An Evaluation for Intent Classification and Out-of-Scope Prediction

Supplementary Material

	Ask an AI questions about a topic domain

Suppose you have an intelligent device such as Amazon Alexa, Apple Siri, or Google Assistant.

Given a topic domain, please provide 5 different things you might ask the intelligent device.

Topic Domain: **"assume the intelligent device can answer questions related to tasks around the home"**

	Rephrase an original question or statement

Suppose you have an intelligent device such as Amazon Alexa, Apple Siri, or Google Assistant.

Given an original phrase, provide 5 different ways of saying the same phrase.

Original phrase: **"how's the weather"**

	Phrase a question or statement given a scenario

Suppose you have an intelligent device such as Amazon Alexa, Apple Siri, or Google Assistant.

Given a scenario, provide 5 different ways of asking or commanding the AI.

Scenario: **"suppose you want to go to a restaurant but you want to know how long of a wait there will be there"**

Figure 1: Examples of *scoping* (top), *rephrase* (middle), and *scenario* crowdsourcing tasks for intents from three domains. Tasks used to collect out-of-scope data used the same format as the *scoping* and *scenario* tasks, but the out-of-scope tasks asked crowd workers for 2 phrases instead of 5.

A Crowdsourcing Prompts

Example task descriptions for *scoping*, *scenario*, and *rephrase* tasks are shown in Figure 1. We used *scoping* and *scenario* tasks for collecting out-of-scope data. The out-of-scope tasks asked crowd workers for 2 phrases per task instead of 5 (i.e., 2 phrases per person per task instead of 5). We used the Amazon Mechanical Turk crowdsourcing platform.

B Domains and Intents

The dataset domains are listed in Table 1. The tables displayed in the following pages of this doc-

Domain	Table
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Table 1: Table IDs for each of the 10 in-scope domains, as well as for the out-of-scope data. Each table in the second column lists all 15 intents for each in-scope domain, as well as 3 sample queries from each intent. The out-of-scope table lists 45 random out-of-scope samples.

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Table 13 lists examples from the data used in the wiki aug *oos-binary* approach.

C Classifier Model Details

We used grid search in all cases to find optimal hyperparameters. Optimal hyperparameters can be found in the file called `hyperparameters.csv`, which can be found in the repository at `https://github.com/clinc/oos-eval`.

Domain	Intent	Query
BANKING	TRANSFER	*move 100 dollars from my savings to my checking*
	TRANSFER	*put $20000 into my checking account from my savings account*
	TRANSFER	*send fifty dollars from me to carrie*
BANKING	TRANSACTIONS	*how much did my last purchase cost*
	TRANSACTIONS	*what were my last five transactions on my visa card*
	TRANSACTIONS	*what did i buy last*
BANKING	BALANCE	*what's my current bank account total*
	BALANCE	*how much do i have in my savings account*
	BALANCE	*how much is in my pnc account*
BANKING	FREEZE ACCOUNT	*may you stop a paymet on my account*
	FREEZE ACCOUNT	*please put a hold on my retirement account right now*
	FREEZE ACCOUNT	*how can i stop transactions on my account*
BANKING	PAY BILL	*can you give me a hand paying my water bill*
	PAY BILL	*pay my gas bill with my checking account*
	PAY BILL	*use my park bank account to pay my electric bill*
BANKING	BILL BALANCE	*what's my bill for water and electricity*
	BILL BALANCE	*read my bill balances*
	BILL BALANCE	*how much do i owe for my gas and phone bills*
BANKING	BILL DUE	*tell me the last day i can pay my gas bill*
	BILL DUE	*when do i have to pay my internet*
	BILL DUE	*when does my gas bill need paid by*
BANKING	INTEREST RATE	*what interest rate does my checking account come with*
	INTEREST RATE	*what's my checking account yielding in interest*
	INTEREST RATE	*i need help finding the apr on my aspire loan*
BANKING	ROUTING NUMBER	*what is chase bank's routing number*
	ROUTING NUMBER	*where do i find my routing number for my pnc account*
	ROUTING NUMBER	*where do i find the routing number for great western bank*
BANKING	MINIMUM PAYMENT	*what is my minimum verizon bill payment*
	MINIMUM PAYMENT	*what is the lowest amount i can pay for my cellphone bill*
	MINIMUM PAYMENT	*lowest amount for cable bill*
BANKING	ORDER CHECKS	*how do i order more free checkbooks*
	ORDER CHECKS	*i just used my final check order more*
	ORDER CHECKS	*i need to know how to order checks for my bank of america account*
BANKING	PIN CHANGE	*my checking account needs a new pin number*
	PIN CHANGE	*i need help changing my pin*
	PIN CHANGE	*change my amex account pin to 1234*
BANKING	REPORT FRAUD	*there are some questionable charges on my card*
	REPORT FRAUD	*there's a shady charge from comcast on my account*
	REPORT FRAUD	*i need to report fraudulent activity on my card*
BANKING	ACCOUNT BLOCKED	*why is my bank account locked*
	ACCOUNT BLOCKED	*what could cause a hold on my savings account*
	ACCOUNT BLOCKED	*it looks like my account is blocked but i have no clue why*
BANKING	SPENDING HISTORY	*how much did i spend at restaurants last week*
	SPENDING HISTORY	*how much money have i dropped recently*
	SPENDING HISTORY	*what has gas cost me this week*

Table 2: Sample queries from the **BANKING** domain.

Domain	Intent	Query
CREDIT CARDS	CREDIT SCORE	*is my credit score high*
	CREDIT SCORE	*how bad is my current credit score*
	CREDIT SCORE	*what is my credit score*
CREDIT CARDS	REPORT LOST CARD	*my visa was stolen*
	REPORT LOST CARD	*i can't seem to find my gold card and want it reported as lost*
	REPORT LOST CARD	*i want you to repord my card as lost*
CREDIT CARDS	CREDIT LIMIT	*how high is my credit limit for my old navy card*
	CREDIT LIMIT	*what is my spending limit on my chase sapphire card*
	CREDIT LIMIT	*what is my credit limit looking like*
CREDIT CARDS	REWARDS BALANCE	*i would like to check my rewards for my credit card"*
	REWARDS BALANCE	*how many points do i have on my visa*
	REWARDS BALANCE	*how high are the rewards on my discover card*
CREDIT CARDS	NEW CARD	*can i apply for a discover card*
	NEW CARD	*i want to apply for a alphabank card*
	NEW CARD	*help me get an american express card*
CREDIT CARDS	APPLICATION STATUS	*how is the status of my credit card application coming along*
	APPLICATION STATUS	*how far has my application for the hsbc card proceeded till now*
	APPLICATION STATUS	*when will i know if my visa card application was approved*
CREDIT CARDS	CARD DECLINED	*why was my card not working at target*
	CARD DECLINED	*can you help me understand why my card got declined*
	CARD DECLINED	*i could not buy food using my card when i was in vietnam*
CREDIT CARDS	INTERNATIONAL FEES	*does my visa have international transaction fees*
	INTERNATIONAL FEES	*will i be charged if i use my card in japan*
	INTERNATIONAL FEES	*if i use my card in england will it cost me extra*
CREDIT CARDS	APR	*is the apr on my credit card good*
	APR	*what's my apr on my discovery card*
	APR	*how much do i pay in apr on my amex card*
CREDIT CARDS	REDEEM REWARDS	*i have credit card points but don't know how to use them*
	REDEEM REWARDS	*how can i cash in rewards on my chase card*
	REDEEM REWARDS	*help me figure out redemption of my credit card points*
CREDIT CARDS	CREDIT LIMIT CHANGE	*can i change my credit limit*
	CREDIT LIMIT CHANGE	*you need to tell me how to increase credit limit for my chase card*
	CREDIT LIMIT CHANGE	*how do i get my credit limit increased to $1000*
CREDIT CARDS	DAMAGED CARD	*my card was in my pocket and bent*
	DAMAGED CARD	*i dropped my card in my gasoline and the printing wore off*
	DAMAGED CARD	*my credit card snapped in half while i was fiddling with it*
CREDIT CARDS	REPLACEMENT CARD DURATION	*how long until i get my replacement card*
	REPLACEMENT CARD DURATION	*tell me the duration it takes to get a new cc*
	REPLACEMENT CARD DURATION	*how long will a new card take to come in the mail*
CREDIT CARDS	IMPROVE CREDIT SCORE	*what steps should i take to improve my credit score*
	IMPROVE CREDIT SCORE	*what can i do to raise my credit score*
	IMPROVE CREDIT SCORE	*how do i keep my credit score from dropping*
CREDIT CARDS	EXPIRATION DATE	*how soon does my visa card expire*
	EXPIRATION DATE	*can you tell me if my credit card expires in the near future*
	EXPIRATION DATE	*can you please tell me my card's expiration month*

Table 3: Sample queries from the **CREDIT CARDS** domain.

Domain	Intent	Query
KITCHEN & DINING	RECIPE	*find a recipe for baked ziti*
	RECIPE	*how do i make lasagna*
	RECIPE	*show me how to make tuna casserole please*
KITCHEN & DINING	RESTAURANT REVIEWS	*do you know how the ratings are for yardhouse*
	RESTAURANT REVIEWS	*i need to know if boston restaurant has favorable reviews*
	RESTAURANT REVIEWS	*how are people liking the sushi at yakamoto*
KITCHEN & DINING	CALORIES	*what kind of calories do chicken tenders have*
	CALORIES	*how many calories can i expect to be in fries*
	CALORIES	*tell me how many calories in a medium size apple*
KITCHEN & DINING	NUTRITION INFO	*tell me the nutrional info of a regular banana*
	NUTRITION INFO	*how healthy is rice*
	NUTRITION INFO	*i would like nutrition facts for spaghetti carbonara*
KITCHEN & DINING	RESTAURANT SUGGESTION	*can you suggest a restaurant for me to eat tonight*
	RESTAURANT SUGGESTION	*what's a good place to eat chinese in san francisco*
	RESTAURANT SUGGESTION	*i want sushi, is there any good place in ho chi minh*
KITCHEN & DINING	INGREDIENTS LIST	*tell me what ingredients i need for carne asada*
	INGREDIENTS LIST	*what do you put in chicken noodle casserole*
	INGREDIENTS LIST	*what all is in gumbo*
KITCHEN & DINING	INGREDIENT SUBSTITUTION	*can i swap chili for sloppy joe mix in the recipe*
	INGREDIENT SUBSTITUTION	*is it possible to use starch instead of flour*
	INGREDIENT SUBSTITUTION	*can i substitute butter for oil*
KITCHEN & DINING	COOK TIME	*how long should i cook pho for*
	COOK TIME	*i need to know how long to do a pot roast in a slow cooker*
	COOK TIME	*how long does it take to cook ham*
KITCHEN & DINING	FOOD LAST	*how long can i freeze tofu before it goes bad*
	FOOD LAST	*milk will go bad in my fridge when*
	FOOD LAST	*is cooked chicken still good after being refrigerated for two weeks*
KITCHEN & DINING	MEAL SUGGESTION	*i would like you to give me a suggestion for a mexican meal*
	MEAL SUGGESTION	*i need to quick dinner suggestions*
	MEAL SUGGESTION	*can you tell me a good indian dish to make*
KITCHEN & DINING	RESTAURANT RESERVATION	*i need a table for 3 at olive garden for 7*
	RESTAURANT RESERVATION	*are there any open reservations at outback tonight*
	RESTAURANT RESERVATION	*i want to have a table for 2 at the broadmore around 6*
KITCHEN & DINING	CONFIRM RESERVATION	*check on my reservation for umami at 6pm*
	CONFIRM RESERVATION	*do you know if my reservation for dono is confirmed at 8 pm*
	CONFIRM RESERVATION	*will you check there is a reservation for laura at black pearl*
KITCHEN & DINING	HOW BUSY	*what's the table wait at applebees*
	HOW BUSY	*how busy is zippy around 12 for lunch*
	HOW BUSY	*is kaya very busy at 5 pm*
KITCHEN & DINING	CANCEL RESERVATION	*cancel my party reservation for brad at longhorn*
	CANCEL RESERVATION	*i need to cancel my dinner reservation*
	CANCEL RESERVATION	*cancel my reservation for 5 at the loft*
KITCHEN & DINING	ACCEPT RESERVATIONS	*does village inn let you make reservations*
	ACCEPT RESERVATIONS	*eleven madison park takes reservations right*
	ACCEPT RESERVATIONS	*find out of grub burger takes reservations*

Table 4: Sample queries from the KITCHEN & DINING domain.

Domain	Intent	Query
HOME	SHOPPING LIST	*does my shopping list have pop tarts*
	SHOPPING LIST	*are carrots added to the grocery list*
	SHOPPING LIST	*let me know what's on my shopping list*
HOME	SHOPPING LIST UPDATE	*please add bananas to my shopping list unless i already did*
	SHOPPING LIST UPDATE	*cross out bananas from my shopping list and put papayas on it, please*
	SHOPPING LIST UPDATE	*i'm out of paper towels so will you put that on my shopping list*
HOME	NEXT SONG	*please play the next song*
	NEXT SONG	*please put on the next number on this playlist*
	NEXT SONG	*move to the next song*
HOME	PLAY MUSIC	*i need for you to play my maroon 5 playlist*
	PLAY MUSIC	*can you play some music by the beatles for me*
	PLAY MUSIC	*start up some music*
HOME	UPDATE PLAYLIST	*add this tune to my jazz playlist*
	UPDATE PLAYLIST	*please add roar by katy perry to my playlist*
	UPDATE PLAYLIST	*put what i'm listening to on my workout playlist*
HOME	TODO LIST	*is my todo list free*
	TODO LIST	*is cleaning the garage on my to do list*
	TODO LIST	*is vacuuming on my list of things to do*
HOME	TODO LIST UPDATE	*i don't need mowing the lawn on my to do list anymore*
	TODO LIST UPDATE	*empty the contents of my to do list*
	TODO LIST UPDATE	*add grocery shopping to my to do list*
HOME	CALENDAR	*do i have my nephew's birthday marked for november 10th*
	CALENDAR	*have i added my doctor's appointment to my calendar*
	CALENDAR	*retrieve events on my calendar*
HOME	CALENDAR UPDATE	*clear my calendar on feb 28*
	CALENDAR UPDATE	*mark my calendar that i will be meeting steven on march 5*
	CALENDAR UPDATE	*friday needs to be clear on my calendar*
HOME	WHAT SONG	*name this song*
	WHAT SONG	*i need this song title*
	WHAT SONG	*who is this song that's on the stereo*
HOME	ORDER	*can you please order me more plastic bags*
	ORDER	*could you get everything on my shopping list*
	ORDER	*can you go to amazon a repurchase my last purchase*
HOME	ORDER STATUS	*can you monitor my package's progress*
	ORDER STATUS	*i need to track my order*
	ORDER STATUS	*have my goods been delivered yet*
HOME	REMINDER	*tell me my reminders*
	REMINDER	*do i have a reminder for our neighbor's anniversary*
	REMINDER	*i wanted to remember what again*
HOME	REMINDER UPDATE	*remind me to call my mother saturday morning*
	REMINDER UPDATE	*can you set me a reminder*
	REMINDER UPDATE	*set a reminder to go dress shopping*
HOME	SMART HOME	*can you please turn on my furnace*
	SMART HOME	*can you turn the oven to 350*
	SMART HOME	*did i lock the doors*

Table 5: Sample queries from the **HOME** domain.

Domain	Intent	Query
AUTO & COMMUTE	TRAFFIC	*is there much traffic between here and work right now*
	TRAFFIC	*is there traffic on dove road*
	TRAFFIC	*is there gridlock on the street up to the stadium*
AUTO & COMMUTE	DIRECTIONS	*how do i get to the train by foot*
	DIRECTIONS	*find the closest cvs near galleria mall*
	DIRECTIONS	*where is the closest subway entrance to me to go to brooklyn*
AUTO & COMMUTE	GAS	*is my gas tank full or empty*
	GAS	*how long before i'm on e*
	GAS	*what level is my gas tank at*
AUTO & COMMUTE	GAS TYPE	*can you tell me what gas this car takes*
	GAS TYPE	*what is the proper fuel type for my car*
	GAS TYPE	*what kind of gas does my car need*
AUTO & COMMUTE	DISTANCE	*how long will it take to walk to the safeway in the strip mall*
	DISTANCE	*tell me how far i am from home in time and miles*
	DISTANCE	*how long will it take to get to phoenix*
AUTO & COMMUTE	CURRENT LOCATION	*what's my location*
	CURRENT LOCATION	*list my current gps coordinates*
	CURRENT LOCATION	*help me find where i am*
AUTO & COMMUTE	MPG	*what is my car's mpg*
	MPG	*what is the gas mileage of my car*
	MPG	*how is the car's fuel economy*
AUTO & COMMUTE	OIL CHANGE WHEN	*when is the next time i need to get an oil change*
	OIL CHANGE WHEN	*is my oil change coming up soon*
	OIL CHANGE WHEN	*when does this car need oil changes*
AUTO & COMMUTE	OIL CHANGE HOW	*procedure to change oil in car*
	OIL CHANGE HOW	*i want to know how to change my oil*
	OIL CHANGE HOW	*can you find some instructions on how to change my oil*
AUTO & COMMUTE	JUMP START	*how can i jump start my car if my battery is dead*
	JUMP START	*can i get my car jumped for this dead battery*
	JUMP START	*my car battery died, what should i do*
AUTO & COMMUTE	UBER	*find me an uber to the liberty bell*
	UBER	*i need an uber for 5 to go to the concerthall*
	UBER	*i'm too drunk to drive and need an uber home*
AUTO & COMMUTE	SCHEDULE MAINTENANCE	*my car needs maintenance schedulede*
	SCHEDULE MAINTENANCE	*my check engine light is on and someone needs to look at it*
	SCHEDULE MAINTENANCE	*is there a location i can schedule to check out my tires*
AUTO & COMMUTE	LAST MAINTENANCE	*can you find the date of my last oil change*
	LAST MAINTENANCE	*tell me when someone looked at my car last*
	LAST MAINTENANCE	*i need to know the date of my car's last visit to the shop please*
AUTO & COMMUTE	TIRE PRESSURE	*give me the tire pressure for the car*
	TIRE PRESSURE	*my tires are how low on air*
	TIRE PRESSURE	*are my tires filled enough*
AUTO & COMMUTE	TIRE CHANGE	*when is the next time i should get my tires changed*
	TIRE CHANGE	*on feb 3rd i changed my tires are they still good*
	TIRE CHANGE	*when is it time for a change in tires*

Table 6: Sample queries from the AUTO & COMMUTE domain.

Domain	Intent	Query
TRAVEL	BOOK FLIGHT	*book a flight to los angeles from las vegas on american airlines*
	BOOK FLIGHT	*i need a flight for under 300 from pittsburgh to atlanta*
	BOOK FLIGHT	*book a flight from philadelphia to atlanta on june 5th and returning on june 8th*
TRAVEL	BOOK HOTEL	*i need a room in indianapolis near the track from may 2nd through the 5th*
	BOOK HOTEL	*make a reservation to stay in cali from november 11 to 15*
	BOOK HOTEL	*please book me a room in austin from tomorrow to the 2nd*
TRAVEL	CAR RENTAL	*i want to reserve a convertible from july 2nd through july 18th for los angeles*
	CAR RENTAL	*please help me book a rental car for nashville*
	CAR RENTAL	*i need a rental car for sfo from friday to saturday*
TRAVEL	TRAVEL SUGGESTION	*what are some interesting things i can do while in raleigh*
	TRAVEL SUGGESTION	*i want to know about tourist places for bangkok*
	TRAVEL SUGGESTION	*what are some fun cheap activities to do in colorado*
TRAVEL	TRAVEL ALERT	*does macedonia have any travel alerts i should be aware of*
	TRAVEL ALERT	*tell me about any travel alerts issued for germany*
	TRAVEL ALERT	*argentina travel alert yes or no*
TRAVEL	TRAVEL NOTIFICATION	*i need to let my bank know i am traveling to paris*
	TRAVEL NOTIFICATION	*inform my bank that i'll be going to europe*
	TRAVEL NOTIFICATION	*let my bank know i will be on travel to fes*
TRAVEL	CARRY ON	*i am flying to finland and wanna know the carry-on rules*
	CARRY ON	*tell me the the carry-on restrictions for american airlines*
	CARRY ON	*does more than one carry on cost extra at ryanair*
TRAVEL	TIMEZONE	*what is the time zone of france*
	TIMEZONE	*what timezone is philadelphia in*
	TIMEZONE	*miami time zone is what*
TRAVEL	VACCINES	*do i need any vaccinations before going to indonesia*
	VACCINES	*should i get any shots before i go to kenya*
	VACCINES	*are shots needed for uk travel*
TRAVEL	TRANSLATE	*how does one say wonderful in german*
	TRANSLATE	*how do you say please in french*
	TRANSLATE	*how would i say i am lost if i were japanese*
TRAVEL	FLIGHT STATUS	*what's the status of my virgin airlines flight*
	FLIGHT STATUS	*when is my flight scheduled to board*
	FLIGHT STATUS	*at what time is my flight scheduled to land*
TRAVEL	INTERNATIONAL VISA	*do i need an international visa to get into italy*
	INTERNATIONAL VISA	*does the uk require a travel visa*
	INTERNATIONAL VISA	*i need to know if i need a visa to travel to el salvador*
TRAVEL	LOST LUGGAGE	*there are some questionable charges on my card*
	LOST LUGGAGE	*there's a shady charge from comcast on my account*
	LOST LUGGAGE	*i need to report fraudulent activity on my card*
TRAVEL	PLUG TYPE	*what would be the best way to deal with lost luggage*
	PLUG TYPE	*what should i do about losing my luggage*
	PLUG TYPE	*my luggage is missing off of american airlines flight ab123 out of chicago*
TRAVEL	EXCHANGE RATE	*how much is 100 dollars in euros*
	EXCHANGE RATE	*how much is usd vs cad*
	EXCHANGE RATE	*tell me the exchange rate between rubles and dollars*

Table 7: Sample queries from the **TRAVEL** domain.

Domain	Intent	Query
UTILITY	TIME	*please give me the time in tanzania at this moment*
	TIME	*what is the current time*
	TIME	*what's the clock say*
UTILITY	ALARM	*please set me an alarm*
	ALARM	*can you set up alarms for one in the afternoon and ten at night*
	ALARM	*set alarm*
UTILITY	SHARE LOCATION	*share my location with brad and terry*
	SHARE LOCATION	*let coach know where i am*
	SHARE LOCATION	*how do i share my location with noel*
UTILITY	FIND PHONE	*can you help me locate my phone*
	FIND PHONE	*can you find my phone*
	FIND PHONE	*tell me where i left my phone*
UTILITY	WEATHER	*tell me the forecast*
	WEATHER	*is it going to rain tomorrow*
	WEATHER	*how cold is it in wisconsin today*
UTILITY	TEXT	*please send a text to danny saying that i'm running late*
	TEXT	*i need leslie to be texted saying have a good day*
	TEXT	*send a text to mom saying i'm on my way*
UTILITY	SPELLING	*how do you spell out espresso*
	SPELLING	*tell me how handkerchief is spelled*
	SPELLING	*tell how many a's are in the word happiness*
UTILITY	MAKE CALL	*dial up dominos pizza*
	MAKE CALL	*i need you to phone sal*
	MAKE CALL	*call mom*
UTILITY	TIMER	*set the timer for 10 minutes*
	TIMER	*set 60 minutes for oven please*
	TIMER	*i want a timer set*
UTILITY	DATE	*i would like to know what today's date is*
	DATE	*current date*
	DATE	*tell me what day it is*
UTILITY	CALCULATOR	*what is 300 divided by 42*
	CALCULATOR	*find square root of 453*
	CALCULATOR	*add up 8 and 7*
UTILITY	MEASUREMENT CONVERSION	*what is the total number of pints in two quarts*
	MEASUREMENT CONVERSION	*how many ounces in a liter*
	MEASUREMENT CONVERSION	*what's 8 ounces in cups*
UTILITY	FLIP COIN	*can you flip a coin for me*
	FLIP COIN	*throw a coin in the air*
	FLIP COIN	*flip a coin, i call heads*
UTILITY	ROLL DICE	*roll a dice that has seven sides*
	ROLL DICE	*roll a die please*
	ROLL DICE	*will you roll a d20*
UTILITY	DEFINITION	*define antebellum*
	DEFINITION	*what does circuitous mean*
	DEFINITION	*can you tell me what obsolescence means*

Table 8: Sample queries from the **UTILITY** domain.

Domain	Intent	Query
WORK	DIRECT DEPOSIT	*how do i set up a direct deposit*
	DIRECT DEPOSIT	*how to activate direct deposit to chase account*
	DIRECT DEPOSIT	*what information do i need to direct deposit my paycheck*
WORK	PTO REQUEST	*how do i put in a pto request for the first to the ninth*
	PTO REQUEST	*how do i schedule vacation days*
	PTO REQUEST	*may i take a pto on february 7 and 8*
WORK	TAXES	*how much do i owe for state taxes*
	TAXES	*do i pay a lot of taxes on my income*
	TAXES	*how much will i pay in federal taxes*
WORK	PAYDAY	*how long until my paycheck shows up*
	PAYDAY	*when did i last collect my salary*
	PAYDAY	*when do i get paid for my work*
WORK	W2	*where can i get my w2 from*
	W2	*where do i go to get that work tax form thing*
	W2	*how can i get get a copy of my w2 for tax purposes*
WORK	PTO BALANCE	*how many vacation days do i still have available*
	PTO BALANCE	*what do my vacation days amount to*
	PTO BALANCE	*how many pto days do i have left*
WORK	PTO REQUEST STATUS	*does my vacation have approval*
	PTO REQUEST STATUS	*please let me know the status of my vacation request*
	PTO REQUEST STATUS	*any news for me regarding my day off request*
WORK	NEXT HOLIDAY	*when is the next scheduled holiday*
	NEXT HOLIDAY	*when is the next office holiday*
	NEXT HOLIDAY	*when can i expect my next day off*
WORK	INSURANCE	*what health benefits can i use*
	INSURANCE	*what benefits are provided by my insurance*
	INSURANCE	*i'm curious what health plan i'm on*
WORK	INSURANCE CHANGE	*i would like to change my insurance policy*
	INSURANCE CHANGE	*help me change my insurance plan*
	INSURANCE CHANGE	*i would like to change my insurance policy*
WORK	SCHEDULE MEETING	*tell me how i can schedule a meeting*
	SCHEDULE MEETING	*please help me schedule a meeting with john love at 9 am tomorrow*
	SCHEDULE MEETING	*would you be able to help me with a meeting room on wednesday at 3pm*
WORK	PTO USED	*what is the total number of days that i have taken off work since january*
	PTO USED	*how much of my pto is gone*
	PTO USED	*i want to know how many vacation days i have used*
WORK	MEETING SCHEDULE	*are there meetings scheduled for today*
	MEETING SCHEDULE	*are there meetings from 1 to 5 pm*
	MEETING SCHEDULE	*my meeting with alice is scheduled for when*
WORK	ROLLOVER 401K	*is it possible to rollover my 401k*
	ROLLOVER 401K	*401k rollover help*
	ROLLOVER 401K	*explain to me how transferring my 401k works*
WORK	INCOME	*please give me my salary figure*
	INCOME	*what is the total amount of my paychecks over the last year*
	INCOME	*how much do i make every 2 weeks*

Table 9: Sample queries from the WORK domain.

Domain	Intent	Query
SMALL TALK	GREETING	*how are you doing*
	GREETING	*it is good to see you*
	GREETING	*hey what's up*
SMALL TALK	GOODBYE	*glad we got to talk*
	GOODBYE	*talk to you later*
	GOODBYE	*adios*
SMALL TALK	TELL JOKE	*what's a good joke*
	TELL JOKE	*i want to hear something funny*
	TELL JOKE	*can you tell me a joke about politicians*
SMALL TALK	WHERE ARE YOU FROM	*from where do you come*
	WHERE ARE YOU FROM	*where do you call home*
	WHERE ARE YOU FROM	*in what place are you originally from*
SMALL TALK	HOW OLD ARE YOU	*may i ask your age*
	HOW OLD ARE YOU	*what do people call you*
	HOW OLD ARE YOU	*can i have your name*
SMALL TALK	WHAT IS YOUR NAME	*what was your name again*
	WHAT IS YOUR NAME	*read my bill balances*
	WHAT IS YOUR NAME	*how much do i owe for my gas and phone bills*
SMALL TALK	WHO MADE YOU	*who is your maker*
	WHO MADE YOU	*which company were you designed by*
	WHO MADE YOU	*who were you created by*
SMALL TALK	THANK YOU	*thanks for helping me*
	THANK YOU	*i appreciate you doing that*
	THANK YOU	*special thanks to you*
SMALL TALK	WHAT CAN I ASK YOU	*what kinds of questions can you answer*
	WHAT CAN I ASK YOU	*what topics can i ask you about*
	WHAT CAN I ASK YOU	*how can you help me*
SMALL TALK	WHAT ARE YOUR HOBBIES	*what are your hobbies in life*
	WHAT ARE YOUR HOBBIES	*do you have hobbies*
	WHAT ARE YOUR HOBBIES	*what do you like to do during your leisure time*
SMALL TALK	DO YOU HAVE PETS	*what type of pet do you have*
	DO YOU HAVE PETS	*tell me about your pets*
	DO YOU HAVE PETS	*what animals do you have*
SMALL TALK	ARE YOU A BOT	*are your real or artificial*
	ARE YOU A BOT	*are you actually a bot*
	ARE YOU A BOT	*are you a living being*
SMALL TALK	MEANING OF LIFE	*i want to know the meaning of life*
	MEANING OF LIFE	*what's life mean to you*
	MEANING OF LIFE	*do you know the deeper meaning of life*
SMALL TALK	WHO DO YOU WORK FOR	*who do you say you work for*
	WHO DO YOU WORK FOR	*who is the boss of you*
	WHO DO YOU WORK FOR	*who pay your salary*
SMALL TALK	FUN FACT	*tell me a fun fact about cars*
	FUN FACT	*tell me today's fun fact*
	FUN FACT	*what's something interesting about bees*

Table 10: Sample queries from the **SMALL TALK** domain.

Domain	Intent	Query
META	CHANGE AI NAME	*rename yourself to betty*
	CHANGE AI NAME	*change your name setting to plato*
	CHANGE AI NAME	*how do i change the name you came with to something else*
META	CHANGE USER NAME	*bob is my name now*
	CHANGE USER NAME	*could you call me a different name*
	CHANGE USER NAME	*call me mike from now on*
META	CANCEL	*stop this process*
	CANCEL	*stop talking*
	CANCEL	*command cancel*
META	USER NAME	*you refer to me as what*
	USER NAME	*say my name if you know it*
	USER NAME	*how did you save my name*
META	RESET SETTINGS	*make the settings go back to the original*
	RESET SETTINGS	*go back to factory settings please*
	RESET SETTINGS	*do a hard reset*
META	WHISPER MODE	*switch off whisper mode*
	WHISPER MODE	*start whisper mode*
	WHISPER MODE	*change sound setting to whisper*
META	REPEAT	*repeat that for me*
	REPEAT	*please say that again*
	REPEAT	*i'm sorry please repeat the question*
META	NO	*hell nah*
	NO	*no good*
	NO	*absolutely not*
META	YES	*yep*
	YES	*that is affirmative*
	YES	*correct*
META	MAYBE	*i'm not actually sure*
	MAYBE	*perhaps*
	MAYBE	*maybe it does*
META	CHANGE LANGUAGE	*switch the language setting over to german*
	CHANGE LANGUAGE	*i want you to speak in french*
	CHANGE LANGUAGE	*please respond in english*
META	CHANGE ACCENT	*could you use a male voice*
	CHANGE ACCENT	*go ahead and switch to the female voice*
	CHANGE ACCENT	*please change your accent to the male british one*
META	CHANGE VOLUME	*raise the volume to 4 please*
	CHANGE VOLUME	*please increase your speaker volume*
	CHANGE VOLUME	*can you turn this down*
META	CHANGE SPEED	*can i speed up your voiced*
	CHANGE SPEED	*can you speak faster*
	CHANGE SPEED	*your speech slower it*
META	SYNC DEVICE	*can you connect to my phone*
	SYNC DEVICE	*don't be synced to my phone anymore*
	SYNC DEVICE	*unsync from my phone please*

Table 11: Sample queries from the **META** domain.

Domain	Intent	Query
OUT-OF-SCOPE	OUT-OF-SCOPE	*how much has the dow changed today*
OUT-OF-SCOPE	OUT-OF-SCOPE	*how many prime numbers are there between 0 and 100*
OUT-OF-SCOPE	OUT-OF-SCOPE	*how is my driving*
OUT-OF-SCOPE	OUT-OF-SCOPE	*what is the best way to clean ceiling fans*
OUT-OF-SCOPE	OUT-OF-SCOPE	*can you auto-pilot the car*
OUT-OF-SCOPE	OUT-OF-SCOPE	*do i have overdraft protection*
OUT-OF-SCOPE	OUT-OF-SCOPE	*i need to update my address*
OUT-OF-SCOPE	OUT-OF-SCOPE	*go and check the fridge*
OUT-OF-SCOPE	OUT-OF-SCOPE	*who invented custardo*
OUT-OF-SCOPE	OUT-OF-SCOPE	*open up internet browser*
OUT-OF-SCOPE	OUT-OF-SCOPE	*where did abraham lincoln live*
OUT-OF-SCOPE	OUT-OF-SCOPE	*get me dwight howard shooting average*
OUT-OF-SCOPE	OUT-OF-SCOPE	*are any justice league movies coming out*
OUT-OF-SCOPE	OUT-OF-SCOPE	*please explain the catch rule to me*
OUT-OF-SCOPE	OUT-OF-SCOPE	*how long does it take the irs to issue a tax refund*
OUT-OF-SCOPE	OUT-OF-SCOPE	*are androids expensive*
OUT-OF-SCOPE	OUT-OF-SCOPE	*what cryptocurrency gained the most in 2018*
OUT-OF-SCOPE	OUT-OF-SCOPE	*do ducks eat meat, vegetables, or both*
OUT-OF-SCOPE	OUT-OF-SCOPE	*how can i use make up to cover a cut on my cheek*
OUT-OF-SCOPE	OUT-OF-SCOPE	*set a warning for when my bank account starts running low*
OUT-OF-SCOPE	OUT-OF-SCOPE	*am kind of busy now*
OUT-OF-SCOPE	OUT-OF-SCOPE	*how to unclog a drain*
OUT-OF-SCOPE	OUT-OF-SCOPE	*what size wipers does this car take*
OUT-OF-SCOPE	OUT-OF-SCOPE	*what are some ways to reduce spending*
OUT-OF-SCOPE	OUT-OF-SCOPE	*where does jelly come from*
OUT-OF-SCOPE	OUT-OF-SCOPE	*is yoga healthy*
OUT-OF-SCOPE	OUT-OF-SCOPE	*are hawks domesticated or wild*
OUT-OF-SCOPE	OUT-OF-SCOPE	*do you know if it is possible to close my savings account*
OUT-OF-SCOPE	OUT-OF-SCOPE	*what languages are considered semitic*
OUT-OF-SCOPE	OUT-OF-SCOPE	*how do you know if a mushroom is edible*
OUT-OF-SCOPE	OUT-OF-SCOPE	*is va treatment free for veterans*
OUT-OF-SCOPE	OUT-OF-SCOPE	*is the bachelor on tonight*
OUT-OF-SCOPE	OUT-OF-SCOPE	*what is npr reporting on right now*
OUT-OF-SCOPE	OUT-OF-SCOPE	*change my seat to an window seat for my flight on monday*
OUT-OF-SCOPE	OUT-OF-SCOPE	*please save my draft for me so i can work on it later*
OUT-OF-SCOPE	OUT-OF-SCOPE	*which state has the best airlines*
OUT-OF-SCOPE	OUT-OF-SCOPE	*can you forward this email to my boss*
OUT-OF-SCOPE	OUT-OF-SCOPE	*how do you store my card information*
OUT-OF-SCOPE	OUT-OF-SCOPE	*can you clock me in*
OUT-OF-SCOPE	OUT-OF-SCOPE	*how many students attend ucsb*
OUT-OF-SCOPE	OUT-OF-SCOPE	*how can i get involved in restaurant marketing*
OUT-OF-SCOPE	OUT-OF-SCOPE	*how do the anti-lock brakes work*
OUT-OF-SCOPE	OUT-OF-SCOPE	*why can't you divide by zero*
OUT-OF-SCOPE	OUT-OF-SCOPE	*show me all contacts*
OUT-OF-SCOPE	OUT-OF-SCOPE	*can you show me my 3-digit credit card verification number*

Table 12: Sample **OUT-OF-SCOPE** queries.

are barcode symbologies specifically designed for this application
virtually all solidarity leaders and many affiliated intellectuals were arrested or detained
kimuras own hq left by land
fitzgerald had inferred this hypothesis from a paper by oliver heaviside
asbury wrote in his journal
the christmas season immediately follows advent
he and trinity are now lovers
her distinctive voice and persona are frequently parodied
cattle ranchers later feuded and discouraged the wandering sheepherders
the ground substance is mostly made up of chondroitin sulfate and osteocalcin
it has about 5000 inhabitants
gibson township is a township in cameron county pennsylvania pennsylvania united states
in august 1974 the tigers sold northrup to the montreal expos
the danish distillery aalborg makes an akvavit distilled with amber
the line will be extended only with substantial additional government funding
though only serving for five years whitlock was very influential to simons rock development

Table 13: Examples from the data used in the wiki aug *oos-binary* approach.