# CIRVR Job Interview Conversation Coding Guidelines

The CIRVR interview script includes a fixed set of question types that can each be categorized generally in the following dialog acts/speech acts/labels. The description of each of these is provided in the table below. Each of these question types is intended to elicit specific types of responses or expects certain types of responses or answer types that are specified in the table "Answer Dialog Acts".

Example from scripts (logs):

**What is your name?**
> **Tag:** wh
> **Sub-tag:** hum
> **Expected Answer:**
> My name is Robert (hum-a), or could just say **Robert.**

**Have you had any other jobs before this interview?**
> **Tag:** bin (binary, yes or no question)
> **Expected answer:**
> y, n, y-d, n-d or any answer from the answer table.
>
> **I** worked as a dishwasher at Olive Garden (sno)
> **I have** worked as a dishwasher (y)
> **Yes, I worked at** …. (y-d).

**What did you learn from this experience?**
> **Tag:** wh
> **Sub-tag:** des (description)
> **Expected answer:**
> sno, so, dno, ack. Could be multiple statements or "I'm not sure", "I don't know", etc.

**Did you participate in extracurricular activities in school and if so which activities?**
> **Tag:** wh
> **Sub-tag:** ent (entities)
> **Expected answer:**
> Art and science (ent-a)
> Math club (ent-a)
> Marching Band (ent-a)

The explanations and guidelines for coding utterances have been derived partially from the SWDA coder's manual (https://web.stanford.edu/~jurafsky/ws97/manual.august1.html), and some based on intuitive learning by analyzing the conversation files from the CIRVR Pilot Study #2, just to make sure we are covering all aspects of the expected dialogues/utterances for the future. To learn more about dialogue acts, speech acts, the concepts behind them, see references [1-3]. The last reference is the paper from which the following scheme has been derived. There are a few additions made to the scheme the author's have proposed to consider the needs for the CIRVR scheme. (Since our script is the same for every single interview, with a few variations, the tags for those can be the same throughout).

# QUESTIONS

## Questions Dialog Acts

| Category | Description | Example |
|---|---|---|
| wh | This is a wh-* kind of question. <br> These generally start with words like **who, what, where, when, why, how, etc.** | What is your name? |
| wh-d | Wh-* kind of question. <br> There is more than one statement in a what question, it a **wh-declarative question.** <br> These questions have some information prior to the actual question | You said Math is your favorite subject. What kind of grades did you get in Math? |
| bin | Binary question. Can be answered with a simple "yes" or "no" | Have you had any other jobs before this interview? |
| bin-d | Binary-declarative question which can also be answered with "yes" or a "no". <br> In this case, the person who asks the question, knows the answer but asks for verification. | That is where you work, right? |
| qo | Open Question. <br> General questions. <br> Not specific to any context. <br> These questions are **asked to know the opinions** of the person who is answering | How do you feel this interview is going? |
| or | This is a choice question. <br> Made up of two parts, connected by conjunction "or". This can elicit a "yes" or "no", with explanations as to why, or any kind of "entity" like Microsoft word. | Do you have any experience with spreadsheet software such as Microsoft word or Apple pages? |

The wh question category is further broken down into the types of answers that the wh and wh-d questions elicit.

## Wh-Question Dialog acts

| Category | Description | Example |
|---|---|---|
| num | Wh-* question specific to numeric quantities | How many years of experience do you have with excel? |
| hum | Wh-question specific to human beings | What is your name? |
| loc | What question specific to locations | What is the name of the city where you live? |
| ent | Wh-question specific to other entities | What subject did you most enjoy in school? |
| des | Wh-question that generally are descriptive questions | How do you feel this interview is going? |

All of the question dialogue act tags are part of the 5.2.2 Info-request category in the Coder's manual. The coder's heuristics have been defined below:

## 1. wh and w-d

Wh-* "interrogative questions" must have subject-inversion. Subject-inversion or subject-verb inversion is when the subject and the verb switch order so that the subject appears after the verb. For example,

**Jim sat** under the tree. → Under the tree **Jim sat.**

These generally start with words like **who, what, where, when, why, how, etc.**

wh      how many hours per week on average would you normally spend entering data into spreadsheets?
wh      what is your name?

wh        why is math your favorite subject?
wh        who is your favorite team?
wh        what are your long-term goals?
wh        how old are your children?
wh        where do you live?

The wh-d stands for declarative questions. These could often include "echo questions" ("you said what?"). There is more than one statement in a what question, it a **wh-declarative question.** These questions have some information prior to the actual question

wh-d    and you say you've had him for how long?
wh-d    when you say the morning news, or evening news or national news is when?
wh-d    you said math is your favorite subject. what do you specifically like about math?

Often these wh-* questions elicit specific type of responses that can be captured by the labels in the table "Wh-Question Dialog Acts". These can include Person Name, Locations such as cities, countries, regions, Numbers that can include currencies, years, hours, minutes, etc. Other entities specific to the question can also be captured by these questions such as "What is your favorite subject?" is a question that expects an entity such as Math, Science, Art, Physics. There are some wh-* questions that elicit descriptive responses, such as "How do you think you are performing in this interview?". These will expect statements such as "good", or "I think I'm doing well". The following give an example of wh-* subtypes:

wh (**num**)    how many hours per week would you normally spend entering data into spreadsheets?
*This question expects a number as an answer.*

wh (**hum**)    what is your name?
*This question expects any kind of human information such as person name.*

wh (**loc**) where are you originally from?
*This type of question expects a location as a response.*

wh (**ent**)    what are your hobbies?
*This type of question expects some entities or keywords such as Soccer, Painting, Cooking, Baking, etc.*

wh (**des**)    tell me, why is math your favorite subject?
*This type of question elicits description answers and expects responses that could be statements (sno, so) or "dno" answers like "I don't know", "not sure".*

## 2.   bin and bin-d

Binary question. Can be answered with a simple "yes" or "no". They should have subject inversion, and also question intonation (has the tone of a question).

bin       Do you have any certifications?

|     | Do you have any pets? |
| --- | --- |
| bin | Do you have any previous work experience? |
| bin | Do you? |
| bin | Have you worked in a diverse group before? |

Yes-No binary questions that are pragmatically questions, but have a declarative syntax are marked with bin-d. Binary-declarative question which can also be answered with "yes" or a "no". In this case, the person who asks the question, knows the answer but asks for verification.

bin-d    That is where you work, right?

### 3.  qo

There are open ended questions or general questions like "how about you" or "what do you think". Not specific to any context. These questions are **asked to know the opinions** of the person who is answering. This category qo is meant to address any kind of questions which we think place a few (if any) constraints on the form of the answer.

| qo | How about you? |
| --- | --- |
| qo | How do you feel you are currently performing in this interview? |
| qo | how about yours? |
| qo | what do you think? |
| qo | how about your community? |
| qo | what do you think about the benefits in jobs? |
| qo | what are your opinions on it? |

### 4.  or

This is a choice question. Made up of two parts, connected by conjunction "or".

| or | Do you have any experience with spreadsheet software such as Microsoft word or Apple pages? |
| --- | --- |
| or | Do you live in a house or a place where you lease or rent? |

Since this is an interview scenario where the interviewee might be required to respond with an entity such as a tool like "Microsoft word"

or    Do you have experience with Java or C# or any other programming language?

The user might say "yes" or "no" or/and give an explanation. They might even respond with just an entity such as "Java", "C sharp", "C#", "Excel", etc. However, it gives the responder a choice.

Often times, in real life, the listener could interrupt mid question before the or-clause is complete and answers the or-question as if it were a yes-no question. For example:

or    Did you bring a pen or….
Responder: no, I didn't.

This type of scenario will not be found in CIRVR's current version because the user has to press a key on the keyboard to respond, and the entire interviewer question is logged, but it is good to consider for the future when we allow mid-sentence interruptions. If the or clause is incomplete, this type of question will come under the "or" choice question category.

## ANSWERS

**Answers Dialog acts**

| Category | Description | Example |
|---|---|---|
| y | Any kind of yes answer | "yes", "yeah", "of course", "definitely is", "that's right", "I am sure", etc. |
| y-d | It is a category when a person answering the binary question not only says yes, but also given an explanation for this answer. | Yes. I have experience with excel. |
| n | No answer or variations of "no" | No, I don't think so, "certainly not", "I am afraid not", "not really", "I don't have experience…", "we don't", etc. |
| n-d | No answer, with an explanation. | No, I don't have experience with excel.I have not had the opportunity to use it. |
| xx | These include any line that is uninterpretable. These can include utterances that stop after one word like "I" and then nothing. When the user does not submit an answer. | "User didn't respond" or anything that looks incomplete with 1 word for example, "i…", and the user stopped |
| sno | Statement non-opinion | I started working on a project the other day. It's really nice. |
| so | Statement opinion | I think, I believe, I feel, etc. |
| ack | Acknowledgements | "okay", "uh-huh", "I see", "um" etc. |
| dno | It is a response given when the person is unsure, doesn't know, or doesn't recall. | I don't know. Maybe. I guess. I suppose. |
| query | Asking a question with a question or an interviewee-initiated question. The answer has no information, it is a confrontation or a question about the job. | So you say that is a problem? What is my salary? How many hours per week of work? …etc. |

**Sub-label Answer tags (Optional. Only include when the criteria is met in any of the above answers).**

| num-a | Numeric answer wh-q that expects a number | 1-10, $200, million, two, 3, 10 years… |
|---|---|---|
| hum-a | Human related answer to wh-q that asks about the person. | My name is Robert, my father's name is Robert Sr, (any name) |
| loc-a | Answer with a location in it, or regions. | Cities and regions |
| ent-a | Entities of any kind like when the user is ask about hobbies, subjects studied in school, etc. | Math, soccer, art and science, cooking, baking, Microsoft word. |

**1. y, y-d**

**y**

Unlike the Coder's Manual, the scheme here includes a combination of ny yes answers and, na for affirmative answers. These include is only "yes", "yeah", "yep", "uh-huh", and such other variations on "yes", such as "I have experience as a …", or 'I guess'.

Examples of all "y" tags include any kind of yes answer:

| y | yeah |
|---|---|
| y | yes |
| y | uh, yeah |
| y | well, yeah |
| y | well, yes |
| y | yes, actually |
| y | yep |
| y | yup |
| y | yes, uh |
| y | yes, definitely |
| y | **It is        (Affirmative)** |
| y | I am sure |
| y | of course |
| y | yeah, I do |

**y-d**

y-d is a category when a person answering the binary question not only says yes, but also gives an explanation for this answer or expands upon the yes.

Example:

| y-d | Yes. I have experience with excel. |
|---|---|
| y-d | Yeah, I agree with you on that because I feel the same way. |
| y-d | yes. I worked as a dishwasher at cracker barrel |

Note: The y-d tag only includes those utterances that have a "yes", "yeah", "yup/yep" and then an explanation.

**2. n, n-d**

The no and variations of know include a combination of nn (no) and ng (negative answers) (see coder's manual). This include nos, "I don't", "we didn't", "we were not taught that", "we don't have experience".

**n**

No answer or variations of "no".

| n | no |
|---|---|
| n | uh no |
| n | well no |

| | |
|---|---|
| n | oh no |
| n | um no |
| n | nope |
| n | probably not |
| n | actually no |
| n | I don't |
| n | we don't |
| n | definitely not |
| n | Not really |
| n | not as much |
| n | not so much |
| n | nah |

Often times the interviewee may get stuck thinking "well….". This will be considered negative and will come under this category.

**n-d**

No answer, with an explanation.

| | |
|---|---|
| n-d | No, I don't have experience with excel. |
| n-d | no. I did not participant in any extra curricular activities |

**Note:** The **n-d** category only includes explanations or expansions after the interviewee has said "no", "nah", "nope". This does not include utterances like the following.

| | |
|---|---|
| n | I have not had the opportunity to use Excel. |

| | |
|---|---|
| bin | do you code? |
| n | not so much. |

The above have the "**n**" tag.


3. **sno and so**

These stand for **statement non-opinion** and **statement opinion.**

**sno**

According to the Coder's manual, **when in doubt, it is probably sno.** Use sno when the interviewee is explaining something or telling a story or making basic statements, that don't have opinions associated with them, and the topic is personal. Look for "I" and "we" referring to the interviewee and his or her acquaintances or family. This is not "we" referring to the interviewer and interviewee. Just "we" (him or her and the co-workers) like "we started a project the other day".

Think of these as "personal statements". These are of three kinds –narrative (pieces of story), declarative statements (boulder is north of Denver), and personal statements (I was born in Chicago. I get along well with people in all groups).

Here are examples from the SWDA coder's manual:

| | |
|---|---|
| wh | Speaker A: how about you? |
| sno | Speaker B: well, we have a cat |
| sno | Speaker B: he is probably, oh, a good two years old, big, old, fat and sassy tabby. |
| sno | Speaker B: he's a very possessive cat. |

Here is an example from a CIRVR log:

| | |
|---|---|
| or | do you have any experience using spreadsheet software such as microsoft excel or apple numbers, and if so  which ones have you used? |
| sno | I still use apple at microsoft  so I use both. |
| wh | that's great and how proficient are you with ? |
| sno | I say i'm very well at it. |
| n | not the best but i'm very well at it. |

**so**

The biggest clues however, for **so,** statement-opinion, are phrases like the following:

> I think
> I believe
> It seems
> It's my opinion that
> I mean
> Suppose
> Of course, … (not the same as **y** tag of course. That is an affirmative answer).
> Impersonal "we"
> Impersonal "they" as in "they say it rains a lot there…"

Example:

| | |
|---|---|
| wh | how do you feel this interview is going? |
| so | A little bit good. OR I think it is going alright. |

Here is an example of using an impersonal "we" in an **so statement-opinion**:

| | |
|---|---|
| so | This is what I find particularly difficult in that, uh, if **we** see injustice, the way … |

Oftentimes, an sno utterance might look like an opinionated so statement, but it isn't always, because it's not something that the interviewee/listener can "get to be an expert on".

Here is an example from the coder's manual where Speaker A is talking about a family camper they bought and the listener is not an expert on camper's:

| sno: | it is really nice |
| --- | --- |
| sno | in fact, it even had a little refrigerator, uh, and the whole business. |
| sno | it was quite nice in that respect. |
| sno | everything was very convenient. |

## 4. ack

These are acknowledgements, agreements, accept/reject. These include, "ok", "okay", "oh, okay", "uh-huh", "I see", "alright", "exactly", "definitely", "hmm", "you're right", "me, too", "um". and any variations that imply an acknowledgment. In CIRVR's Interview, not many answers will have these, however, the virtual interviewer might have acknowledgements, like "alright" or "that's great" or "that's okay" in the dialogue. These are acknowledgements to the interviewee answer.

Azure Speech to Text might return something that looks like "Um?". Mark this as an 'ack'.

## 5. xx

This accounts for the uninterpretable responses. Sometimes the interviewee might run out of time and might not get an answer. The log will have a line saying, "User didn't respond", or something of the sorts. These are coded as 'xx'. Another example of uninterpretable utterances if the utterances has only one word in the form "I", and then nothing. This could indicate that the interviewee either started on a response, and did not complete it, or submitted an incomplete one-word response that did not make sense at all and have no information and does not indicate any of the labels above.  An example of this is in the image below:

| 9 | PastWork | 2020-11-0 | Before getting into some technical questions about the position  tell me  do you have an | intervi |
| --- | --- | --- | --- | --- |
| 10 | PastWork | 2020-11-0 | User Didn't respond | | user |

| | 47 | 2020-11-0 | Can you tell me about a time that you had to make a difficult decision? | interview |
| --- | --- | --- | --- | --- |
| | 47 | 2020-11-0 | Ha. | user |

## 6. dno

It is a response given when the person is unsure, doesn't know, or doesn't recall. For responses that are neither y and y-d, or n and n-d, those come in the dno or other-answers category. The most common one is "I don't know". Other variants include "I'm not sure", "I cannot recall", "I can't say for sure", "don't know", "I guess", "I suppose", "Maybe", etc.

## 7. query

This category addresses the utterances that includes questions from the interviewee. CIRVR has the option for the interviewee to ask questions for the interviewer to answer. These can be found at any time during the interview where the **speaker tag** implies "user" in the Excel log file. Most question from the user you will find towards the end, and they will have the **section tag** "Question" and the **speaker tag** "user" in the same line. Here are examples of interviewee-initiated questions that will be considered a **query**. **Note: "please" is a request and can be considered a query.**

| 79 | | 55 | 2020-11-1 | Alright  Do you have any questions for me about the job or our organization? | | interview | Question |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 80 | | 55 | 2020-11-1 | What exactly? | | user | Question |

| | | |
|---|---|---|
| Alright  Do you have any questions for me about the job or our organization? | interview | Question |
| What is my job entail? | user | Question |

**Note: Some user answers will have some entities related to them, such as their name, where they live, how old they are, these will be statements, but will have sub tags associated with them.**

Just as the wh-* questions have sub categories, the user-responses will also have sub tags associated with them if they have the following types of responses within the utterance. A couple of these have been shown in the coding heuristics from sno (see 1).

sno      My name is Robert (num-a)
sno      I live in the Nashville area (loc-a)
sno      Art and science. And sometimes basketball. (ent-a)

Examples of the 4 types :
sno      my name is robert (hum-a)
sno      i live in new york (loc-a)
sno      i have been coding in python for the last 5 years (num-a)
sno      math (ent-a)

Even if the interviewee responds with a one-word answer. This will be considered an **sno**, but will also have an answer sub tag associated with it. For example,

wh      what is your name?
sno      robert (num-a)

wh      what extra-curricular activities did you participate in?
sno      art and science (ent-a)

**NOTE: If the user responds with just their name, a number, or any entity, the assigned_label will be 'sno'.**
        **Otherwise, in any other case, for example a 'yes answer (y)', if the yes answer includes an entity:**
        **e.g. "Yes, I have experience with Microsoft Excel", then the assigned label will be y-d, and the sub_label will be ent-a.**
        **So, only add a sub_label, when the criteria of the sub label is met.**

## Misc Dialog Acts – from SWDA-DAMSL

| Category | Description | Example |
|---|---|---|
| ft | Thank you's | "thanks", "thank you" |
| fa | Apologies | "I'm sorry" |
| fp | Greetings, conventional openings | "hello", "nice to meet you" |
| fe | Exclamations | "shoot", "oh goodness", "jeez" |

**'ft'**
These include any type of thanking statement. "Thanks", "Thank you very much", and any variation.

**'fa'**
These include apologies of any kind. "My bad", "sorry", "I'm sorry", "my apologies", "I apologize", etc.

**'fp"**
These include greetings like "hello", "hi", "nice to meet you", etc.

**'fe'**
These include exclamations like "shoot", "oh my god", "oh goodness", "gosh", any bad cuss words.

### References

1. https://www.aclweb.org/anthology/J00-3003.pdf
2. https://web.stanford.edu/~jurafsky/ACL98discourse.pdf
3. Chakravarty, S. et al. "Dialog Acts Classification for Question-Answer Corpora." *ASAIL @ICAIL* (2019).

| Category | Description | Example |
|---|---|---|
| **wh** | a wh-* kind of question. | What is your name? |
| **wh-d** | a **wh-declarative question.** | You said Math is your favorite subject. What kind of grades did you get in Math? |
| **bin** | Binary question. | Have you had any other jobs before this interview? |
| **bin-d** | Binary-declarative question | That is where you work, right? |
| **qo** | Open Question. General questions. Not specific to any context. | How do you feel this interview is going? |
| **or** | This is a choice question. | Do you have any experience with spreadsheet software such as Microsoft word or Apple pages? |

| Category | Description | Example |
|---|---|---|
| y | yes answer | "yes", "yeah", "of course", "definitely is", "that's right", "I am sure", etc. |
| y-d | yes, with explanation | Yes. I have experience with excel. |
| n | No answer | No, I don't think so, "certainly not", "I am afraid not", etc. |
| n-d | No, with explanation. | No, I don't have experience with excel. |
| xx | uninterpretable. | "User didn't respond" |
| sno | Statement non-opinion | I started working on a project the other day. |

| so | Statement opinion | I think, I believe, I feel, etc. |
|---|---|---|
| ack | Acknowledgements | "okay", "uh-huh", "I see", "um" etc. |
| dno | Other answers | I don't know. Maybe. I guess. I suppose. |
| query | Interviewee question | So you say that is a problem? What is my salary? How many hours per week of work? …etc. |

| Category | Description |
|---|---|
| ft | Thank you's |
| fa | Apologies |
| fp | Greetings |
| fe | Exclamations |