thomas, Tommy, Kamden, Patience, Kaylie, Thomas, Tommy, Patience, Helen, Ross , Kamden, Ross , Kaylie, Jeramiah, Patience, Ross , Patience, Kamden, Yusuf, Thomas, Kamden, Kamden, Helen, Madalyn, Kaylie, Patience, Yusuf, Tommy, Tommy, Madalyn, Ross , Madalyn, Patience, Tommy, Jeramiah, Yusuf, Jeramiah, Kaylie, Tommy, Helen, Helen, Thomas, Jeramiah, Thomas, Helen, Tommy, Tommy, Patience, Thomas, Ross , Jeramiah, Jeramiah, Madalyn, Madalyn, Ross , Patience, Kaylie, Madalyn, Helen, Kaylie, Jeramiah, Yusuf, Helen, Kaylie, Kamden, Thomas, Kaylie, Kaylie, Jeramiah, Tommy, Ross , Kaylie, Helen, Madalyn, Kamden, Madalyn, Jeramiah, Tommy, Madalyn, Jeramiah, Madalyn, Thomas, Thomas, Jeramiah, Kaylie, Ross , Patience, Patience, Jeramiah, Tommy, Yusuf, Yusuf, Tommy, Tommy, Jeramiah, Helen, Thomas, Helen, Ross , Tommy, Kaylie, Helen, Kaylie, Kaylie, Madalyn, Kamden, Patience, Patience, Tommy, Helen, Jeramiah, Helen, Kamden, Patience, Kaylie, Madalyn, Kaylie, Madalyn, Patience, Helen, Madalyn, Kamden, Yusuf, Patience, Madalyn, Helen, Jeramiah, Yusuf, Patience, Kamden, Tommy, Tommy, Yusuf, Kaylie, Madalyn, Madalyn, Thomas, Kamden, Jeramiah, Yusuf, Thomas, Jeramiah, Tommy, Kamden, Thomas, Tommy, Kamden, Jeramiah, Kaylie, Madalyn, Ross , Helen, Patience, Yusuf, Tommy, Helen, Kamden, Jeramiah, Patience, Jeramiah, Ross , Yusuf, Thomas, Yusuf, Ross , Madalyn

The Raw data 03

Kaylie, Madalyn, Tommy, Madalyn, Kaylie, Kaylie, Madalyn, Tommy, Kaylie, Kaylie, Kaylie, Madalyn, Kaylie, Ross , Patience, Patience, Ross , Thomas, Tommy, Jeramiah, Ross , Ross , Patience, Tommy, Ross , Helen, Kamden, Tommy, Kaylie, Patience, Kaylie, Ross , Patience, Kamden, Thomas, Tommy, Kamden, Patience, Kaylie, Thomas, Tommy, Patience, Helen, Ross , Kamden, Ross , Kaylie, Jeramiah, Patience, Ross , Patience, Kamden, Yusuf, Thomas, Kamden, Kamden, Helen, Madalyn, Kaylie, Patience, Yusuf, Tommy, Tommy, Madalyn, Ross , Madalyn, Patience, Tommy, Jeramiah, Yusuf, Jeramiah, Kaylie, Tommy, Helen, Helen, Thomas, Jeramiah, Thomas, Helen, Tommy, Tommy, Patience, Thomas, Ross , Jeramiah, Jeramiah, Madalyn, Madalyn, Ross , Patience, Kaylie, Madalyn, Helen, Kaylie, Jeramiah, Yusuf, Helen, Kaylie, Kamden, Thomas, Kaylie, Kaylie, Jeramiah, Tommy, Ross , Kaylie, Helen, Madalyn, Kamden, Madalyn, Jeramiah, Tommy, Madalyn, Jeramiah, Madalyn, Thomas, Thomas, Jeramiah, Kaylie, Ross , Patience, Patience, Jeramiah, Tommy, Yusuf, Yusuf, Tommy, Tommy, Jeramiah, Helen, Thomas, Helen, Ross , Tommy, Kaylie, Helen, Kaylie, Kaylie, Madalyn, Kamden, Patience, Patience, Tommy, Helen, Jeramiah, Helen, Kamden, Patience, Kaylie, Madalyn, Kaylie, Madalyn, Patience, Helen, Madalyn, Kamden, Yusuf, Patience, Madalyn, Helen, Jeramiah, Yusuf, Patience, Kamden, Tommy, Tommy, Yusuf, Kaylie, Madalyn, Madalyn, Thomas, Kamden, Jeramiah, Yusuf, Thomas, Jeramiah, Tommy, Kamden, Thomas, Tommy, Kamden, Jeramiah, Kaylie, Madalyn, Ross , Helen, Patience, Yusuf, Tommy, Helen, Kamden, Jeramiah, Patience, Jeramiah, Ross , Yusuf, Thomas, Yusuf, Ross , Madalyn

The Raw data 04

Kaylie, Madalyn, Tommy, Madalyn, Kaylie, Kaylie, Madalyn, Tommy, Kaylie, Kaylie, Kaylie, Madalyn, Kaylie, Ross , Patience, Patience, Ross , Thomas, Tommy, Jeramiah, Ross , Ross , Patience, Tommy, Ross , Helen, Kamden, Tommy, Kaylie, Patience, Kaylie, Ross , Patience, Kamden, Thomas, Tommy, Kamden, Patience, Kaylie, Thomas, Tommy, Patience, Helen, Ross , Kamden, Ross , Kaylie, Jeramiah, Patience, Ross , Patience, Kamden, Yusuf, Thomas, Kamden, Kamden, Helen, Madalyn, Kaylie, Patience, Yusuf, Tommy, Tommy, Madalyn, Ross , Madalyn, Patience, Tommy, Jeramiah, Yusuf, Jeramiah, Kaylie, Tommy, Helen, Helen, Thomas, Jeramiah, Thomas, Helen, Tommy, Tommy, Patience, Thomas, Ross , Jeramiah, Jeramiah, Madalyn, Madalyn, Ross , Patience, Kaylie, Madalyn, Helen, Kaylie, Jeramiah, Yusuf, Helen, Kaylie, Kamden, Thomas, Kaylie, Kaylie, Jeramiah, Tommy, Ross , Kaylie, Helen, Madalyn, Kamden, Madalyn, Jeramiah, Tommy, Madalyn, Jeramiah, Madalyn, Thomas, Thomas, Jeramiah, Kaylie, Ross , Patience, Patience, Jeramiah, Tommy, Yusuf, Yusuf, Tommy, Tommy, Jeramiah, Helen, Thomas, Helen, Ross , Tommy, Kaylie, Helen, Kaylie, Kaylie, Madalyn, Kamden, Patience, Patience, Tommy, Helen, Jeramiah, Helen, Kamden, Patience, Kaylie, Madalyn, Kaylie, Madalyn, Patience, Helen, Madalyn, Kamden, Yusuf, Patience, Madalyn, Helen, Jeramiah, Yusuf, Patience, Kamden, Tommy, Tommy, Yusuf, Kaylie, Madalyn, Madalyn, Thomas, Kamden, Jeramiah, Yusuf, Thomas, Jeramiah, Tommy, Kamden, Thomas, Tommy, Kamden, Jeramiah, Kaylie, Madalyn, Ross , Helen, Patience, Yusuf, Tommy, Helen, Kamden, Jeramiah, Patience, Jeramiah, Ross , Yusuf, Thomas, Yusuf, Ross , Madalyn

Two Groups

Part 1 of 2 (100 words)

kaylie tommy kaylie madalyn kaylie kaylie kaylie patience ross tommy ross patience ross kamden kaylie kaylie patience thomas kamden kaylie tommy helen kamden kaylie patience patience yusuf kamden helen kaylie yusuf tommy ross patience jeramiah jeramiah tommy helen jeramiah helen tommy thomas jeramiah madalyn ross kaylie helen jeramiah helen kamden kaylie jeramiah ross helen kamden jeramiah madalyn madalyn thomas kaylie patience jeramiah yusuf tommy jeramiah thomas ross kaylie kaylie madalyn patience tommy jeramiah kamden kaylie kaylie patience madalyn yusuf madalyn jeramiah patience tommy yusuf madalyn thomas jeramiah thomas tommy thomas kamden kaylie ross patience tommy kamden patience ross thomas ross

Part 2 of 2 (100 words)

madalyn madalyn kaylie tommy kaylie madalyn ross patience thomas jeramiah ross tommy
helen tommy patience ross kamden tommy patience thomas patience ross ross jeramiah ross
kamden thomas kamden madalyn patience tommy madalyn madalyn tommy yusuf kaylie helen
thomas thomas tommy patience ross jeramiah madalyn patience madalyn kaylie yusuf kaylie
thomas kaylie tommy kaylie madalyn madalyn tommy jeramiah thomas jeramiah ross patience
tommy yusuf tommy helen helen tommy helen kaylie kamden patience helen helen patience
madalyn madalyn helen kamden patience helen yusuf kamden tommy kaylie madalyn kamden
yusuf jeramiah kamden tommy jeramiah madalyn helen yusuf helen jeramiah jeramiah yusuf
yusuf madalyn

Four Groups

Part 1 of 4 (50 words)

kaylie kaylie kaylie kaylie ross ross ross kaylie patience kamden tommy kamden patience yusuf
helen yusuf ross jeramiah tommy jeramiah tommy jeramiah ross helen helen kaylie ross kamden
madalyn thomas patience yusuf jeramiah ross kaylie patience jeramiah kaylie patience yusuf
jeramiah tommy madalyn jeramiah tommy kamden ross tommy patience thomas

Part 2 of 4 (50 words)

madalyn kaylie kaylie ross thomas ross helen patience kamden patience patience ross ross
thomas madalyn tommy madalyn yusuf helen thomas patience jeramiah patience kaylie kaylie
kaylie kaylie madalyn jeramiah jeramiah patience yusuf helen tommy kaylie patience helen
madalyn helen patience yusuf tommy madalyn yusuf kamden jeramiah helen helen jeramiah
yusuf

Part 3 of 4 (50 words)

tommy madalyn kaylie patience tommy patience kamden kaylie thomas kaylie helen kaylie
patience kamden kaylie tommy patience jeramiah helen helen thomas madalyn kaylie jeramiah
kamden jeramiah helen jeramiah madalyn kaylie jeramiah tommy thomas kaylie madalyn
tommy kamden kaylie madalyn madalyn patience yusuf thomas thomas thomas kaylie patience
kamden ross ross

Part 4 of 4 (50 words)

madalyn tommy madalyn patience jeramiah tommy tommy ross tommy thomas ross jeramiah
kamden kamden patience madalyn tommy kaylie thomas tommy ross madalyn madalyn yusuf
thomas tommy madalyn tommy thomas ross tommy tommy helen helen kamden helen patience
madalyn kamden helen kamden kaylie kamden jeramiah tommy madalyn yusuf jeramiah yusuf
madalyn

Five Groups

Part 1 of 5 (40 words)

kaylie kaylie kaylie patience ross helen kaylie tommy tommy ross patience kamden yusuf
madalyn jeramiah thomas tommy jeramiah kaylie yusuf kaylie kaylie jeramiah thomas patience
yusuf thomas helen patience helen kaylie kamden jeramiah tommy thomas jeramiah kamden
helen kamden yusuf

Part 2 of 5 (40 words)

madalyn madalyn madalyn ross ross kamden ross kamden patience kaylie kamden helen tommy
patience kaylie jeramiah patience madalyn madalyn helen kaylie helen tommy thomas patience
tommy helen kaylie patience kamden madalyn yusuf yusuf yusuf kamden tommy jeramiah
patience jeramiah thomas

Part 3 of 5 (40 words)

tommy tommy kaylie thomas patience tommy patience patience helen jeramiah yusuf mada-
lyn tommy tommy tommy thomas thomas madalyn helen kaylie jeramiah madalyn mada-
lyn jeramiah jeramiah tommy ross kaylie tommy patience patience patience patience kaylie
jeramiah kamden kaylie yusuf patience yusuf

Part 4 of 5 (40 words)

madalyn kaylie ross tommy tommy kaylie kamden kaylie ross patience thomas kaylie madalyn
jeramiah helen helen ross ross kaylie kamden tommy kamden jeramiah kaylie tommy jeramiah
tommy madalyn helen kaylie helen madalyn kamden madalyn yusuf thomas madalyn tommy
jeramiah ross

Part 5 of 5 (40 words)

kaylie kaylie patience jeramiah ross patience thomas thomas kamden ross kamden patience
ross yusuf helen tommy jeramiah patience jeramiah thomas ross madalyn madalyn ross yusuf
helen kaylie kamden jeramiah madalyn madalyn helen tommy madalyn thomas tommy ross
helen ross madalyn

Ten Groups

Part 1 of 10 (20 words)

kaylie kaylie ross kaylie tommy patience yusuf jeramiah tommy kaylie kaylie jeramiah patience
thomas patience kaylie jeramiah thomas kamden kamden

Part 2 of 10 (20 words)

madalyn madalyn ross ross patience kamden tommy kaylie patience madalyn kaylie tommy
patience helen patience madalyn yusuf kamden jeramiah jeramiah

Part 3 of 10 (20 words)

tommy kaylie patience patience helen yusuf tommy tommy thomas helen jeramiah madalyn
jeramiah ross tommy patience patience jeramiah kaylie patience

Part 4 of 10 (20 words)

madalyn ross tommy kamden ross thomas madalyn helen ross kaylie tommy jeramiah tommy
tommy helen helen kamden yusuf madalyn jeramiah

Part 5 of 10 (20 words)

kaylie patience ross thomas kamden kamden ross helen jeramiah jeramiah ross madalyn yusuf
kaylie jeramiah madalyn tommy thomas ross ross

Part 6 of 10 (20 words)

kaylie patience helen tommy ross kamden madalyn thomas jeramiah yusuf kaylie thomas yusuf
helen helen kamden tommy jeramiah helen yusuf

Part 7 of 10 (20 words)

madalyn ross kamden kamden kaylie helen patience jeramiah madalyn helen helen thomas
tommy kaylie kamden yusuf yusuf tommy patience thomas

Part 8 of 10 (20 words)

tommy thomas tommy patience jeramiah madalyn tommy thomas madalyn kaylie madalyn
jeramiah tommy kaylie patience patience kaylie kamden yusuf yusuf

Part 9 of 10 (20 words)

kaylie tommy kaylie kaylie patience kaylie jeramiah helen ross kamden kamden kaylie jeramiah
madalyn kaylie madalyn madalyn thomas tommy ross

Part 10 of 10 (20 words)

kaylie jeramiah patience thomas ross patience yusuf tommy patience thomas madalyn ross
helen kamden madalyn helen madalyn tommy helen madalyn

Twenty Groups

Part 1 of 20 (10 words)

kaylie ross tommy yusuf tommy kaylie patience patience jeramiah kamden

Part 2 of 20 (10 words)

madalyn ross patience tommy patience kaylie patience patience yusuf jeramiah

Part 3 of 20 (10 words)

tommy patience helen tommy thomas jeramiah jeramiah tommy patience kaylie

Part 4 of 20 (10 words)

madalyn tommy ross madalyn ross tommy tommy helen kamden madalyn

Part 5 of 20 (10 words)

kaylie ross kamden ross jeramiah ross yusuf jeramiah tommy ross

Part 6 of 20 (10 words)

kaylie helen ross madalyn jeramiah kaylie yusuf helen tommy helen

Part 7 of 20 (10 words)

madalyn kamden kaylie patience madalyn helen tommy kamden yusuf patience

Part 8 of 20 (10 words)

tommy tommy jeramiah tommy madalyn madalyn tommy patience kaylie yusuf

Part 9 of 20 (10 words)

kaylie kaylie patience jeramiah ross kamden jeramiah kaylie madalyn tommy

Part 10 of 20 (10 words)

kaylie patience ross yusuf patience madalyn helen madalyn madalyn helen

Part 11 of 20 (10 words)

kaylie kaylie patience jeramiah kaylie jeramiah thomas kaylie thomas kamden

Part 12 of 20 (10 words)

madalyn ross kamden kaylie madalyn tommy helen madalyn kamden jeramiah

Part 13 of 20 (10 words)

kaylie patience yusuf tommy helen madalyn ross patience jeramiah patience

Part 14 of 20 (10 words)

ross kamden thomas helen kaylie jeramiah tommy helen yusuf jeramiah

Part 15 of 20 (10 words)

patience thomas kamden helen jeramiah madalyn kaylie madalyn thomas ross

Part 16 of 20 (10 words)

patience tommy kamden thomas yusuf thomas helen kamden jeramiah yusuf

Part 17 of 20 (10 words)

ross kamden helen jeramiah helen thomas kaylie yusuf tommy thomas

Part 18 of 20 (10 words)

thomas patience madalyn thomas kaylie jeramiah kaylie patience kamden yusuf

Part 19 of 20 (10 words)

tommy kaylie kaylie helen kamden kaylie madalyn madalyn thomas ross

Part 20 of 20 (10 words)

jeramiah thomas patience tommy thomas ross kamden helen tommy madalyn