

# Let's Eavesdrop



The conversation that took place in a meeting is provided to you in the form of who spoke what, as it happened.

[Speaker1] I want the committee to consider changing ...

[Speaker2] I recommend that the committee ...

[Speaker3] We should try ...

[Speaker1] I would like to make another point ...

Find the frequency of the words (case-insensitive) that were spoken in the meeting. Report the  $k$  most spoken words in the meeting. If two or more words have the same frequency, such words should occur in lexicographical order.

Consider a word to be an alphanumeric string, with no special characters. For example: *rupesh@cse* contains two words – *rupesh* and *cse*. Speaker names are positive integers.

A leader, for a word, is a person who utters that word the most number of times. For each of the top  $k$  words, mention the leaders' ids. Please note that there can be more than one leader for a word. If there are multiple leaders for a word, their ids should occur in descending order.

Please use *functor* to order the speaker ids or the words, as required.

## Input Format

$N$   $k$  //  $N$  is the number of lines that follow

Speaker1 <sentence>

Speaker2 <sentence>

...

SpeakerM <sentence>

## Constraints

$$1 \leq N < \infty$$

$$1 \leq M < \infty$$

$$M \leq N$$

## Output Format

word1 leader1 leader2 ...

word2 leader1 leader2 ...

...

wordk leader1 leader2 ...

## Sample Input 0

```
4 2
1 Hi Jack. What are you doing?
2 Hi Mary. I am filling out a job application.
1 Are you finished with school already?
```

2 No. I have one more semester, but it would be great to have a job lined up.

## Sample Output 0

a 2  
are 1

## Sample Input 1

6 2  
1 Hey, what is your name?  
2 Hari. What is yours?  
1 Somu. Hey what food do you like?  
2 Dosa. What about you?  
1 Biryani. Hey wanna join for movie?  
2 Sorry, not now. Next time.

## Sample Output 1

what 2 1  
hey 1

## Sample Input 2

20 3  
1 AAT AAC GCT GCC GCA GCG  
2 CGT CGC CGA CGG AGA AGG  
3 GAT GAC  
4 TGT TGC  
5 GAA GAG  
3 CAA CAG  
4 GGT GGC GGA GGG  
5 CAT CAC  
2 ATT ATC ATA  
1 TTA TTG CTT CTC CTA CTG  
2 AAA AAG  
6 ATG  
1 TTT TTC  
4 CCT CCC CCA CCG  
5 TCT TCA TCG AGT AGC  
1 TAA TAG TGA  
6 ACT ACC ACA ACG  
2 TAT TAC  
4 TGG  
2 GTT GTC GTA GTG

## Sample Output 2

aaa 2  
aac 1  
aag 2

## Sample Input 3

13 4  
1 Hi, Helen. How is it going?  
2 Fine, thanks and you?  
1 Just fine. Where are you off to?  
2 To the library.  
1 I have got a history exam next week and need to start studying. Ugh.  
2 Well, I will see you later then. Good luck.  
1 Thanks. See you later.  
3 Thanks for meeting with me during your lunch hour. I appreciate it.  
4 No problem. I am happy to help. What is going on?  
3 Oh you know, the usual. Should I take this new job? Or do I stick with my current one?  
4 Well, I think it is time for a change. They pay you late and you are unhappy.  
3 Do you really think so?  
4 I know so. And I have been listening to you complain for over a year now. Trust me. Take the job. What do you have to lose?

### Sample Output 3

you 4  
i 4  
to 4  
and 4

### Sample Input 4

20 7  
1 What seems to be the problem?  
2 Well, I have a bad cough and a sore throat. I also have a headache.  
3 How long have you had these symptoms?  
2 About three days now. And I am really tired, too.  
1 Hmm. It sounds like you have got the flu. Take aspirin every four hours and get plenty of rest.  
3 Make sure you drink lots of fluids.  
1 Call me if you are still sick next week.  
2 OK, thanks.  
3 It is freezing outside. What happened to the weather report? I thought this cold front was supposed to pass.  
4 Yeah, I thought so too. That is what I read this morning.  
3 I guess the wind chill is really driving down the temperature.  
2 Can we go inside? I feel like my toes are starting to go numb.  
3 What did you say? Can you repeat that, please? Did you say to pick up ink for the printer? Sorry, the phone is cutting out.  
5 Can you hear me now? No, I need more computer paper. Listen, I will text you exactly what I need. Thanks, Luke. Talk to you later.  
3 Thanks, Stephanie. Sorry, my phone has really bad reception here.  
1 You always did have good taste. What a small world.  
2 Saturday is fine.  
4 Well, I like to do arts and crafts and drawing.  
3 Excellent idea. Let us do it.  
5 Absolutely. I am glad you are still an art fan too. Thank you for the invitation. It is always a pleasure to attend an arts event with you and learn something new.

### Sample Output 4

you 5  
i 5 2  
the 3  
to 3  
and 4 2  
is 3  
what 3 1

### Sample Input 5

30 37  
1 Your Highness, thank you for that speech. It was a great pleasure to listen to, and I think I feel, especially honored because there are hundreds of people here who would like to be asking you questions this afternoon, and I am the person who is sort of appointed to do so, and I am delighted and deeply honoured.  
2 Thank you very much.  
1 You ended with what is a remarkable theological foundation of pluralism. You began with the political situation of the world, and the multicultural situation of the Ismailis. So from all standards you have a basis for underlining pluralism as one of the most important issues in our world. But I think the theological understanding is one that may be new to many people who think primarily in terms of the practical issues of day to day life.  
2 Right, right. Well I think that is absolutely correct, and in fact this notion of one humanity in the faith of Islam is a very, very powerful force. But it is not always presented in the form that I tried to present it today. And it is there, it is clear for those who wish to see it and understand it, but not all Muslim societies take that on board.  
1 Well, it is interesting because Jewish, Christian and Muslim societies all are founded on theological principles that stress the oneness of God and also that begin with the theology of creation in the way in which you had. So there should be and I think there has been a kind of theological reaching out. I think especially of the Amman Declaration that you were part of, and of the message that was delivered called A Common Word Between Us and You, from so many Muslim leaders to Christian leaders across the country.  
2 I hope that is true. I have been watching in parts of the world that has become a thought process. I am fearful of the parts of the world where that is not part of let us say government philosophy, but I think that in time this understanding of unity of human society will end up by being seen as a condition sine qua non of good governance. I think you will see governments fail because they do not practice this principle. They will have so many divisions within them, so many attempts at achieving positions of power by certain groups or influence by others, that it will be impossible to create a sense of nationhood, a sense of building around common values, which after all is what most governments would wish to have.  
3 I think one of the most striking things about the writings you done on these issues and speeches like we heard today, is your relentless linking of issues of poverty and education and human development with the foundation of pluralism as you just articulated.  
2 Well, if you try to analyse the causes of poverty in the developing world, as we have tried, there is absolutely no doubt that the marginalisation of communities is one of the fundamental causes of this poverty. And this marginalisation is so structured in

society that minorities find it very difficult to break out of that situation. And the work that you are doing here in your field of pluralism, teaching about pluralism, having people understand that it is not a threat, on the contrary it is a foundation of civil society in the modern world. These things I think are absolutely essential. I think the more we have seen societies work, which are fractured, putting little groups of people in one box or another box, that is a way of guaranteeing conflict and poverty.

1 One of the things I think that we take from this, is because your Centre for Global Pluralism really looks at global issues which are so important, it also is the case that so much has changed in the United States and indeed in Canada and indeed at Harvard, since the days that you were in Leverett House with two secretaries, and that is the tremendous movement of people as migrants, as refugees from one part of the world to another, and in the US with the 1965 Immigration and Nationalities Act the opening of the US to immigrants really from all over the world, so that is really changed the face of Harvard, and the message that you bring is one that is very relevant to universities today. I not sure how large the Harvard Islamic Society was when you were here.

4 Well in fact, it did not exist I think until Sir Hamilton Gibb came to teach here at Harvard. My recollection is that he was the juried professor of Islamic Studies at Oxford if I am not wrong and he came to Harvard from Oxford and he started the program here at Harvard. But that is my recollection, that is a long time ago.

1 You know the thing that is amazing today, as you would walk around Harvard you would see dozens and dozens of women going just from here to Leverett House wearing hijab, that you would find a very active Islamic prayer space just next door, in one of the floors of the freshman dormitory and some places where the Juma prayers every week are in the largest lecture halls where they can remove all the chairs. So the transformation of our university from being a rather parochial university in some ways, to a global and cosmopolitan university is something that has not only to do with the fact that people come here from all over the world, but that our own nation has changed so much and these issues of marginalisation that you speak of, that are divisive in so many ways, are issues that that America faces profoundly in dealing with race and culture, and indeed with a multi religious society.

2 Well I am deeply pleased that Harvard has, is moving towards what Harvard wants to be, even when I graduated. And I remember President Bok telling me extensively about, how he was seeing Harvard becoming a global university rather than a US university. That was in his mind at the time, the goal for this university, and what you are saying today is that that goal is in the process of being achieved. So I have to say well, alhamdulillah.

2 Well it has been achieved but we have not really moved in some ways from what our current President Drew Faust calls the necessity of moving from diversity to belonging. To a sense of really creation of a community that is respectful of our differences, which are so many, and that move, I think one of the profound things that I hear you say time and again is that pluralism does not just happen by itself. It requires a certain amount of conviction and support of institutions across the spectrum of civil society.

2 I think that is absolutely right. And indeed I would encourage education on pluralism even in secondary education and in fact neuroscientists are saying that newly born children recognise the pluralism of other children being next to them in a cot even if they can see the child. So the individual, the human individual, has extraordinary means of sensing somebody who is from a different society. But that sensing has nothing negative in it. It is a constatation I can not find the word in English, but you know what I mean. So I find that very, very exciting that when children are born the notion of differences in background or race, is not at all a feature which has value attached to it, neither negative nor positive. It is a constatation.

1 That issue that you have raised again and again, that our differences are part of the richness that we bring to life, we could say from a theological standpoint that is a God given difference from scattering of people from this one soul.

2 But I have to nonetheless point out that many countries in the developing world where we have been working were governed on the principle of divide of communities. For years we worked in countries where the educational system was African, Asian or European. There was no single educational system in those countries. So that is the phenomenon which people have inherited even today and which is difficult to overcome. I can remember situations where hospitals were not entitled to take people of different backgrounds.

3 In the development network that you have created spanning the world, I know education is a very big piece of this, from the Aga Khan Universities to local education that must be a daunting task. A few years ago, your daughter Princess Zahra was here and spoke at the Harvard School of Education about her role in this with a great attention to women education. I am not sure if that is a particular emphasis that you bring, but it certainly is one that is profoundly important.

4 Well my grandfather in fact pushed very hard to have women education as part of our overall educational process, so that is part of the way we think, the way we live today. Now you were talking about universities etc. And it is clearly a critical issue that in the developing world, the universities should upgrade their performance and that their degrees should be recognised, that their research should be of global importance and I was taught when I came to Harvard that plagiarism was a bad thing, well I am here to plagiarise and I do not hide it from Harvard.

1 When you talk about the cosmopolitan ethic that emerges from this recognition of difference and yet a foundation in human oneness, the elements of that are what? What would you say are the elements of a cosmopolitan ethic?

4 I think the first of all you need to accept the premise that human society is pluralist, and it has been pluralist for as long as we know about the human race if I not wrong. So there is a basic premise that has to be accepted, that issue of accepting pluralism also means that you need to attach equity to that notion. If there is no equity in pluralist societies, then you do have functioning pluralist societies, you don't have institutions that function properly etc. And I have admired a number of governments in developing countries for example, where without saying it, they have fought very hard to create equal opportunity for various communities in various parts of the country, whereas that was not the case in colonial societies.

4 So equity would be one element of that ethic.

3 Equity would certainly be one element.

2 And a respect for justice would be another piece of it?

1 Respect for justice and I would say equal opportunity for the intelligentsia. I have seen situations where there has been an attempt to marginalise the intelligentsia of a given community and that of course is an extremely unwelcome feature of a society.

2 One of the things I recall from having been involved with interfaith leaders, not that I am one myself, but I an observer of these events, was the effort over a number of years ago, to create a global ethic, out of the distinctive ethical norms of different religious traditions and even of secular traditions and there were certain things everyone could agree on. And I think equality, justice, opportunity, dignity, etc. were very much agreeable. When it came to what equity meant, I hesitate to say the biggest issue in equity among these dignified religious leaders was the issue of women and men, and whether gender equity, whether that really meant gender equity. It seems to me that is an issue to a great extent and yet my own impression of the Ismaili community is that leadership in Jamatkhanas and other elements of the Development Network and leadership in these positions is shared by women and men. Am I right about that?

3 Absolutely, and in fact I have spent considerable time trying to make sure that whether it is leadership amongst women the community could benefit from that. Leadership qualities is not gender driven so actually, if you do respect the fact that both genders have competencies, outstanding capabilities, you are damaging your community by not appointing those people.

2 So as we think about, I am thinking now about the kind of responsibility that you have both for the spiritual as well the material well being, the welfare of the Ismaili community but as you put it, it is not just the welfare of the Ismaili community but those with whom they share their societies as well.

1 Absolutely.

3 So in those, are there societies in which you find it almost impossible to have leadership of women in your own community rise?

2 No, not really I think. I think people tolerate our decisions, I am not sure they are always welcome.

## Sample Output 5

the 2 1  
of 2  
that 2  
and 1  
is 2  
i 2  
in 2  
to 2  
a 2  
you 1  
it 2  
not 2  
so 1  
have 2  
think 2  
from 1  
are 1  
one 1  
as 2  
but 2  
was 2  
for 2 1  
harvard 4  
we 2  
be 4  
has 2 1  
this 2  
very 2  
well 2  
with 1  
world 2 1  
am 2  
people 2 1  
there 2 1  
would 1  
about 2  
pluralism 2

## Sample Input 6

20 18  
1 That seems to have struck a chord here.  
4 I think the women in the audience know what I mean.  
1 So as you think about your successor, is there any chance that Princess Zahra could, or would not that be tolerated.  
2 No that would not be tolerated.  
1 We were very impressed with her here. But we have not met your two sons.  
2 Well she is the first member of my family who received a University degree. So she is an important member of my family because the gender balance is all now Harvard related.  
1 One of the things that has been so, I am sure very much on people mind, is that to intentionally cultivate pluralism in a society, there are some societies in which the civil society and our educational institutions are welcoming of this. But of course, pluralism within our own religious communities is often a very difficult thing, and I speak as a Christian who knows perfectly well the number of anti pluralists there are within the Christian tradition and people who are convinced that the only possible way of conceptualising religious truth is through the lens of the Christian tradition. This also is probably true in the Muslim tradition and the effort that must be made to cultivate the kind of appreciation of mutual respect and difference is certainly a huge task.  
1 I would strongly agree that pluralism is a subject that is taught; it is not instinctive in a human society.  
2 It is not instinctive.  
1 It is not instinctive. So I would strongly support any initiative at any level of age that is from the newly born child up to the post graduate student, that there should be continuous exposure to the notion of pluralism in society. It much easier with children obviously than with grown ups. But to me, it must be a feature of any modern society in any part of the world. I can travel in any part of the world today, without observing the amazing mix of backgrounds of people today that was there years ago. And that is happening more and more through happy events, unhappy events you can see what is happening with refugees today. But I am more worried about societies preparing themselves to accept foreigners. That not a big story of success in my mind. The only country that I can think of that actually has a process is Canada.  
1 And you have lived certainly in France, and have deep connections in England as well. And you have seen the ways in which they are struggling with the diversity of their own societies.  
2 Absolutely and for different reasons, but they are struggling, and in many ways I consider them somewhat unprepared.  
3 I think the preparedness here in the United States is also very much, I mean the Pluralism Project has been studying the changing religious landscapes of the US for 25 years. And I think, along the lines of your point, if I had been teaching Kindergarten in Houston, Texas, I would have realised far earlier how much our society had been changing. But it was until till the 1990s that the children of this new immigration came to college and began transforming our own demographic and university in which we live and teach.  
2 Well I think that your point is very important, because what you are effectively saying is awareness in United States of the issue. I am thinking of countries where there has not been that awareness until much too late.  
1 Yes and among some Americans as well, even though scarcely, you can really find a state in the US where the Muslim and Hindu and Sikh presence hasn become a significant one. But still, we hear this in some of our public leaders this is only a slow dawning awareness. They sometimes don like it, as well.

2 Yes, I realize that, but I mean I think these are people who are thinking against or in contradiction with a roadmap that you can extend from history and you extend that road map and you reach the correct conclusions.

1 You have often said, and I think it right, as we look at the world today that the instability and divisiveness of societies is infectious, and at the same time you say so is hope. So can you give us in conclusion just a sense of the infectiousness of hope from your experience.

2 Well, I think I mentioned in my comments, to me one of the most important issues for society in any part of the world, is that it should be driven by hope. The moment that people of any generation, of any age, lose hope, it is a very, very damaging thing for that community, that society. So creating circumstances of hope, is to me very, very important indeed. And much of the Aga Khan Development Network their work is to try to assist countries to become countries of opportunity. That is one of the main goals that I have is that as many countries where the community is living should be countries of opportunity. Definition of opportunity of course is a different thing, but a life that sees itself with no opportunity is a very, very sad prospect.

3 Your Highness this has been a great pleasure to have the opportunity to speak with you and thank you for your return to Harvard for this afternoon. Thank you very much and may you come again and again.

2 Well thank you for your generosity and your questions.

## Sample Output 6

the 1  
of 1  
is 1  
that 1  
and 1  
i 2  
in 1  
a 1  
you 1  
to 1  
very 2  
it 1  
any 1  
are 1  
but 1  
have 1  
think 2 1  
your 3 2 1

## Sample Input 7

44 10  
1 The ides of March are come.  
2 Ay, Caesar, but not gone.  
3 Hail, Caesar, read this schedule.  
4 Trebonius doth desire you to read, at your best leisure, this his humble suit.  
3 O Caesar, read mine first, for mine is a suit that touches Caesar nearer, read it, great Caesar.  
1 What touches us ourself shall be last served.  
3 Delay not, Caesar, read it instantly.  
1 What, is the fellow mad?  
5 Sirrah, give place.  
6 What, urge you your petitions in the street? Come to the Capitol.  
7 I wish your enterprise today may thrive.  
6 What enterprise, Popilius?  
7 Fare you well.  
8 What said Popilius Lena?  
6 He wished today our enterprise might thrive. I fear our purpose is discovered.  
8 Look, how he makes to Caesar, mark him.  
6 Casca, be sudden, for we fear prevention. Brutus, what shall be done? If this be known, Cassius or Caesar never shall turn back, For I will slay myself.  
8 Cassius, be constant. Popilius Lena speaks not of our purposes, for, look, he smiles, and Caesar doth not change.  
6 Trebonius knows his time, for, look you, Brutus. He draws Mark Antony out of the way.  
9 Where is Metellus Cimber? Let him go, And presently prefer his suit to Caesar.  
8 He is addressed, press near and second him.  
3 Casca, you are the first that rears your hand.  
1 Are we all ready? What is now amiss That Caesar and his senate must redress?  
1 I must prevent thee, Cimber. These couchings and these lowly courtesies Might fire the blood of ordinary men, And turn preordnance and first decree Into the law of children. Be not fond, To think that Caesar bears such rebel blood That will be thaw'd from the true quality With that which melteth fools I mean, sweet words, Low crooked courtesies and base spaniel fawning.  
8 I kiss thy hand, but not in flattery, Caesar. Desiring thee that Publius Cimber may have an immediate freedom of repeal.  
1 What, Brutus.  
1 I could be well moved, if I were as you. If I could pray to move, prayers would move me. But I am constant as the northern star, Of whose true and resting quality There is no fellow in the firmament. The skies are painted with unnumbered sparks, They are all fire and every one doth shine, But there is but one in all doth hold his place.  
1 Doth not Brutus bootless kneel?  
4 Speak, hands for me!  
1 Et tu, Brute. Then fall, Caesar.  
5 Liberty, Freedom, Tyranny is dead. Run hence, proclaim, cry it about the streets.  
6 Some to the common pulpits, and cry out.  
8 People and senators, be not affrighted.  
7 Go to the pulpit, Brutus.

4 And Cassius too.  
5 Here, quite confounded with this mutiny.  
6 Where is Antony?  
8 How many times shall Caesar bleed in sport, That now on Pompey basis lies along No worthier than the dust.  
6 So oft as that shall be, So often shall the knot of us be called The men that gave their country liberty.  
7 What, shall we forth?  
8 I know that we shall have him well to friend.  
8 Be patient till the last. Romans, countrymen, and lovers, hear me for my cause, and be silent, that you may hear. believe me for mine honour, and have respect to mine honour, that you may believe.  
4 None, Brutus, none.  
9 Friends, Romans, countrymen, lend me your ears. I come to bury Caesar, not to praise him. The evil that men do lives after them, the good is oft interred with their bones. So let it be with Caesar. The noble Brutus hath told you Caesar was ambitious. If it were so, it was a grievous fault, and grievously hath Caesar answered it. Here, under leave of Brutus and the rest, for Brutus is an honourable man. So are they all. Come I to speak in Caesar funeral. He was my friend, faithful and just to me. But Brutus says he was ambitious. And Brutus is an honourable man. He hath brought many captives home to Rome whose ransoms did the general coffers fill. Did this in Caesar seem ambitious? When that the poor have cried, Caesar hath wept. Ambition should be made of sterner stuff. Yet Brutus says he was ambitious. And Brutus is an honourable man. You all did see that on the Lupercal I thrice presented him a kingly crown, which he did thrice refuse, was this ambition? Yet Brutus says he was ambitious. And, sure, he is an honourable man. I speak not to disprove what Brutus spoke, But here I am to speak what I do know. You all did love him once, not without cause. What cause withholds you then, to mourn for him? O judgment! thou art fled to brutish beasts, and men have lost their reason. Bear with me. My heart is in the coffin there with Caesar, and I must pause till it come back to me.

## Sample Output 7

the 9 1  
and 9  
caesar 9  
to 9  
i 9  
is 9  
that 8  
be 6  
brutus 9  
he 9