

MapReduce

Classroom example

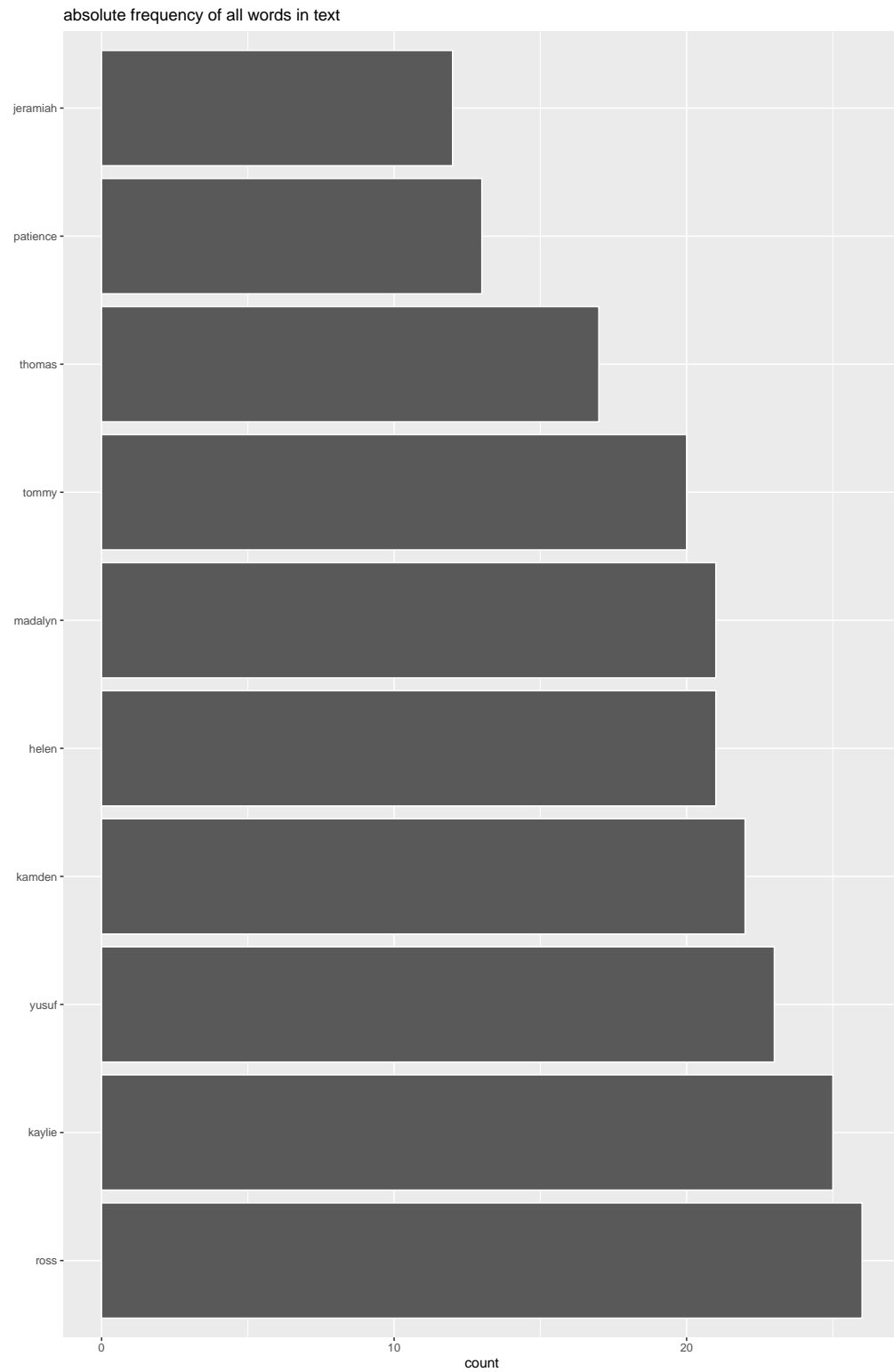
This is the file to create a map reduce classroom example. The setup is as follows

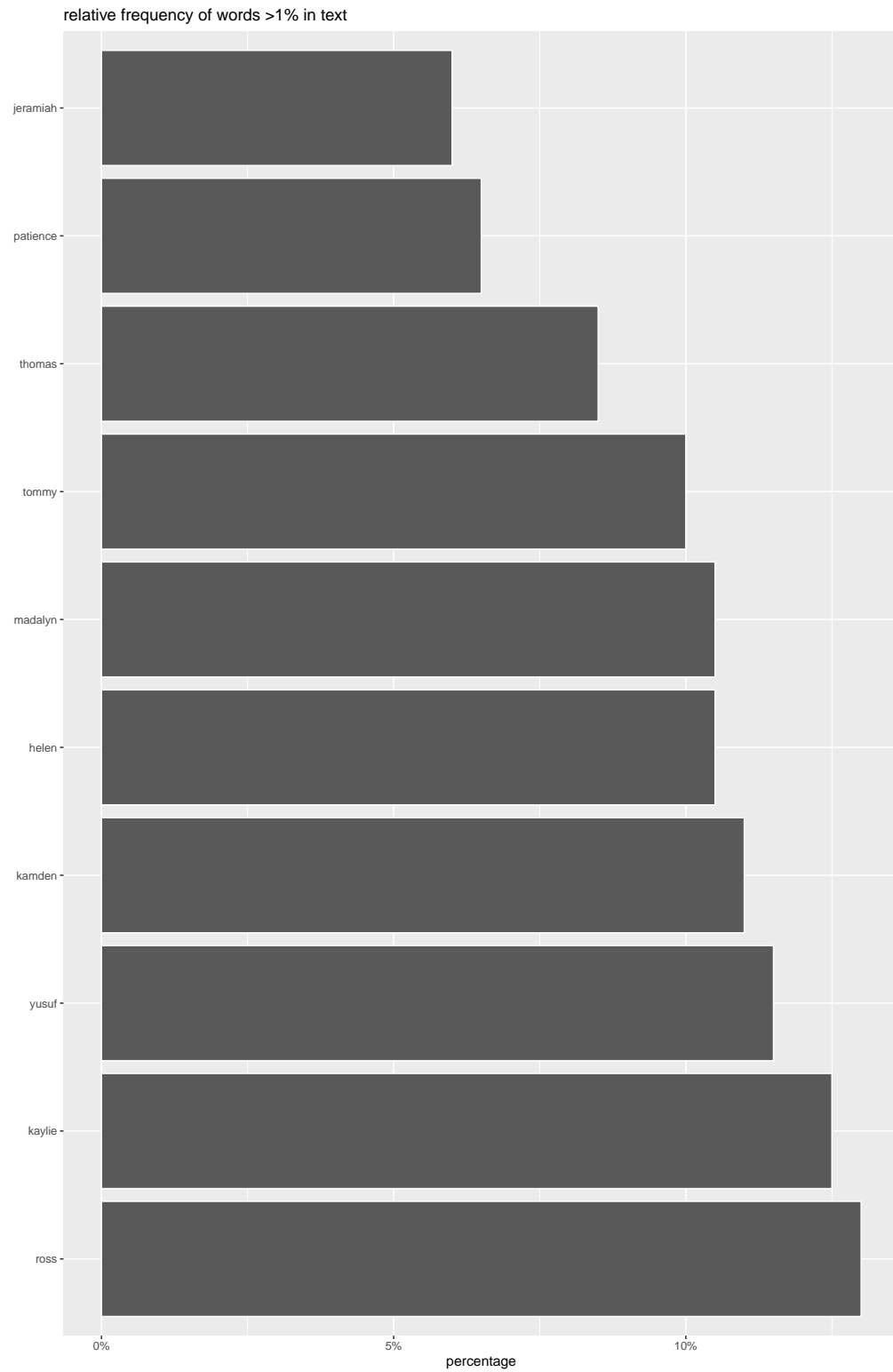
1. print this file
2. give the raw file to 1-4 students, they shall count the words. Measure the time. This is sequential processing.
3. give the chunked file to the respective number of students. There are $n = 2, 4, 5, 10$ groups available. The number of students is the chunk server.
4. one student 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?

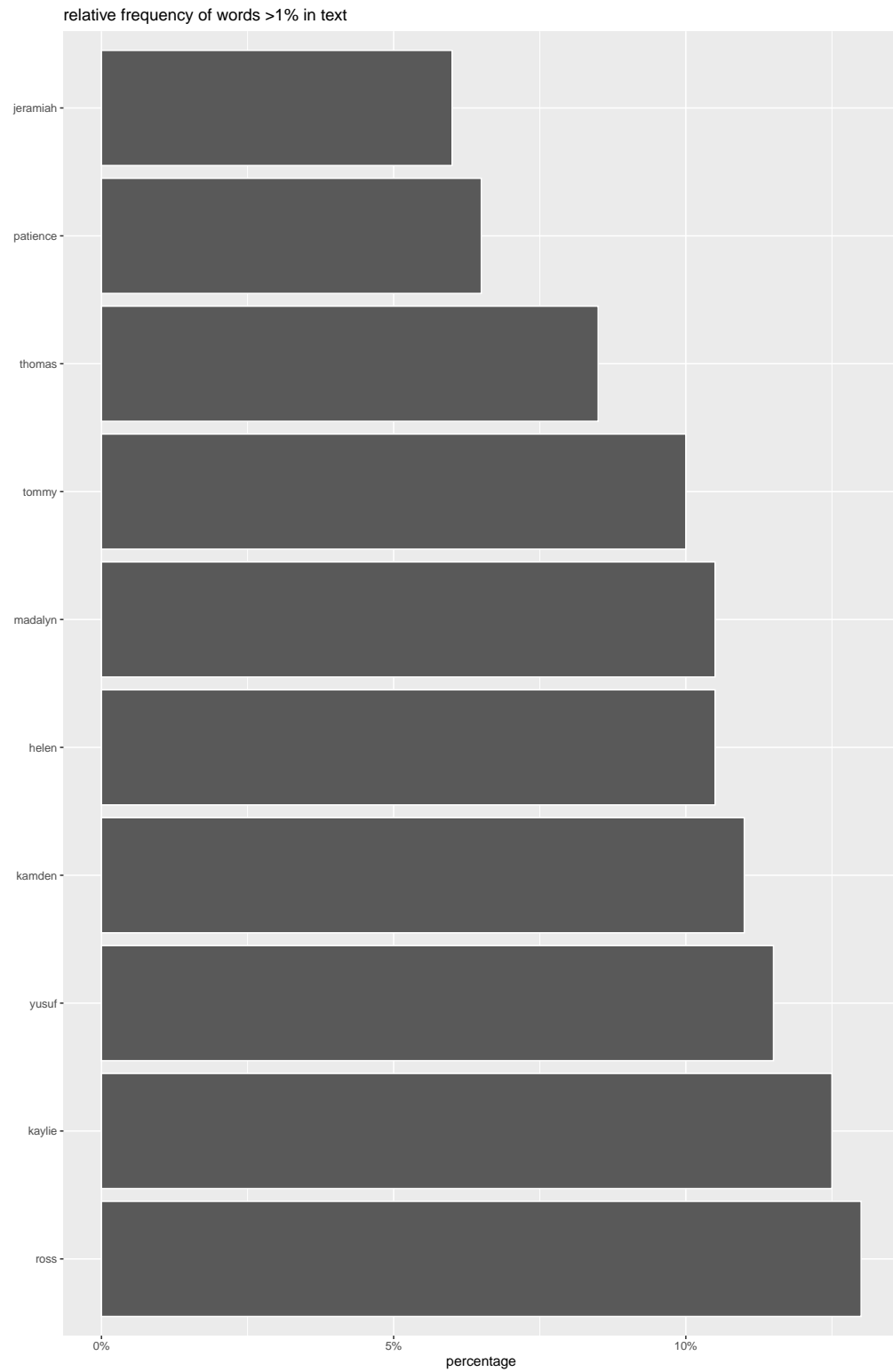
some summary statistics on the raw data

In total there are 200 words available.

words	Freq	percentage	percentage_round
ross	26	13.00%	13.00%
kaylie	25	12.50%	12.50%
yusuf	23	11.50%	11.50%
kamden	22	11.00%	11.00%
helen	21	10.50%	10.50%
madalyn	21	10.50%	10.50%
tommy	20	10.00%	10.00%
thomas	17	8.50%	8.50%
patience	13	6.50%	6.50%
jeremiah	12	6.00%	6.00%







The Raw data 01

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

The Raw data 02

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

The Raw data 03

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

The Raw data 04

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

Two Groups

Part 1 of 2 (100 words)

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

Part 2 of 2 (100 words)

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

Four Groups

Part 1 of 4 (50 words)

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

Part 2 of 4 (50 words)

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

Part 3 of 4 (50 words)

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

Part 4 of 4 (50 words)

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

Five Groups

Part 1 of 5 (40 words)

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

Part 2 of 5 (40 words)

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

Part 3 of 5 (40 words)

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

Part 4 of 5 (40 words)

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

Part 5 of 5 (40 words)

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

Ten Groups

Part 1 of 10 (20 words)

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

Part 2 of 10 (20 words)

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

Part 3 of 10 (20 words)

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

Part 4 of 10 (20 words)

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

Part 5 of 10 (20 words)

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

Part 6 of 10 (20 words)

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

Part 7 of 10 (20 words)

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

Part 8 of 10 (20 words)

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

Part 9 of 10 (20 words)

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

Part 10 of 10 (20 words)

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

Twenty Groups

Part 1 of 20 (10 words)

jeramiah helen patience kamden helen ross yusuf tommy kaylie patience

Part 2 of 20 (10 words)

thomas madalyn yusuf thomas thomas thomas kamden yusuf helen tommy

Part 3 of 20 (10 words)

kaylie yusuf kaylie jeramiah thomas ross tommy ross thomas patience

Part 4 of 20 (10 words)

kamden kamden jeramiah helen kaylie yusuf ross helen madalyn kaylie

Part 5 of 20 (10 words)

kaylie helen jeramiah kaylie yusuf patience patience kamden kaylie yusuf

Part 6 of 20 (10 words)

ross madalyn ross tommy yusuf kaylie kamden kamden kamden kamden

Part 7 of 20 (10 words)

helen madalyn thomas helen ross kamden ross madalyn kamden helen

Part 8 of 20 (10 words)

yusuf kamden ross ross kaylie tommy kaylie patience ross kamden

Part 9 of 20 (10 words)

jeramiah kamden tommy thomas thomas thomas helen yusuf madalyn madalyn

Part 10 of 20 (10 words)

tommy tommy tommy yusuf kaylie yusuf kaylie ross kamden tommy

Part 11 of 20 (10 words)

ross kamden tommy helen ross tommy helen thomas helen tommy

Part 12 of 20 (10 words)

kaylie ross kaylie tommy ross patience helen thomas madalyn madalyn

Part 13 of 20 (10 words)

yusuf yusuf kaylie jeramiah helen ross tommy kaylie helen yusuf

Part 14 of 20 (10 words)

jeramiah thomas yusuf tommy madalyn ross thomas yusuf patience madalyn

Part 15 of 20 (10 words)

helen jeramiah jeramiah patience patience madalyn tommy ross thomas ross

Part 16 of 20 (10 words)

jeramiah madalyn kaylie madalyn patience kamden ross madalyn jeramiah kaylie

Part 17 of 20 (10 words)

kamden ross yusuf helen patience madalyn ross tommy madalyn kaylie

Part 18 of 20 (10 words)

madalyn ross tommy thomas kaylie thomas kamden ross helen kamden

Part 19 of 20 (10 words)

yusuf helen kaylie kaylie ross patience kaylie yusuf kamden yusuf

Part 20 of 20 (10 words)

yusuf kaylie madalyn tommy madalyn jeramiah helen kamden madalyn yusuf