slot and intent

data

atis

数据特点：长尾分布，意图和槽位混合分布

样本个数：train：4478, test：893, dev:500.

样本长度：最长46，最短1，平均12

槽位和意图情况：

意图(21类)：

[atis_abbreviation, atis_aircraft, atis_aircraft#atis_flight#atis_flight_no, atis_airfare，atis_airline, atis_airline#atis_flight_no, atis_airport，atis_capacity, atis_cheapest，atis_city, atis_distance, atis_flight, atis_flight#atis_airfare，atis_flight_no，atis_flight_time, atis_ground_fare，atis_ground_service, atis_ground_service#atis_ground_fare，atis_meal, atis_quantity，atis_restriction]

槽位(83类)：

{
'atis_flight': ['aircraft_code', 'airline_code', 'airline_name', 'airport_code', 'airport_name', 'arrive_date.date_relative',
        'arrive_date.day_name', 'arrive_date.day_number', 'arrive_date.month_name', 'arrive_date.today_relative', 'arrive_time.end_time',
        'arrive_time.period_mod', 'arrive_time.period_of_day', 'arrive_time.start_time', 'arrive_time.time', 'arrive_time.time_relative',
        'city_name', 'class_type', 'compartment', 'connect', 'cost_relative', 'day_name', 'depart_date.date_relative', 'depart_date.day_name',
        'depart_date.day_number', 'depart_date.month_name', 'depart_date.today_relative', 'depart_date.year', 'depart_time.end_time',
        'depart_time.period_mod', 'depart_time.period_of_day', 'depart_time.start_time', 'depart_time.time', 'depart_time.time_relative',
        'economy', 'fare_amount', 'fare_basis_code', 'flight', 'flight_days', 'flight_mod', 'flight_number', 'flight_stop', 'flight_time',
        'fromloc.airport_code', 'fromloc.airport_name', 'fromloc.city_name', 'fromloc.state_code', 'fromloc.state_name', 'meal',
        'meal_description', 'mod', 'or', 'period_of_day', 'return_date.date_relative', 'return_date.day_name', 'return_date.day_number',
        'return_date.month_name', 'return_date.today_relative', 'return_time.period_mod', 'return_time.period_of_day', 'round_trip',
        'stoploc.airport_code', 'stoploc.airport_name', 'stoploc.city_name', 'stoploc.state_code', 'toloc.airport_code', 'toloc.airport_name',
        'toloc.city_name', 'toloc.country_name', 'toloc.state_code', 'toloc.state_name'],
'atis_airfare': ['aircraft_code', 'airline_code', 'airline_name', 'arrive_date.date_relative',
        'arrive_date.day_name', 'arrive_date.day_number', 'arrive_date.month_name', 'arrive_time.time', 'arrive_time.time_relative',
        'class_type', 'connect', 'cost_relative', 'depart_date.date_relative', 'depart_date.day_name',

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'depart_date.day_number',
        'depart_date.month_name', 'depart_date.today_relative', 'depart_date.year',
'depart_time.period_mod', 'depart_time.period_of_day',
        'depart_time.time', 'depart_time.time_relative', 'economy', 'fare_amount', 'flight_days',
'flight_mod', 'flight_number', 'flight_stop',
        'flight_time', 'fromloc.airport_code', 'fromloc.airport_name', 'fromloc.city_name',
'fromloc.state_code', 'fromloc.state_name',
        'meal', 'or', 'return_date.day_number', 'return_date.month_name', 'round_trip',
'stoploc.city_name', 'toloc.airport_code',
        'toloc.airport_name', 'toloc.city_name', 'toloc.state_code', 'toloc.state_name'],
'atis_airline': ['aircraft_code', 'airline_code', 'airline_name', 'airport_name',
'arrive_date.day_number', 'arrive_date.month_name',
        'arrive_time.period_of_day', 'arrive_time.time', 'city_name', 'class_type', 'connect',
'cost_relative', 'depart_date.date_relative',
        'depart_date.day_name', 'depart_date.day_number', 'depart_date.month_name',
'depart_date.today_relative', 'depart_time.end_time',
        'depart_time.period_of_day', 'depart_time.start_time', 'depart_time.time',
'depart_time.time_relative', 'flight_days', 'flight_number',
        'flight_stop', 'fromloc.airport_code', 'fromloc.airport_name', 'fromloc.city_name',
'fromloc.state_code', 'mod', 'round_trip',
        'stoploc.city_name', 'toloc.airport_name', 'toloc.city_name', 'toloc.state_code',
'toloc.state_name'],
'atis_ground_service': ['airport_code', 'airport_name', 'city_name', 'day_name', 'day_number',
'depart_date.date_relative',
        'depart_date.day_name', 'depart_date.day_number', 'depart_date.month_name',
'flight_time', 'fromloc.airport_name', 'fromloc.city_name',
        'month_name', 'or', 'period_of_day', 'state_code', 'state_name', 'time', 'time_relative',
'today_relative', 'toloc.airport_name',
        'toloc.city_name', 'transport_type'],
'atis_quantity': ['aircraft_code', 'airline_code', 'airline_name', 'arrive_date.day_number',
'arrive_date.month_name',
        'arrive_time.time', 'arrive_time.time_relative', 'city_name', 'class_type',
'depart_date.day_number', 'depart_date.month_name',
        'depart_date.today_relative', 'depart_time.period_of_day', 'depart_time.time',
'depart_time.time_relative', 'economy', 'fare_basis_code',
        'flight_days', 'flight_number', 'flight_stop', 'fromloc.city_name', 'round_trip',
'stoploc.city_name', 'toloc.airport_name',
        'toloc.city_name'],
'atis_city': ['airline_name', 'airport_code', 'airport_name', 'city_name', 'class_type',
'depart_time.period_of_day',
        'depart_time.time', 'depart_time.time_relative', 'fromloc.airport_code',
'fromloc.city_name', 'toloc.city_name'],
'atis_flight#atis_airfare': ['airline_name', 'arrive_time.time', 'arrive_time.time_relative',
'cost_relative', 'depart_date.date_relative',
        'depart_date.day_name', 'depart_date.day_number', 'depart_date.month_name',
'depart_time.period_of_day', 'depart_time.time',
        'depart_time.time_relative', 'fare_amount', 'flight_mod', 'flight_number', 'flight_stop',
'fromloc.city_name', 'return_date.date_relative',
        'return_date.day_name', 'round_trip', 'toloc.city_name', 'toloc.state_code'],
'atis_abbreviation': ['aircraft_code', 'airline_code', 'airline_name', 'airport_code', 'booking_class',
'class_type', 'days_code',
        'fare_basis_code', 'fromloc.city_name', 'meal', 'meal_code', 'mod', 'restriction_code',
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                    'toloc.city_name'],
'atis_aircraft': ['aircraft_code', 'airline_code', 'airline_name', 'arrive_date.day_name',
'arrive_date.day_number',
            'arrive_date.month_name', 'arrive_time.time', 'arrive_time.time_relative', 'city_name',
'class_type', 'depart_date.day_name',
            'depart_date.day_number', 'depart_date.month_name', 'depart_time.period_of_day',
'depart_time.time', 'depart_time.time_relative',
            'flight_mod', 'flight_number', 'fromloc.city_name', 'mod', 'stoploc.city_name',
'toloc.city_name', 'toloc.state_code'],
'atis_distance': ['airport_name', 'city_name', 'depart_date.day_number',
'depart_date.month_name', 'depart_time.time',
            'fromloc.airport_name', 'fromloc.city_name', 'toloc.city_name'],
'atis_ground_fare': ['airport_name', 'city_name', 'fromloc.airport_name', 'fromloc.city_name',
'toloc.city_name', 'transport_type'],
'atis_capacity': ['aircraft_code', 'airline_name', 'fromloc.city_name', 'mod', 'toloc.city_name'],
'atis_flight_time': ['aircraft_code', 'airline_code', 'airline_name', 'airport_name', 'class_type',
'depart_date.date_relative',
            'depart_date.day_name', 'depart_date.day_number', 'depart_date.month_name',
'depart_time.period_of_day', 'depart_time.time',
            'depart_time.time_relative', 'flight_mod', 'flight_number', 'flight_time',
'fromloc.airport_name', 'fromloc.city_name', 'meal_description',
            'toloc.airport_code', 'toloc.city_name'],
'atis_meal': ['airline_code', 'airline_name', 'arrive_time.time', 'depart_date.day_name',
'depart_time.period_of_day', 'flight_number',
            'fromloc.city_name', 'meal', 'meal_description', 'toloc.airport_code', 'toloc.city_name',
'toloc.state_code'],
'atis_aircraft#atis_flight#atis_flight_no': ['airline_name', 'depart_time.time',
'depart_time.time_relative', 'fromloc.city_name',
            'toloc.city_name'],
'atis_flight_no': ['airline_name', 'arrive_time.time', 'arrive_time.time_relative', 'class_type',
'cost_relative', 'depart_date.day_name',
            'depart_date.day_number', 'depart_date.month_name', 'depart_date.today_relative',
'depart_time.period_of_day', 'depart_time.time',
            'depart_time.time_relative', 'flight_mod', 'flight_number', 'flight_time',
'fromloc.city_name', 'fromloc.state_name', 'or',
            'stoploc.city_name', 'toloc.city_name', 'toloc.state_code', 'toloc.state_name'],
'atis_restriction': ['cost_relative', 'fare_amount', 'fromloc.city_name', 'restriction_code', 'round_trip',
'toloc.city_name'],
'atis_airport': ['airline_name', 'airport_name', 'city_name', 'flight_stop', 'fromloc.city_name', 'mod',
'state_code', 'state_name',
            'toloc.city_name'],
'atis_airline#atis_flight_no': ['arrive_time.time', 'arrive_time.time_relative',
'depart_date.date_relative', 'depart_date.day_number',
            'depart_date.month_name', 'fromloc.city_name', 'toloc.city_name'],
'atis_cheapest': ['cost_relative'],
'atis_ground_service#atis_ground_fare': ['fromloc.airport_name'],
'atis_airfare#atis_flight_time': ['flight_time', 'fromloc.city_name', 'toloc.city_name'],
'atis_day_name': ['fromloc.city_name', 'toloc.city_name'],
'atis_airfare#atis_flight': ['airline_name', 'flight_number', 'fromloc.airport_code',
'toloc.airport_code'],
'atis_flight#atis_airline': ['depart_date.day_name', 'depart_time.time', 'depart_time.time_relative',
'fromloc.city_name',
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          'toloc.city_name'],
'atis_flight_no#atis_airline': ['depart_date.day_name', 'depart_time.time',
'depart_time.time_relative', 'fromloc.city_name',
          'toloc.city_name']}
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train:

意图情况（21）：
{'atis_flight': 3309, 'atis_airfare': 385, 'atis_airline': 139,
 'atis_ground_service': 230, 'atis_quantity': 41,
 'atis_city': 18, 'atis_flight#atis_airfare': 19, 'atis_abbreviation': 130,
 'atis_aircraft': 70, 'atis_distance': 17,
 'atis_ground_fare': 15, 'atis_capacity': 15, 'atis_flight_time': 45,
 'atis_meal': 6, 'atis_aircraft#atis_flight#atis_flight_no': 1,
 'atis_flight_no': 12, 'atis_restriction': 5, 'atis_airport': 17,
 'atis_airline#atis_flight_no': 2, 'atis_cheapest': 1,
 'atis_ground_service#atis_ground_fare': 1}

槽位情况（79）：
{'fromloc.city_name': 3892, 'toloc.city_name': 3919, 'round_trip': 323,
 'cost_relative': 311, 'fare_amount': 46,
 'arrive_date.month_name': 43, 'arrive_date.day_number': 43, 'stoploc.city_name':
 218, 'arrive_time.time_relative': 173,
 'arrive_time.time': 191, 'toloc.state_code': 76, 'meal_description': 49,
 'depart_date.month_name': 339,
 'depart_date.day_number': 355, 'airline_name': 639, 'depart_time.period_of_day':
 521, 'depart_date.day_name': 785,
 'toloc.state_name': 70, 'depart_time.time_relative': 283, 'depart_time.time':
 327, 'toloc.airport_name': 35,
 'depart_date.date_relative': 76, 'or': 59, 'airline_code': 127, 'class_type':
 194, 'fromloc.airport_name': 73,
 'city_name': 204, 'flight_mod': 289, 'meal': 43, 'economy': 34,
 'fare_basis_code': 63, 'depart_date.today_relative': 75,
 'flight_stop': 143, 'airport_code': 25, 'fromloc.state_name': 35, 'connect': 36,
 'arrive_date.day_name': 78,
 'fromloc.state_code': 41, 'arrive_date.today_relative': 1, 'depart_date.year':
 21, 'depart_time.start_time': 24,
 'depart_time.end_time': 24, 'arrive_time.start_time': 18,
 'arrive_time.end_time': 17, 'flight_days': 37, 'mod': 29,
 'flight_number': 78, 'meal_code': 6, 'airport_name': 34, 'transport_type': 40,
 'state_code': 7, 'aircraft_code': 30,
 'toloc.country_name': 3, 'toloc.airport_code': 16, 'return_date.date_relative':
 7, 'flight_time': 59,
 'fromloc.airport_code': 14, 'arrive_time.period_of_day': 51,
 'depart_time.period_mod': 35, 'return_date.day_name': 1,
 'arrive_date.date_relative': 9, 'restriction_code': 21,
 'arrive_time.period_mod': 3, 'period_of_day': 3,
 'stoploc.state_code': 5, 'time': 2, 'today_relative': 2, 'state_name': 1,
 'days_code': 2, 'time_relative': 1,
 'return_date.month_name': 2, 'return_date.day_number': 2,
 'stoploc.airport_name': 1, 'day_name': 3, 'month_name': 2,
 'day_number': 2, 'return_time.period_mod': 2, 'return_time.period_of_day': 2,
 'return_date.today_relative': 1}

dev:

意图情况 (16):
{'atis_flight': 357, 'atis_airfare': 38, 'atis_restriction': 1,
'atis_ground_service': 25, 'atis_abbreviation': 17,
'atis_aircraft': 11, 'atis_airline': 18, 'atis_quantity': 10,
'atis_flight_time': 9, 'atis_distance': 3,
'atis_flight#atis_airfare': 2, 'atis_ground_fare': 3, 'atis_capacity': 1,
'atis_city': 1, 'atis_airport': 3,
'atis_airfare#atis_flight_time': 1}

槽位情况 (67):
{'fromloc.city_name': 434, 'depart_time.time': 42, 'toloc.city_name': 424,
'arrive_time.time': 17,
'arrive_time.period_of_day': 13, 'round_trip': 25, 'airline_name': 62,
'class_type': 23, 'depart_date.month_name': 40,
'depart_date.day_number': 40, 'return_date.month_name': 2,
'return_date.day_number': 2, 'flight_mod': 40,
'meal_description': 8, 'depart_time.start_time': 1, 'depart_time.end_time': 1,
'toloc.state_name': 7,
'depart_time.period_of_day': 72, 'cost_relative': 33, 'toloc.state_code': 10,
'toloc.airport_name': 4,
'depart_time.time_relative': 40, 'return_time.period_of_day': 1,
'stoploc.city_name': 21, 'restriction_code': 2,
'city_name': 23, 'airline_code': 9, 'depart_date.date_relative': 6,
'depart_date.day_name': 104, 'flight_stop': 25,
'arrive_time.time_relative': 14, 'fromloc.airport_name': 16, 'flight_time': 12,
'day_name': 2, 'period_of_day': 2,
'return_date.date_relative': 3, 'arrive_date.month_name': 4,
'arrive_date.day_number': 4, 'fare_amount': 7,
'arrive_date.today_relative': 1, 'transport_type': 8, 'depart_date.year': 4,
'aircraft_code': 1, 'depart_time.period_mod': 9,
'depart_date.today_relative': 9, 'arrive_time.start_time': 3,
'arrive_time.end_time': 3, 'arrive_date.day_name': 10,
'arrive_time.period_mod': 1, 'airport_code': 4, 'or': 7, 'fromloc.state_code':
5, 'fare_basis_code': 13, 'toloc.airport_code': 4,
'flight_number': 6, 'meal': 3, 'connect': 4, 'fromloc.state_name': 4,
'flight_days': 2, 'airport_name': 4,
'fromloc.airport_code': 1, 'arrive_date.date_relative': 2, 'economy': 2,
'days_code': 1, 'state_code': 1, 'state_name': 1, 'mod': 1}

test:

意图情况 (20):
{'atis_flight': 632, 'atis_airfare': 48, 'atis_flight#atis_airfare': 12,
'atis_ground_service': 36, 'atis_day_name': 2,
'atis_meal': 6, 'atis_airport': 18, 'atis_airline': 38, 'atis_flight_time': 1,
'atis_city': 6, 'atis_ground_fare': 7,
'atis_quantity': 3, 'atis_abbreviation': 33, 'atis_distance': 10,
'atis_aircraft': 9, 'atis_airfare#atis_flight': 1,
'atis_capacity': 21, 'atis_flight#atis_airline': 1,
'atis_flight_no#atis_airline': 1, 'atis_flight_no': 8}

槽位情况 (69):
{'fromloc.city_name': 704, 'toloc.city_name': 716, 'stoploc.city_name': 20,
'depart_date.month_name': 56,
'depart_date.day_number': 55, 'depart_time.time_relative': 65,
'depart_time.time': 57, 'round_trip': 73,

'airline_name': 101, 'depart_date.day_name': 212, 'depart_time.period_of_day':
130, 'meal_description': 10,
'depart_date.date_relative': 17, 'arrive_time.time_relative': 31,
'arrive_time.time': 34, 'return_date.day_name': 2,
'arrive_date.date_relative': 2, 'arrive_date.day_name': 11, 'flight_stop': 21,
'depart_date.today_relative': 9,
'toloc.state_name': 28, 'arrive_date.month_name': 6, 'arrive_date.day_number':
6, 'arrive_time.start_time': 8,
'arrive_time.end_time': 8, 'airport_name': 21, 'connect': 6,
'fromloc.airport_name': 12, 'meal': 16, 'flight_number': 11,
'return_date.date_relative': 3, 'arrive_time.period_of_day': 6,
'fromloc.state_name': 17, 'city_name': 57,
'cost_relative': 37, 'flight_time': 1, 'flight_mod': 24, 'class_type': 24,
'airline_code': 34, 'toloc.airport_code': 4,
'transport_type': 10, 'depart_time.start_time': 3, 'depart_time.end_time': 3,
'toloc.airport_name': 3, 'aircraft_code': 33,
'toloc.country_name': 1, 'mod': 2, 'state_name': 9, 'compartment': 1,
'meal_code': 1, 'day_name': 2, 'toloc.state_code': 18,
'fromloc.state_code': 23, 'depart_time.period_mod': 5, 'fromloc.airport_code':
5, 'fare_basis_code': 17, 'flight_days': 10,
'depart_date.year': 3, 'period_of_day': 4, 'state_code': 1, 'restriction_code':
4, 'airport_code': 9, 'days_code': 1,
'or': 3, 'stoploc.airport_code': 1, 'economy': 6, 'booking_class': 1,
'fare_amount': 2, 'flight': 1}

snips

数据特点：长尾分布，意图和槽位混合分布

样本个数：train：13084, test：700, dev:700.

样本长度：最长35，最短2，平均9

槽位和意图情况：

意图(7类)：

[AddToPlaylist, BookRestaurant, GetWeather, PlayMusic, RateBook, SearchCreativeWork, SearchScreeningEvent]

槽位(39类):

{'PlayMusic': ['album', 'artist', 'genre', 'music_item', 'playlist', 'service', 'sort', 'track', 'year'],
'AddToPlaylist': ['artist', 'entity_name', 'music_item', 'playlist', 'playlist_owner'],
'RateBook': ['best_rating', 'object_name', 'object_part_of_series_type', 'object_select', 'object_type', 'rating_unit', 'rating_value'],
'SearchScreeningEvent': ['location_name', 'movie_name', 'movie_type', 'object_location_type', 'object_type', 'spatial_relation', 'timeRange'],
'BookRestaurant': ['city', 'country', 'cuisine', 'facility', 'party_size_description', 'party_size_number', 'poi', 'restaurant_name',
        'restaurant_type', 'served_dish', 'sort', 'spatial_relation', 'state', 'timeRange'],
'GetWeather': ['city', 'condition_description', 'condition_temperature', 'country', 'current_location', 'geographic_poi',
        'spatial_relation', 'state', 'timeRange'],
'SearchCreativeWork': ['object_name', 'object_type']}

train:

意图情况（7）：
{'PlayMusic': 1914, 'AddToPlaylist': 1818, 'RateBook': 1876,
'SearchScreeningEvent': 1852, 'BookRestaurant': 1881,
'GetWeather': 1896, 'SearchCreativeWork': 1847}

槽位情况（39）：
{'artist': 1804, 'album': 167, 'service': 738, 'entity_name': 561, 'playlist':
1963, 'object_select': 942,
'object_type': 3023, 'rating_value': 1877, 'best_rating': 1007, 'music_item':
1577, 'track': 202, 'playlist_owner': 1043,
'year': 611, 'sort': 518, 'movie_name': 765, 'party_size_number': 975, 'state':
953, 'city': 1304, 'timeRange': 1879,
'object_part_of_series_type': 298, 'movie_type': 666, 'spatial_relation': 1153,
'geographic_poi': 280, 'restaurant_type': 1299,
'party_size_description': 307, 'object_location_type': 450, 'object_name': 2789,
'rating_unit': 1081, 'location_name': 566,
'current_location': 259, 'served_dish': 258, 'country': 812,
'condition_temperature': 453, 'poi': 135, 'condition_description': 426,
'genre': 139, 'restaurant_name': 324, 'cuisine': 197, 'facility': 157}

dev:

意图情况（7）：
{'AddToPlaylist': 100, 'BookRestaurant': 100, 'GetWeather': 100, 'PlayMusic':
100, 'RateBook': 100,
'SearchCreativeWork': 100, 'SearchScreeningEvent': 100}

槽位情况（39）：
{'music_item': 86, 'playlist_owner': 54, 'playlist': 109, 'entity_name': 18,
'artist': 109, 'party_size_description': 13,
'restaurant_type': 62, 'spatial_relation': 68, 'state': 51, 'country': 44,
'party_size_number': 57, 'cuisine': 11, 'city': 71,
'poi': 6, 'served_dish': 5, 'timeRange': 110, 'restaurant_name': 20, 'sort': 26,
'facility': 7, 'current_location': 17,
'condition_description': 22, 'geographic_poi': 16, 'condition_temperature': 21,
'album': 13, 'service': 39, 'year': 25,
'track': 6, 'genre': 3, 'object_select': 49, 'object_type': 156, 'rating_value':
100, 'best_rating': 51, 'rating_unit': 61,
'object_name': 151, 'object_part_of_series_type': 15, 'movie_name': 49,
'object_location_type': 20, 'location_name': 29,
'movie_type': 24}

test:

意图情况（7）：
{'AddToPlaylist': 124, 'BookRestaurant': 92, 'GetWeather': 104, 'PlayMusic': 86,
 'SearchScreeningEvent': 107,
 'SearchCreativeWork': 107, 'RateBook': 80}

槽位情况（39）：
{'artist': 107, 'playlist': 129, 'party_size_number': 50, 'spatial_relation':
71, 'poi': 8, 'restaurant_type': 65,
 'playlist_owner': 70, 'condition_description': 28, 'state': 59, 'timeRange':
107, 'music_item': 104, 'sort': 32, 'movie_type': 33,
 'country': 44, 'current_location': 14, 'movie_name': 47, 'object_location_type':
22, 'location_name': 24, 'object_type': 162,
 'object_name': 147, 'served_dish': 12, 'object_select': 40, 'rating_value': 80,
 'best_rating': 43, 'rating_unit': 40, 'city': 60,
 'cuisine': 14, 'year': 24, 'entity_name': 33, 'service': 24, 'geographic_poi':
11, 'object_part_of_series_type': 11,
 'condition_temperature': 23, 'restaurant_name': 15, 'party_size_description':
10, 'genre': 5, 'track': 9, 'album': 10, 'facility': 3}

other

数据特点：长尾分布，意图和槽位混合分布

样本个数：train：2063, test：516, dev:516.

样本长度：最长27，最短2，平均9

槽位和意图情况：

意图(23类)：
[CLOSEPRICE_QUERY, CREATE, DEFAULT, DIAL, DOWNLOAD, FORWARD, LAUNCH, LOOK_BACK,
NUMBER_QUERY, NaN, OPEN, PLAY, POSITION,
QUERY, REPLAY_ALL, REPLY, RISERATE_QUERY, ROUTE, SEARCH, SEND, SENDCONTACTS,
TRANSLATION, VIEW]

槽位(62类):
{
'ROUTE': ['endLoc_area', 'endLoc_city', 'endLoc_poi', 'endLoc_province', 'startLoc_area',
'startLoc_city', 'startLoc_poi', 'type'],
'QUERY': ['Dest', 'Src', 'area', 'artist', 'artistRole', 'author', 'awayName', 'category', 'code', 'date',
'datetime_date',
    'datetime_time', 'decade', 'dishName', 'dishNamet', 'dynasty', 'endLoc_area', 'endLoc_city',
'endLoc_poi', 'endLoc_province',
    'episode', 'film', 'homeName', 'ingredient', 'keyword', 'location_city', 'name', 'payment',
'popularity', 'queryField',
    'questionWord', 'resolution', 'scoreDescr', 'season', 'startDate_date', 'startDate_dateOrig',
'startDate_time', 'startLoc_area',
    'startLoc_city', 'startLoc_poi', 'startLoc_province', 'subfocus', 'tag', 'theatre', 'timeDescr',
'tvchannel', 'type', 'utensil',
    'yesterday'],
'OPEN': ['name'],
'LAUNCH': ['code', 'location_province', 'name'],
'SEND': ['content', 'headNum', 'name', 'teleOperator'],
'REPLY': [],

'CREATE': ['code', 'name'],
'TRANSLATION': ['content', 'target'],
'PLAY': ['artist', 'category', 'code', 'datetime_date', 'datetime_time', 'keyword', 'location_city', 'location_country',
       'location_province', 'media', 'name', 'resolution', 'song'],
'SENDCONTACTS': ['category', 'name', 'receiver'],
'POSITION': ['location_area', 'location_city', 'location_poi', 'location_province'],
'DEFAULT': [],
'DIAL': ['category', 'name', 'teleOperator'],
'RISERATE_QUERY': ['code', 'name'],
'NUMBER_QUERY': ['absIssue', 'category', 'datetime_date', 'name', 'relIssue'],
'LOOK_BACK': ['datetime_date', 'datetime_time', 'name', 'tvchannel'],
'NaN': ['dishName', 'name'],
'FORWARD': [],
'SEARCH': ['artist', 'category', 'song'],
'CLOSEPRICE_QUERY': ['name', 'yesterday'],
'REPLAY_ALL': [],
'VIEW': [],
'DOWNLOAD': ['name'],
'DATE_QUERY': ['name']}

train:

意图情况（23）：
{'ROUTE': 57, 'QUERY': 1277, 'OPEN': 61, 'LAUNCH': 81, 'SEND': 85, 'REPLY': 4,
'CREATE': 11, 'TRANSLATION': 71,
'PLAY': 232, 'SENDCONTACTS': 20, 'POSITION': 32, 'DEFAULT': 11, 'DIAL': 62,
'RISERATE_QUERY': 8, 'NUMBER_QUERY': 22,
'LOOK_BACK': 5, 'NaN': 3, 'FORWARD': 3, 'SEARCH': 8, 'CLOSEPRICE_QUERY': 2,
'REPLAY_ALL': 6, 'VIEW': 1, 'DOWNLOAD': 1}

槽位情况（60）：
{'endLoc_poi': 43, 'Src': 33, 'Dest': 34, 'tag': 28, 'category': 193, 'name':
738, 'content': 98, 'dynasty': 25,
'target': 61, 'author': 49, 'startLoc_city': 130, 'endLoc_city': 167,
'dishName': 259, 'ingredient': 91, 'receiver': 20,
'location_poi': 21, 'resolution': 14, 'media': 2, 'tvchannel': 83,
'datetime_time': 40, 'song': 66, 'type': 8,
'startDate_dateOrig': 1, 'datetime_date': 89, 'code': 17, 'keyword': 100,
'startDate_date': 47, 'artist': 31,
'endLoc_area': 13, 'startLoc_area': 11, 'queryField': 16, 'location_city': 23,
'area': 6, 'teleOperator': 1,
'scoreDescr': 8, 'endLoc_province': 5, 'artistRole': 8, 'relIssue': 1,
'homeName': 1, 'awayName': 1, 'season': 2,
'timeDescr': 8, 'popularity': 8, 'dishNamet': 1, 'location_province': 5,
'yesterday': 3, 'theatre': 7, 'questionWord': 2,
'subfocus': 5, 'absIssue': 1, 'startDate_time': 4, 'episode': 4, 'utensil': 2,
'decade': 1, 'payment': 1, 'startLoc_poi': 8,
'date': 1, 'film': 2, 'headNum': 1, 'location_area': 1}

dev:

意图情况 (18):
{'QUERY': 318, 'POSITION': 8, 'LAUNCH': 21, 'NUMBER_QUERY': 7, 'PLAY': 52,
'TRANSLATION': 26, 'ROUTE': 17, 'OPEN': 14,
'SEND': 16, 'DIAL': 20, 'DEFAULT': 4, 'DOWNLOAD': 1, 'SENDCONTACTS': 3,
'FORWARD': 2, 'REPLY': 3, 'LOOK_BACK': 1,
'CREATE': 2, 'DATE_QUERY': 1}

槽位情况 (44):
{'category': 46, 'type': 3, 'dishName': 52, 'tvchannel': 15, 'name': 182,
'location_city': 4, 'location_poi': 6, 'relIssue': 2,
'startDate_date': 18, 'endLoc_city': 62, 'startLoc_city': 45, 'ingredient': 25,
'author': 22, 'content': 30, 'target': 17,
'endLoc_province': 1, 'endLoc_area': 5, 'endLoc_poi': 8, 'keyword': 30, 'Src':
4, 'Dest': 4, 'datetime_date': 21,
'location_area': 3, 'area': 4, 'dynasty': 8, 'tag': 6, 'teleOperator': 1,
'media': 1, 'popularity': 2, 'location_country': 1,
'receiver': 3, 'datetime_time': 13, 'song': 13, 'timeDescr': 2, 'episode': 1,
'artist': 4, 'queryField': 6, 'code': 3,
'location_province': 1, 'startLoc_province': 1, 'theatre': 2, 'startLoc_area':
1, 'resolution': 1, 'artistRole': 1}

test:

意图情况 (18):
{'QUERY': 318, 'POSITION': 8, 'LAUNCH': 21, 'NUMBER_QUERY': 7, 'PLAY': 52,
'TRANSLATION': 26, 'ROUTE': 17, 'OPEN': 14,
'SEND': 16, 'DIAL': 20, 'DEFAULT': 4, 'DOWNLOAD': 1, 'SENDCONTACTS': 3,
'FORWARD': 2, 'REPLY': 3, 'LOOK_BACK': 1,
'CREATE': 2, 'DATE_QUERY': 1}

槽位情况 (44):
{'category': 46, 'type': 3, 'dishName': 52, 'tvchannel': 15, 'name': 182,
'location_city': 4, 'location_poi': 6, 'relIssue': 2,
'startDate_date': 18, 'endLoc_city': 62, 'startLoc_city': 45, 'ingredient': 25,
'author': 22, 'content': 30, 'target': 17,
'endLoc_province': 1, 'endLoc_area': 5, 'endLoc_poi': 8, 'keyword': 30, 'Src':
4, 'Dest': 4, 'datetime_date': 21,
'location_area': 3, 'area': 4, 'dynasty': 8, 'tag': 6, 'teleOperator': 1,
'media': 1, 'popularity': 2, 'location_country': 1,
'receiver': 3, 'datetime_time': 13, 'song': 13, 'timeDescr': 2, 'episode': 1,
'artist': 4, 'queryField': 6, 'code': 3,
'location_province': 1, 'startLoc_province': 1, 'theatre': 2, 'startLoc_area':
1, 'resolution': 1, 'artistRole': 1}

model
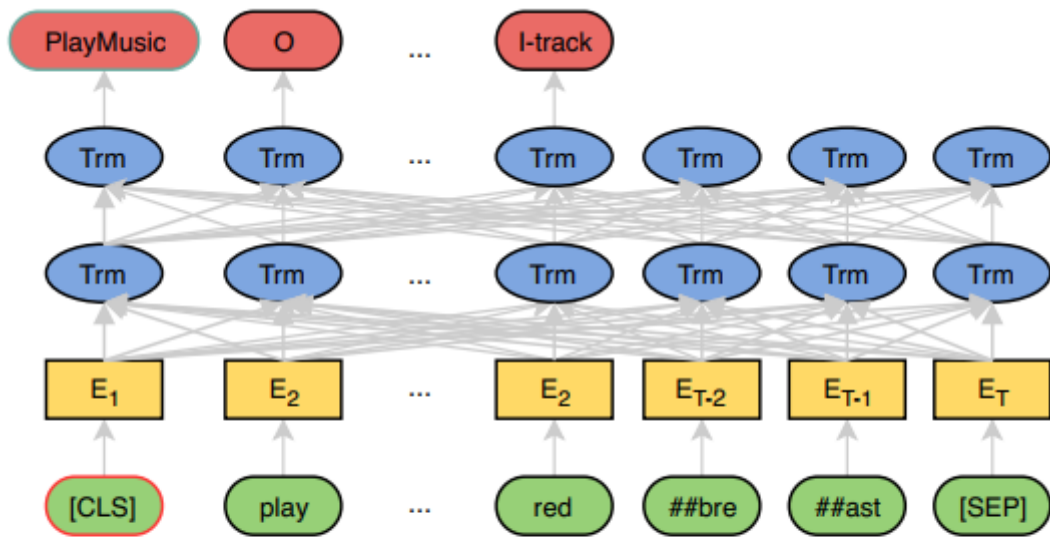
Joint Intent Classification and Slot Filling

Joint BERT

Figure 1: A high-level view of the proposed model. The input query is "play the song little robin redbreast".

result

atis

```
dev
05/08/2020 14:34:01 - INFO - trainer -      intent_acc = 0.976
05/08/2020 14:34:01 - INFO - trainer -      loss = 0.2054151811171323
05/08/2020 14:34:01 - INFO - trainer -      semantic_frame_acc = 0.9
05/08/2020 14:34:01 - INFO - trainer -      slot_f1 = 0.9736688121708601
05/08/2020 14:34:01 - INFO - trainer -      slot_precision = 0.972530683810637
05/08/2020 14:34:01 - INFO - trainer -      slot_recall = 0.9748096074985354

test
05/08/2020 14:34:06 - INFO - trainer -    ***** Eval results *****
05/08/2020 14:34:06 - INFO - trainer -      intent_acc = 0.973124300111982
05/08/2020 14:34:06 - INFO - trainer -      loss = 0.3136954630920497
05/08/2020 14:34:06 - INFO - trainer -      semantic_frame_acc =
0.864501679731243
05/08/2020 14:34:06 - INFO - trainer -      slot_f1 = 0.9518960674157303
05/08/2020 14:34:06 - INFO - trainer -      slot_precision = 0.9485654303708887
05/08/2020 14:34:06 - INFO - trainer -      slot_recall = 0.9552501761804087
```

snips

```
dev
05/08/2020 14:52:32 - INFO - trainer -      intent_acc = 0.98
05/08/2020 14:52:32 - INFO - trainer -      loss = 0.37033650439909915
05/08/2020 14:52:32 - INFO - trainer -      semantic_frame_acc = 0.88
05/08/2020 14:52:32 - INFO - trainer -      slot_f1 = 0.9489456159822421
05/08/2020 14:52:32 - INFO - trainer -      slot_precision = 0.9447513812154696
05/08/2020 14:52:32 - INFO - trainer -      slot_recall = 0.9531772575250836
```

```
test
05/08/2020 14:52:56 - INFO - trainer -    ***** Eval results *****
05/08/2020 14:52:56 - INFO - trainer -      intent_acc = 0.9857142857142858
05/08/2020 14:52:56 - INFO - trainer -      loss = 0.24339534765617413
05/08/2020 14:52:56 - INFO - trainer -      sementic_frame_acc =
0.8728571428571429
05/08/2020 14:52:56 - INFO - trainer -      slot_f1 = 0.9471635150166852
05/08/2020 14:52:56 - INFO - trainer -      slot_precision = 0.9429678848283499
05/08/2020 14:52:56 - INFO - trainer -      slot_recall = 0.9513966480446927
```

other

```
test
05/08/2020 17:31:26 - INFO - trainer -    ***** Eval results *****
05/08/2020 17:31:26 - INFO - trainer -      intent_acc = 0.9767441860465116
05/08/2020 17:31:26 - INFO - trainer -      loss = 0.41901199607288137
05/08/2020 17:31:26 - INFO - trainer -      sementic_frame_acc =
0.7984496124031008
05/08/2020 17:31:26 - INFO - trainer -      slot_f1 = 0.8389891696750903
05/08/2020 17:31:26 - INFO - trainer -      slot_precision = 0.8241134751773049
05/08/2020 17:31:26 - INFO - trainer -      slot_recall = 0.8544117647058823
```