user studies,
multimodal,
speech, usability

In autumn of 2000 the VoiceWeb team invited 12 subjects to test a multimodal demo the team used as presentation material. The multimodal system was an online Music Shop in which users could choose albums of recordings artists, listen to a clip of the album and buy the albums.

Users could use the keyboard and mouse for their data input or they could use their voice. The multimodal system gave feedback via a computer screen and by speech.

The 12 subjects were asked to try 3 systems; voice only, display only and multimodal. After trying all 3 systems the users were asked for their opinion about the systems.

Title **VoiceWeb: Multimodal Demo Test**

Annelies de Bruine
Internet & Mobile Systems Lab
Bristol

Abstract
In autumn of 2000 the VoiceWeb team invited 12 subjects to test a multimodal demo the team used as presentation material. The multimodal system was an online Music Shop in which users could choose albums of recordings artists, listen to a clip of the album and buy the albums.

Users could use the keyboard and mouse for their data input or they could use their voice. The multimodal system gave feedback via a computer screen and by speech.

The 12 subjects were asked to try 3 systems; voice only, display only and multimodal. After trying all 3 systems the users were asked for their opinion about the systems.

---

1. Background

This experiment was a follow-up of the VoiceWeb's Wizard of Oz study earlier in 2000. In July/August we asked people to call a free 0800-number and ask our so-called Music Master 10 questions about music. The system would try to answer the caller's questions. What the callers didn't know was that we had an operator listening in on the conversations and answering the questions by typing short-codes. Our Galaxy system would speak out loud what the operator typed in which made the callers think that the system did understand their questions. We did this experiment to collect data to for improving our speech system. Everybody who called our HP Music Master * received a letter with a cinema ticket. In the letter people were asked whether they want to get involved in further research into spoken language technologies.

This experiment was set up to test the new system after it had been trained with the collected utterances during our Wizard of Oz study. At the same time we improved our Galaxy system some people in the VoiceWeb team worked on a multimodal system with speech input/output and visual input/output. Upgrading the Galaxy system wasn't finished in time for the second study, so we decided to test the demo used by the VoiceWeb team to demonstrate our multimodal system.

2. Methods
Subjects

For the multimodal-demo user experiment I invited 12 people to the Psychology lab in the top floor of HPLabs in Bristol. Two subjects worked at HPLabs, both students who started working for HP only a week before the experiment took place. All other subjects were people who replied to the letter we sent out with the cinema tickets after the Wizard of Oz experiment with the HP Music Line *. Since the subjects replied to our invitation to take part in further research into spoken language technologies the sample of subjects is not representative for the population so we can't generalise and draw conclusions for the whole population.

Most subjects were men, 9 men and 3 women sent back the letter in which they volunteered to take part in further research. All subjects were computer literate except one older lady who only recently started working on computers via courses in community centres. It worked out that a most subjects were computer and gadget enthusiasts, which again doesn't make our sample representative for the population. One person worked at the university on mobile computing and he had a lot of knowledge about speech technology. Other subjects were mainly curious about using speech with computers. (Questionnaires)

Most subjects tried speech technology before coming to HPLabs for the experiment but no one was very positive about their former experiences with speech technology. They all mentioned … (video & questionnaire). When the technology improves they all said they would use it again.

Set-up

Since we initially planned to test the Galaxy system * but we didn't have enough time to set up an experiment to do this. The Galaxy system wasn't working good enough to test it on subjects from outside HPLabs yet, so we decided to focus on getting information about the people who rang the HP Music Line in July/August 2000. We collected data about the subject's computer use to find out how computer literate they were and whether they used speech recognition, palm devices, etc. After the first questionnaire (appendix A) the subjects were interviewed to get more information on their computer use. All but one subject had a computer at home and worked with computers in their jobs.

The next questionnaire asked questions about music (appendix B). Since we are building a system with music domain we decided to collect information about how and where the subjects listen to music and where they get their information about music. The subjects filled in another questionnaire (appendix B) followed by a short interview. Two of the subjects worked in the music industry (club promoter/musician & music copyrights consultant/musician). All other people stated that they were interested in and quite passionate about music.

After the two questionnaires the subjects Multimodal experiment with a short feedback questionnaire after using each system (appendix C). Some subjects started with the voice-only system while the others started with the display-only system. I would read a scenario and asked the subjects to use our systems.

"Say you are walking in town on Park Street. You are planning to buy some music. Then you see an electronic kiosk. You are curious and want to try it. You walk up to the kiosk to get some information about albums you are interested in buying.

The kiosk gives you the chance to work with speech or with a display.

We will show you a few examples.

This is only a prototype, which means that it doesn't have a lot of information yet. You can only ask about Madonna, Elvis Presley and Catatonia. You can listen to samples of the albums (all samples are the same in the prototype) and you can buy the album if you want to.

We will start with voice/display and then we will test the other setting. After each test we will ask you to fill in a short questionnaire. At the end we will discuss the different settings.

Thank you very much"

All sessions except the first one were taped on video. The sessions took approximately one hour per subject. The subject received 2 cinema tickets for their co-operation.

3. Results

The results are twofold. In this report I will focus on the results of the multimodal-demo test. For results on the questionnaire, see Appendix D.

Five (5) subjects stated in the questionnaire that they had used a speech program in the past. These subjects were not very positive and they all said that a lot needs to be improved before they would use speech again to interact with a computer system. Some found it frustrating and quite primitive. Others mentioned that some speech programs need a lot of training for understanding the user, which takes a lot of time. The mediated score for satisfaction of use of speech programs was 40% but all of the users would use it again (68%) and probably quite often as well (58%).

When asked what people would like to do with speech programs, some of the subjects stated that they would like to dictate and have the program do the typing. One subject tried this kind of software already and said that at the moment it takes him a lot of review the document scanning for mistakes. Another subject mentioned that it would be good if you could say what you want instead of having to wait until the system gave you a menu because it is frustrating having to listen to a whole list of choices.

We tried to half of the subjects to start with the voice-only system and the other half with the display-only. Two subjects didn't show up so this didn't work out exactly as planned.

Four people said they preferred working with the display-only system. They mentioned that the main reason to choose the display-only version was that they were used to using a mouse and they were not used talking to a computer. Seven subjects preferred the multimodal system. One subject didn't know which one he preferred. He didn't think the combination of display and speech in our demo worked properly because he had to wait for the speech to be finished before being able to go back. The text-to-speech made the system slow. With the display the subjects could see immediately what was going on, but they had wait to wait for the speech feedback. This subject advised us only to use beeps & pings for feedback. He preferred speech input with display output and no text-to-speech. More subjects made this remark.

Even though 7 out of 12 subjects said they preferred the multimodal system, the display-only system scored better in the questionnaire. The display-only got an overall mediated score of 83%, the multimodal system got 81% and the voice-only system got a score of 73%. The display-only system scored higher on how easy the subjects thought the system was to understand and it scored a lot higher on 'did you know what you could say?' The subjects said that was because they are used to work with mouse, keyboard and visual feedback. The voice-only system scored lowest on all four questions. The subjects thought it was primitive but one subject complimented the VoiceWeb team on the clear cues the system gave. The multimodal came out best on how easy the subjects found it to get the information they wanted and on the expectations of how the systems worked.

Using the Multimodal Demo
Three subjects used their voices for input in the system during the whole experiment. These subjects were the most computer literate of the group and they were also the most gadget/technology minded. The other subjects used voice where they had to type and used the mouse when they could click on an icon.

The first screen asked the subject to choose an artist; Madonna, Catatonia or Elvis Presley. In the first experiments the subjects could either type in the name of the artist or say the name. Everybody started with saying the name of the artist they were interested in. Even when the system didn't understand what the subject said they tried again with repeating the name of the artist.
The second screen showed albums by the artist chosen by the subject. Almost all subjects clicked on the album they were interested in. Only 4 subjects tried to select an album by voice.

On the third screen people could choose whether to buy the album, to listen to an audio clip or to continue shopping. All but the three subjects who did everything by voice choose to play a clip by clicking on the 'play' button. Everybody enjoyed the audio clips, even though a few mentioned that they found the clips a little bit too short to get an idea about the music.

Next the subjects were asked again if they wanted to "buy the album", "play a clip" or "continue shopping". When someone decided to continue shopping they came back to the first screen where they had to choose an artist again. Most subjects mentioned they found it quite confusing that they returned to the first screen and that they had to start all over again. The cues weren't clear and quite a lot of the subjects didn't know what to do.

When subjects decided to buy the album they got a screen in front them with the details of the album(s) they bought. They had use the mouse to click on the continue-button, which was confusing for a few subjects because they thought they could say continue to go on to the next screen. This screen asked for personal details. Some subjects tried to say their name and address, but the system couldn't recognise that and the subjects had to use the keyboard. Everybody smiled when they heard their name after they typed it in and the system told them 'thank you'.

After the subjects used the multimodal system there was space for them to give comments about the system. Some found it annoying that they had to wait to continue until the system finished speaking. One subject said that the voice could be quicker, which was confirmed by other subjects mentioning the system was too slow. Most subjects liked seeing the albums on the screen. They liked speech input and display output without the text-to-speech feedback. Especially when the system named all albums which where visual on the display subjects got annoyed that they couldn't move on until the system finished talking. Also someone mentioned that he didn't need to be told all the time what to do, it was clear after hearing it the first time.

Also some subjects found it hard to know what to say and were looking for the rights words for the system to understand them. One subject mentioned that the voice-only system was primitive and frustrating when it didn't understand what was said. The computer voice wasn't like by all subjects either.

One subject mentioned that it was good because with speech it is hands-free so you don't need to stop what you're doing when you're using the system. He said he didn't need the mouse at all, but it was nice to have it as back up. When the system didn't understand a subject, he or she could get quite annoyed but use the mouse to click to continue. A few subjects said they were used using a mouse and that talking to a computer was new to them.

When a subject mentioned the start screen wasn't clear enough because he didn't know what to say or what to do, we changed the it from typing in the name of one of the artist to a pulldown menu with the names. After that hardly anyone used his or her voice anymore to select an artist, all but one used the pulldown menu.

Sleeves of music albums are visual things and it was clear that all subjects liked the visual feedback. The titles of the albums weren't very clear, which could have been solved by adding extra text information on the screen.

4. Summary and Discussion/Conclusion

Two-third of the subjects said thy preferred the multimodal system to the other systems. However, the scores on the questionnaires indicated that the subjects preferred display only (83%), closely followed by the multimodal system (81%) to voice-only (73%). All 12 subjects liked the combination of being able to say to the computer what they wanted and get visual feedback.

Getting both visual and speech feedback made the system slow and most subjects didn't like they had to wait for the system to stop talking before they could move on.

Most subjects clicked where they could, but spoke to the system when they had to type. After changing the screen from typing to clicking on icons, more people started with using the mouse instead of selecting the artist they wanted information on by voice.

The subjects were more used to use mouse and not to talk to computers, and they said that was a reason to prefer the display-only system to the multimodal system. Some found it hard to find the right words for the system to understand them. Some of the subjects used mouse after the system didn't understand their voice command and subjects mentioned it was good to have the mouse as back up. Only a few subjects stuck to voice input and didn't use the mouse and keyboard at all.

Conclusions

To make a multimodal system it has to be clear for the users what they can say and what other options they have to interact with the system. It is good to give users the opportunity to speak to a system in their words and if the system doesn't understand what has been said a clear message should get back to user.

Maybe it is a good idea to give users a choice whether they want feedback on the screen, via speech or a combination. The experiment showed that users can get annoyed when output of the system is via display as well as speech, so they should at least have the opportunity to turn one of them off. If possible users can get feedback via both speech and display the first time they use the system and afterwards they get it via display only.

Where users have to type they choose speech and where they can click they will use the mouse. This might be the case because people are not used to clever speech programs yet. If you want to give people all choices you can let them click, type or speak, but all subjects in the experiment said they liked the speech input and the display output. So speech recognition should be improved and the team should put time into the design of the display to make what's on screen as clear and attractive as possible.

With speech input and display output the users can interact with a system in fast way. They can use natural language to ask their question and they can have a quick overview of the answer, Especially with 'lists' like train schedules, albums of artist it is better to have it all clearly on a screen than a voice which says the whole list and the user has to choose from that list.

So a multimodal system seems like a very good idea, but a lot of thought has to be put in where and when speech is best and where and when visual information on the display is best. Both have to be presented in a clear and attractive way, especially in these early stages now people are not used to speech technology yet.

Further research

This experiment was only a test of demo material. It would be good to do a proper user study when the system is developed a bit further. It would be a good idea to read literature on the use of displays and the use of speech and when users prefer what. Having more options doesn't necessarily mean a system is better, it might get more confusing.

Recommendations

- Give people the choice to turn off speech feedback if they want to
- Give clear guidance about what the user can say to the system
- Work with icons/buttons to click on where possible instead of typing in queries
- Improve speech recognition

Annelies de Bruine
February 2001

Please fill in the questions below. Just tick the lines wherever you feel it's appropriate.
An example: Are you thirsty at the moment?

|_____/__|
Not at all   Very much

This means I am very thirsty.

I) Do you have a computer?   **PAGE 1 - COMP**
Yes/No

101   Do you use your computer at home?

|_____|
Never   All the time

102   Do you use the computer at home for work?

|_____|
Never   All the time

103   Do you use the computer at home for personal (not work related) use?

|_____|
Never   All the time

104   Do you use a computer at work?

|_____|
Never   All the time

105   When using the computer, do you use the mouse or key combinations (like [Ctrl C])?
|_____|
Mouse   **Key combinations**

II) Do you have an Internet connection at home?
Yes/No

Do you have access to the Internet at work?
Yes/No

201   Do you surf the World Wide Web for pleasure or for work?

|_____|
Pleasure   **Work**

202   Do you buy things via the web?

|_____|
Never   Always

203   Do you use e-mail?

|_____|
Never   Always

204   Do you use e-mail mainly for personal communication or for work?

|_____|
Personal   **Work**

205   Do you use ICQ, AOL Instant Messenger, and/or MSN Messenger?

|_____|
Never   Always

206   Do you chat on the Internet (like IRC)?

|_____|
Never   Always

207   Do you receive e-mails from bands mailing lists or from record labels?

|_____|
Never   Always

208   Do you go to web sites of bands/musicians/record labels on the World Wide Web?

|_____|
Never   Always

III) Have you ever used a speech program?
Yes (Go to 301)/No (Go to 302)

301   Did you enjoy using the speech program?

```
|_____|
```
Not at all   Always

302   Would you use a speech program if it were available to you?

```
|_____|
```
Not at all   Always

303   How often would you use the speech program?

```
|_____|
```
Never   Always

IV) Do you have a mobile phone?
Yes (Go to 401)/No (Go to 402)

401   Do you use your mobile phone often?

```
|_____|
```
Never   Always

402   Would you use a mobile phone if it were available to you?

```
|_____|
```
Not at all   Always

403   Are you/would you be embarrassed using your mobile phone in public?

```
|_____|
```
Never   Always

404   Do you send SMS/text messages on your phone?

```
|_____|
```
Never   Always

405   Do you use your mobile phone for business?

```
|_____|
```
Never   Always

406   Do you use your mobile phone for personal/informal communication?

|_____|
Never   Always

407   Would you/Do you use other features on your mobile than calling & sending SMS/text messages?

|_____|
Not at all   Always

V) Do you have a palm device (palm pilot, Jornada)?
Yes (go to 501) /No (Go to 502)

501   Do you use your palm device a lot?

|_____|
Never   Always

502   Would you use a palm device if it were available to you?

|_____|
Not at all   Always

503   Are you/would you be embarrassed using your palm device in public?

|_____|
Not at all   Very much

VI) Do you own a walkman (cassette) or discman (CDs) or portable minidisk player or MP3 player?
Yes (Go to 601)/No (Go to 602)

601   Do you use it a lot?

|_____|
Never   Always

602   Would you use a portable personal stereo if it were available to you?

|_____|
Not at all   Always

603   Would you use a mobile phone for listening to music if it was possible?

|_____|
Not at all   Always

604   Would you use a palm pilot for listening to music if it was possible?

|_____|
Not at all   Always

605   Do you like gadgets?

|_____|
Never   Always

Music Questionnaire

701   Are you interested in music?

|_____|
Not at all   Always

VIII) Music Magazines

801   Do you read music magazines?

|_____|
Never   Always

802   Do you read reviews in music magazines?

|_____|
Never   Always

803   Do you read articles about artists?

|_____|
Never   Always

804   Do you check the charts in magazines?

|_____|
Never   Always

805   Do you read about music on the Internet?

|_____|
Never   Always

806   Do you read about music in newspapers or other (not music) magazines?

|_____|
Never   Always

IX) Buying music

901   Do you often buy music?

|_____|
Never   Always

902   Do you listen to an album before you buy it?

|_____|
Never   Always

903   Do you read reviews before you buy an album?

|_____|
Never   Always

904   Do you use the Internet for buying music?

|_____|
Never   Always

905   Do you share music with your friends (making compilation tapes/CDs for each other)?

|_____|
Never   Always

906   Do you buy music after friends recommend it?

|_____|
Never   Always

X) Listening to music

1001   Do you listen to music while doing something else?

|_____|
Not at all   Always

1002   Do you listen to the radio?

|_____|
Never   Always

1003   Do you listen to music on a computer?

|_____|
Never   Always

1004   Do you listen to music while you are at home?

|_____|
Not at all   Always

1005   Do you listen to music while you are outdoors?

|_____|
Not at all   Always

1006   Do you listen to music when you are using public transport?

|_____|
Never   Always

1007   Do you listen to music while you are in a car?

|_____|
Never   Always

1008   How often do you use portable music devices?

|_____|
Never   Always

1009   Do you listen to music at work?

|_____|
Never   Always

XI) Interests
1101   Are you interested in the charts?

|_____|
Not at all   Very much

1102   Are you interested in top 10s of famous DJs?

|_____|
Not at all   Very much

1103   Are you interested in trivia/gossip about artists?

|_____|
Not at all   Very much

1104   Do you watch video clips?

|_____|
Never   Always

1105   Are you interested in the personal life of pop singers?

|_____|
Not at all   Very much

1106   Do you listen to a particular genre of music?

|_____|
Not at all   Always

1107   Do you use the Internet for reviews/recommendations?

|_____|
Never   Always

1108   Do you use your mobile phone to get information about music?

|_____|
Never   Always

1109   Do you use teletext/Ceefax for information about music?

|_____|
Never   Always

Appendix C

Was the system easy to understand?

|_____|
Not easy at all   Very easy

Was it easy to get the information you wanted?

|_____|
Not easy at all   Very easy

Did you know what you could do?

|_____|
Not at all   Yes

Did the system work as you expected?

|_____|
Not at all   Yes

Remarks:

Appendix D

Subject	V/D first	No	V=0 M=1	Q101	Q102	Q103	Q104	Q105
01	v	1	1	*	*	*	*	*
02	v	2	0	90	46	96	93	48
03	v	3	1	95	39	77	90	44
04	v	4	1	87	90	91	96**	
05	v	5	0	93	74	91	98	27
06	d	6	1	88	55	53	87	70
07	**	7	1	77	96	34	96	51
08	d	8	1	98	72	80	42	52
09	v	9	1	96	98	49	98	47
10	**	10	0	19	5*	*		14
11	d	11	1	98	98	65	97	97
12	d	12	1	97	7	95	24	45

Q201	Q202	Q203	Q204	Q205	Q206	Q207	Q208	Q209
*	*	*	*	*	*	*	*	*
52	60	55	91	41	33	32	53	58
64	67	7	93	58	90	92	37	81
24	79	28	95**		0	1	92	96
82	84	28	95	32	0	1	32	72
**	**	**	**	**	**	**	**	28
72	**	28	97	91	1	4	2	2
28	**	30	80	18	29	23	0	20
65	**	14	96	75	3	4	79	75
*	**	4	4	3	3	6	8	9
45	**	23	97	47	46	46	96	46
21	**	36	98	4	2	4	54	56

Q301	Q302	Q303	Q401	Q402	Q403	Q404	Q405	Q406
*	*	*	*	*	*	*	*	*
55*		20	78*		9	64	0	100
15	84	82	92*		9	87	79	81
75	82	76	1	20	53	4	3	2
*	81	76	61*		71	47	92	75
54	76	59	28*		17	0	29	64
*	49	28*		17	25	5	0	0
46	30	8	29*		83	79	13	90
*	72	47	80	82	8	94	90	90
5	92	90	93	93	2	4	94	92
*	46	83	96	96	0	96	0	97
*	71	72	46*		4	8	25	82

Q407	Q501	Q502	Q503	Q601	Q602	Q603	Q604	Q605
*	*	*	*	*	*	*	*	*
0*		98	0	67*		4	10	80

74*		93	5	84	85	84	84	86
0*		48	51	96	97	0	55	49
75*		76	15	77*		56	55	93
76	79*		0	41*		27	28	98
1*		8	9	21	22	5	5	24
7*		87	6	21	15	4	5	81
49	94	94	3	95	95	95	95	95
10	5	6	6	95	95	97	93	94
97*		96	0	46	45	80	79	96
3*		71	3	47	47	27	52	78

Q701	Q801	Q802	Q803	Q804	Q805	Q806	Q901	Q902
*	*	*	*	*	*	*	*	
73	28	90	49	15	92	45	24	6
95	83	73	85	57	67	23	51	88
95	96	91	91	73	86	85	72	47
97	66	69	73	73	67	78	93	62
87	15	26	34	1	68	63	75	5
67	4	4	4	5	2	39	3	38
83	12	13	38	2	33	43	79	40
94	72	47	70	92	49	49	95	50
92	4	5	85	6	9	90	92	94
97	49	49	48	96	97	49	79	47
80	70	89	77	69	57	75	54	66

Q903	Q904	Q905	Q906	Q1001	Q1002	Q1003	Q1004	Q1005
*	*	*	*	*	*	*	*	
15	0	100	85	60	4	100	74	23
53	9	73	59	65	50	87	82	51
61	20	13	52	91	90	87	89	51
52	21	50	53	80	61	68	94	71
58	88	8	37	68	15	11	65	6
36	1	2	3	16	56	39	62	19
8	3	12	31	90	92	76	95	19
50	5	50	51	77	88	75	76	51
93	3	9	91	95	92	6	94	96
47	0	46	74	97	96	71	97	25
95	32	78	77	66	65	44	65	52

Q1006	Q1007	Q1008	Q1009	Q1010	Q1101	Q1102	Q1103	Q1104
*	*	*	*	*	*	*	*	
64	100	73	0	0	7	6	0	100
85	86	70	89	91	50	77	64	78
77	86	83	67	52	53	51	52	75
47	95	70	93	66	66	51	64	65
71	82	67	6**		2	3	14	14
18	41	44	14**		3	2	2	16
17	91	13	12*		13	0	44	49

76	76	75	78	79	95	77	94	95
96	95	96	3**		95	94	93	95
14	97	49	0**		84	96	69	87
68	65	48	21**		28	31	62	61

Q1105	Q1106	Q1107	Q1108	Q1109	Q1110	v1	v2	v3
*	*	*	*	*	*	87	64	7
0	15	95	0	0	57	74	73	90
48	24	79	11	10	96	78	78	68
51	51	50	5	63	93	53	49	52
61	51	55	53	81	97	64	44	87
7	78	62	0	0**		91	90	67
5	40	3	1	2**	**	**	**	
11	10	39	1	4**		38	57	28
49	6	51	6	52	97	95	95	95
94	94	8	9	11**	**	**	**	
16	95	71	33	0**		74	75	96
64	37	64	2	53**		98	55	96

v4	d1	d2	d3	d4	m1	m2	m3	m4
89	89	87	88	90	99	90	100	99
100	100	63	100	32	83	83	100	87
86	94	93	93	93	96	96	85	89
45	75	63	32	28	55	52	46	48
67	663	44	70	38	75	80	68	71
89	92	88	88	71	92	87	85	83
**	**	**	**	**	80	52	17	36
56	83	75	82	82	94	91	70	49
50	95	96	95	95	94	95	97	97
**	**	**	**	**	**	**	**	**
96	96	97	97	96	84	88	67	97
52	97	98	98	97	97	98	97	74

v1	v2	v3	v4	d1	d2
87	64	7	89	89	87
74	73	90	100	100	63
78	78	68	86	94	93
53	49	52	45	75	63
64	44	87	67	663	44
91	90	67	89	92	88
**	**	**	**	**	**
38	57	28	56	83	75
95	95	95	50	95	96
96	96	95	94	97	95
74	75	96	96	96	97
98	55	96	52	97	98

d3	d4	m1	m2	m3	m4
	88	90	99	90	100	99
	100	32	83	83	100	87
	93	93	96	96	85	89
	32	28	55	52	46	48
	70	38	75	80	68	71
	88	71	92	87	85	83
**	**		80	52	17	36
	82	82	94	91	70	49
	95	95	94	95	97	97
	96	96	96	96	96	96
	97	96	84	88	67	97
	98	97	97	98	97	74