

# SemEval 2016 Task 5

## Aspect Based Sentiment Analysis (ABSA-16)

### Annotation Guidelines

#### 1. Introduction

The goal of the ABSA-16 task is to identify opinions expressed within customer reviews towards specific entities and their attributes. This document describes the annotation guidelines that were used in ABSA-16 and which are based on the respective guidelines of SemEval-2015 ABSA task<sup>1</sup> (Pontiki et al., 2015).

In particular, given a review about a particular entity (a restaurant, a hotel, a laptop, a phone, or a camera), the task of the annotator is to identify the following types of information:

- **Aspect Category (Entity and Attribute).** Identify the entity E and attribute A pair E#A towards which an opinion is expressed. E and A should be chosen from the inventories of **entity types** (e.g. restaurant, food, drinks) and **attribute labels** (e.g. prices, quality) per domain that are described in the following sections. The identified entities should be assigned one or more attribute labels based on the context of the sentence they appear in. The E#A pair defines an aspect (category).
- **Opinion Polarity.** Each identified E#A pair of a sentence has to be assigned a polarity, from a set  $P = \{\text{positive, negative, neutral}\}$ . The *neutral* label applies for *mildly positive or negative sentiment*, thus it does not indicate objectivity (e.g. “Food was okay, nothing great”).
- **Opinion Target Expression.** An opinion target expression (OTE) is an *explicit reference (mention)* to the reviewed entity **E** of the E#A pair. This reference can be a named entity, a common noun or a multi-word term, and is uniquely identified by its starting and ending offsets<sup>2</sup>. Below are some examples:
  - a. *Leon is an East Village gem.* → {RESTAURANT#GENERAL, “Leon”, positive}
  - b. *The lobster sandwich is good and the spaghetti with Scallops and Shrimp is great.* → {FOOD#QUALITY, “lobster sandwich”, positive}, {FOOD#QUALITY, “spaghetti with Scallops and Shrimp”, positive}

When a sentence contains more than one mention (e.g. nominal and pronominal) to the same entity then the *most informative* one should be annotated e.g. “It’s a nice place to relax and have conversation”. → {AMBIENCE#GENERAL, “place”, positive}

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<sup>1</sup> <http://alt.qcri.org/semeval2015/task12/index.php?id=data-and-tools>

<sup>2</sup> In the provided examples the starting and ending offsets of the OTEs are omitted for simplicity. Instead we only give the OTE mention (e.g. “Leon”).

If an OTE has more than one occurrences in the same sentence, only the first one should be tagged e.g. “*Guacamole+shrimp appetizer was really great, we both had the filet, very good, didn't much like the frites that came with, but the filet was so good, neither of us cared.*” → {FOOD#QUALITY, “*Guacamole+shrimp appetizer*”, *positive*}, {FOOD#QUALITY, “*filet*”, *positive*}, {FOOD#QUALITY, “*frites*”, *negative*}

When an entity E is only implicitly referred (e.g. through pronouns) or inferred in a sentence, then the OTE slot is assigned the value “NULL” e.g. “*Everything was wonderful*” → {RESTAURANT#GENERAL, “NULL”, *positive*}

The {E#A, P} annotations should be assigned at the sentence level taking into account the context of the whole review. For example, sentence a<sub>2</sub> should be assigned a negative opinion about the customer support and not about the operation of the laptop, as it is implied by a<sub>1</sub>. Similarly, in b<sub>1</sub>, even though the reviewer starts by saying how happy he/she was with the laptop, he/she is expressing a negative opinion towards the laptop as it can be inferred from b<sub>2</sub>.

- A) a<sub>1</sub>. *Horrible customer support-they lost my laptop for a month-got it back 3 months later.*  
a<sub>2</sub>. *Laptop still did not work, blue screen within a week...*
- B) b<sub>1</sub>. *I was so happy with my new Mac.*  
b<sub>2</sub>. *For two months...*

Opinions expressed towards entities that can't be described by using our annotation schema (e.g. other restaurants that the reviewer has visited, comparative opinions) are considered to be **out of the scope**, and the corresponding sentences should be tagged accordingly. Below are some examples:

- a. *I was in love with Pongsri on 48th, but compared to Suan it is slow in service and overpriced.* → {OutOfScope}  
b. *It's also attached to Angel's Share, which is a cool, more romantic bar...* → {OutOfScope}  
c. *The one on the east side is much better than the one on the west side.* → {OutOfScope}  
d. *I've stayed in 3 star hotels that were worse.* → {OutOfScope}

In the context of SemEval 2016, the ABSA task is supported for the following domains: **Restaurants**, **Hotels**, **Consumer Electronics** (laptops, mobile phones and digital cameras), and **Telecommunications**.

## 2. Restaurant Reviews

The annotation schema is the same with the one provided in the SemEval-2015 ABSA task (Task 12) for annotating restaurant reviews (Pontiki et al., 2015).

## 2.1. Entity Labels

An entity (that is evaluated) can be the restaurant as a whole (e.g. restaurant, Saul, Red Eye Grill), its ambience and location, the food and drinks that are offered, etc. In particular, the entity E of an {E#A} pair can be assigned one of the following 6 labels. For each identified entity type, the annotators should also tag the respective entity mention (OTE) or assign the value NULL when there is no explicit mention of the evaluated entity.

- **FOOD** for opinions focusing on the food in general or in terms of specific dishes, dining options etc. e.g. *“The lobster sandwich is good and the spaghetti with Scallops and Shrimp is great.”* → {**FOOD**, *“lobster sandwich”*}, {**FOOD**, *“spaghetti with Scallops and Shrimp”*}
- **DRINKS** for opinions focusing on the drinks in general or in terms of specific drinks, drinking options etc. e.g. *“Drinks way overpriced.”* → {**DRINKS**, *“drinks”*}
- **SERVICE** for opinions focusing on the (customer/kitchen/counter) service, on the promptness and quality of the restaurant’s service in general, the food preparation, the staff’s attitude and professionalism, the wait time, the options offered (e.g. takeout), etc. e.g. *“They never brought us complimentary noodles, ignored repeated requests for sugar, and threw our dishes on the table.”* → {**SERVICE**, *“NULL”*}
- **AMBIENCE** for opinions focusing on the atmosphere or the environment of the restaurant’s interior or exterior space (e.g. terrace, yard, garden), the décor, entertainment options, etc. e.g. *“It’s a nice place to relax and have conversation.”* → {**AMBIENCE**, *“place”*}
- **LOCATION** for opinions focusing on the location of the reviewed restaurant in terms of its position, the surroundings, the view, etc. e.g. *“The view is spectacular, and the food is great.”* → {**LOCATION**, *“view”*}, {**FOOD**, *“food”*}
- **RESTAURANT** for opinions expressed about the (specific) evaluated restaurant as whole not focusing on any of the above five entity types. e.g. *“Leon is an East Village gem.”* → {**RESTAURANT**, *“Leon”*}

## 2.2. Attribute Labels

The attribute A of an {E#A} pair can be assigned one of the following 5 labels. In the examples below the respective polarity label is also provided.

- **GENERAL**. This attribute label is assigned to sentences that express general positive or negative sentiment about an entity type. e.g. *“I received prompt service with a smile.”* → {**SERVICE#GENERAL**, *“service”*, *positive*}
- **PRICES** for opinions that refer to the prices of the food, the drinks or the restaurant in general. e.g. *“Prices are in line.”* → {**RESTAURANT#PRICES**, *“NULL”*, *positive*}

- **QUALITY** for opinions focusing on the taste, the freshness, the texture, the consistency, the temperature, the preparation, the authenticity, the cooking or general quality of the food and the drinks served in the restaurant. e.g. “*The food was bland oily.*” → {FOOD#QUALITY, “*food*”, *negative*}
- **STYLE&OPTIONS** for opinions referring to the presentation, the serving style, the portions size, the food/menu options or variety (e.g. innovative dishes/drinks, vegetarian options) of the food and of the drinks served in the restaurant. e.g. “*The portions are small but being that the food was so good makes up for that.*” → {FOOD#QUALITY, “*food*”, *positive*}, {FOOD#STYLE&OPTIONS, “*portions*”, *negative*}
- **MISCELLANEOUS** for attributes that do not fall into any of the aforementioned cases. e.g. “*Not a great place for family or general dining.*” → {RESTAURANT#MISCELLANEOUS, “*place*”, *negative*}

### 2.3. E#A combinations and more examples

Note that the entities types **SERVICE**, **AMBIENCE** and **LOCATION**, can only be assigned the attribute label **GENERAL** for the purposes of the SemEval 2016 annotation task. Opinions about the **FOOD** and **DRINKS** in general are considered to be about its **QUALITY**. The possible E#A pairs are provided in the table below:

	GENERAL	PRICES	QUALITY	STYLE&OPTIONS	MISCELLANEOUS
RESTAURANT	✓	✓	x	x	✓
FOOD	x	✓	✓	✓	x
DRINKS	x	✓	✓	✓	x
AMBIENCE	✓	x	x	x	x
SERVICE	✓	x	x	x	x
LOCATION	✓	x	x	x	x

In the context of the SemEval 2016 ABSA Task, the restaurants domain is supported for the following languages: English (**En**), Dutch (**Du**), French (**Fr**), Russian (**Ru**), Spanish (**Sp**), and Turkish (**Tu**). Below are some examples:

#### **RESTAURANT#GENERAL**

**En:** *Leon is an East Village gem.* → {“*Leon*”, *positive*}

**Du:** *Maar eens in het kasteelrestaurant aangekomen werd het een feest.* → {“*kasteelrestaurant*”, *positive*}

**Fr:** *Une adresse à éviter!* → {“*adresse*”, *negative*}

**Ru:** *Первый раз пишу отзыв о ресторане, настолько меня впечатлило данное место.* → {“*место*”, *positive*}

**Sp:** *Tengo cariño fundado por este restaurante.* → {"**restaurante**", positive}

**Tu:** *Burayi seviyorum gerçekten.* → {"**Burayi**", positive}

#### **RESTAURANT#PRICES**

**En:** *The prices are wonderfully low.* → {"NULL", positive}

**Du:** *Niet goedkoop maar zeker zijn geld waard.* → {"NULL", positive}

**Fr:** *Les prix restent corrects également.* → {"NULL", neutral}

**Ru:** Единственное, что расстраивает - это рост цен. → {"NULL", negative}

**Sp:** *¡A estos precios me parece un insulto!* → {"NULL", negative}

**Tu:** *İsim yapmıştır çünkü pahalı olduğu için kaliteli algısı yaratır.* → {"NULL", negative}

#### **RESTAURANT#MISCELLANEOUS**

**En:** *Not a great place for family or general dining.* → {"**place**", negative}

**Du:** *het enige nadeel is dat er geen rolstoelpatienten binnenkunnen aangezien het op het eerste verdiep ligt!.* → {"NULL", negative}

**Fr:** *Toujours très rempli le midi, je n'ai eu l'occasion d'y aller que le soir.* → {"NULL", neutral}

**Ru:** Нет зоны для некурящих((( → {"NULL", negative}

**Sp:** *Buen restaurante para ir en grupo con los amigos o compañeros de trabajo !* → {"**restaurante**", positive}

**Tu:** *Kuaförü de çok ucuz ve iyi ayrıca.* → {"**Kuaförü**", positive}

#### **FOOD#QUALITY**

**En:** *Salads are a delicious way to begin the meal.* → {"**Salads**", positive}

**Du:** *Nergens in Hasselt zijn de pannenkoeken zo lekker als hier!!!* → {"**pannekoeken**", positive}

**Fr:** *Ces pauvres poulpes auraient pu mourir d'un excès de cholestérol s'ils n'avaient pas fini sur la plancha.* → {"**poulpes**", negative}

**Ru:** Все блюда очень вкусные, приготовлены по-домашнему. → {"**блюда**", positive}

**Sp:** *Para niños croquetas buenísimas y hamburguesas de buena calidad.* → {"**croquetas**", positive}, {"**hamburguesas**", positive}

**Tu:** *Hamburgerini pek beğenmedim ama diğer yemekleri lezzetli olabilir belki.* → {"**yemekleri**", positive}, {"**Hamburgerini**", negative}

#### **FOOD#STYLE OPTIONS**

**En:** *The menu is very limited - I think we counted 4 or 5 entrees.* → {"**menu**", negative}

**Du:** *Je hebt de keuze tussen een beperkt aantal menus.* → {"**menus**", negative}

**Fr:** *Les assiettes sont copieuses.* → {"**assiettes**", positive}

**Ru:** Я лично ожидал чуть больше блюд из мяса в таком ресторане на мангале. → {"**блюд из мяса**", negative}

**Sp:** *Alcachofas brasa solo una mitad por persona.* → {"**Alcachofas brasa**", negative}

**Tu:** *Bu arada porsiyon da oldukça büyük, iki kişiye rahatlıkla yeter.* → {"**porsiyon**", positive}

#### **FOOD#PRICES**

**En:** *But the pizza is way too expensive.* → {"**pizza**", negative}

**Du:** *Maar dit was zijn geld niet waardig.* → {"NULL", negative}

**Fr:** *Total 22€ le poisson, scandaleux !* → {"**poisson**", negative}

**Ru:** По ценам с купонами получилось вполне приемлемо. → {"NULL", neutral}  
**Sp:** *nos sorprendio los precios tan altos, 3,5€ una croqueta.* → {"croqueta", negative}  
**Tu:** *3 gidip 2 kisilik getirin dersiniz yiyecekler bu sekilde geliyor ama kisi basina 70tl yaziyorlar cok sacma olmus.* → {"yiyecekler", negative}

#### **+** DRINKS#QUALITY

**En:** *Wonderful strawberry daiquiris as well!* → {"strawberry daiquiris", positive}  
**Du:** *Wijn was niet te drinken.* → {"Wijn", negative}  
**Fr:** *Le cidre est bon...* → {"cidre", positive}  
**Ru:** Мы сели, заказали грузинские блюда, шампанское, через минут 5 нам принесли самое вкусное шампанское, которое я пила в жизни. → {"шампанское", positive}  
**Sp:** *La sangria de cava muy buena.* → {"sangria de cava", positive}  
**Tu:** *Burada caylar harika!* → {"caylar", positive}

#### **+** DRINKS#STYLE\_OPTIONS

**En:** *The sake menu should not be overlooked!* → {"sake menu", positive}  
**Du:** *Het aan bod van bieren en andere is zeer beperkt.* → {"bieren", negative}  
**Fr:** *Carte des vins inexistante.* → {"carte des vins", negative}  
**Ru:** Так же большой выбор коктейлей, некоторые очень неплохие. → {"коктейлей", positive}  
**Sp:** *Debe mejorar muy mucho su carta de vinos.* → {"carta de vinos", negative}  
**Tu:** *60'a yakin çeşitte çaydan birini mutlaka seviceksiniz.* → {"çaydan", positive}

#### **+** DRINKS#PRICES

**En:** *Drinks way overpriced.* → {"Drinks", negative}  
**Du:** *Biertje bij het eten waar ze 8 euro voor vroegen.* → {"Biertje", negative}  
**Fr:** *Les vins y sont très chers.* → {"vins", negative}  
**Ru:** Цены на вино просто бешенные..хотя, может для такого ресторана это и нормально, но вот в соотношении с едой мне показалось дорого! → {"вино", negative}  
**Sp:** *Obviamente, por los 2,50 euros cobrados por el agua del grifo, han perdido a dos clients.* → {"agua del grifo", negative}  
**Tu:** *Bira dışında başka bir şey içmenizi istemeyen mekan, bira 7,8 lira iken votka 25, şarap 17.5...* → {"votka", negative}, {"şarap", negative}

#### **+** SERVICE#GENERAL

**En:** *Service was slow, but the people were friendly.* → {"Service", negative}, {"people", positive}  
**Du:** *Snelle bediening en vriendelijke personeel moet ook gemeld worden!!* → {"bediening", positive}, {"personeel", positive}  
**Fr:** *Le service est impeccable, personnel agréable.* → {"service", positive}, {"personnel", positive}  
**Ru:** Про сервис ничего негативного не скажешь- быстро подходят, все улабаются, подходят спрашивают, всё ли нравится. → {"сервис", neutral}  
**Sp:** *También la rapidez en el servicio.* → {"servicio", positive}  
**Tu:** *Servisi hızlı valesi var.* → {"Servisi", positive}

#### **+** AMBIENCE#GENERAL

**En:** *LOVE the atmosphere - felt like I was in Paris.* → {"atmosphere", positive}

**Du:** *Bovendien houden wij van de gezellige familiale sfeer.* → {"**sfeer**", *positive*}

**Fr:** *La salle est très agréable et tranquille.* → {"**salle**", *positive*}

**Ru:** Все детали продуманы до мелочей и вместе создают замечательную атмосферу тепла и комфорта. → {"**атмосфере**", *positive*}

**Sp:** *Y el lugar está muy bien decorado, sencillo, pero elegante.* → {"**lugar**", *positive*}

**Tu:** *Dekorasyonu renkleri çok sıcak ve sevimli.* → {"**Dekorasyonu**", *positive*}, {"**renkleri**", *positive*}

#### 🚩 LOCATION#GENERAL

**En:** *The view is spectacular.* → {"**view**", *positive*}

**Du:** *Een plus voor de ligging, want je bent even buiten de drukte van de kust in het gezellige centrum van De Haan.* → {"**ligging**", *positive*}

**Fr:** *La vue est sublime.* → {"**vue**", *positive*}

**Ru:** Очень хорошее расположение в центре города, с красивыми видами из окна! → {"**видами из окна**", *positive*}

**Sp:** *También valoro su localización, para los que no tenemos coche se llega muy fácilmente ya que es muy céntrico.* → {"**localización**", *positive*}

**Tu:** *En iyi konumlu ögretmenevi!* → {"**konumlu**", *positive*}

### 3. Hotel Reviews

The annotation schema is the same with the one provided in the SemEval-2015 ABSA task (Task 12) for annotating hotel reviews (Pontiki et al., 2015).

#### 3.1. Entity Labels

An entity (that is evaluated) can be the hotel as a whole (e.g. hotel, Hilton), its rooms, facilities, location, etc. In particular, the entity E of an {E#A} pair can be assigned one of the following 7 labels. For each identified entity type, the annotators should also tag the respective entity mention (OTE) or assign the value NULL when there is no explicit mention of the evaluated entity.

- **HOTEL** for opinions evaluating the hotel as whole or in terms of the lack or presence of extra features/facilities. e.g. *"It's not a recipe for another stay."* → {**HOTEL**, "NULL"}
- **ROOMS** for opinions evaluating the rooms in terms of their size, general condition, view, furniture, bathroom, sleep quality and the lack or presence of extra features/amenities. e.g. *"The bathroom was small and all white, and lacked a soap dish in the shower and no grab bars with a rather tricky exit required out of the shower/tub."* → {**ROOMS**, "**bathroom**"}
- **ROOM\_AMENITIES** for opinions evaluating the rooms in terms of the amenities they include (e.g. air condition, refrigerator, microwave, mini bar, hair dryer, TV, toiletries, safe, balcony, coffee maker, linen). e.g. *"The air conditioning seemed to run constantly but never bring the temp below 75 in the room."* → {**ROOM\_AMENITIES**, "**air conditioning**"}

- **FACILITIES** for opinions focusing on the hotel facilities in terms of specific installations/areas (e.g. swimming pool, spa&sauna, beauty salon, restaurants, café, night club, casino, business center, gymnasium, access facility for the differently-abled, parking, etc.) or guest services offered by a hotel (e.g. shuttle, laundry, baby sitting or wake up services, sports activities, 24-hour concierge & front desk, information desk, in-room dining, internet access, availability of touristic material etc.). e.g. “*The conference/banquet room was great.*” → {**FACILITIES**, “*conference/banquet room*”}
- **SERVICE** for opinions focusing on the staff’s attitude and promptness, easiness to problem solving, execution of service in time, or the rooms/ check-in/ check-out/ reception etc. service, etc. e.g. “*Front desk staff were very friendly and helpful; made us feel very welcome to their property.*” → {**SERVICE**, “*Front desk staff*”}
- **LOCATION** for opinions focusing on the location of the reviewed hotel in terms of its position, the surroundings, the view, etc. e.g. “*Close to the airport and restaurants.*” → {**LOCATION**, “**NULL**”}
- **FOOD&DRINKS** for opinions focusing on the breakfast, the food and the drinks in general or in terms of specific dishes and drinks, dining/drinking options etc. e.g. “*The breakfast was average despite being called a hot buffet.*” → {**FOOD\_DRINKS**, “*breakfast*”}

### 3.2. Attribute Labels

The attribute A of an {E#A} pair can be assigned one of the following 8 labels. In the examples below the respective polarity label is also provided.

- **GENERAL**. This attribute label is assigned to sentences that express general positive or negative sentiment about an entity type (hotel, room amenities, rooms, facilities, location, service) e.g. “*Not bad for one night.*” → {**HOTEL#GENERAL**, “**NULL**”, *neutral*}
- **PRICES** for opinions that refer to the prices of the rooms, the food & drinks, the facilities/services offered by the hotel or the hotel in general e.g. “*Pleasantly surprised at \$69 night.*” → {**HOTEL#PRICES**, “**NULL**”, *positive*}
- **DESIGN&FEATURES** for opinions that refer to the design, the appearance/decor, the size of an entity (hotel, rooms, facilities), to extra or missing features (e.g. amenities/facilities), etc. e.g. “*The bathroom was small and all white, and lacked a soap dish in the shower and no grab bars with a rather tricky exit required out of the shower/tub.*” → {**ROOMS#DESIGN\_FEATURES**, “*bathroom*”, *negative*}, {**ROOMS#DESIGN\_FEATURES**, “*shower/tub*”, *negative*}
- **CLEANLINESS** for opinions that refer to the neatness or hygiene of the rooms, common areas and the hotel in general e.g. “*The room was spacious and clean.*” → {**ROOMS#DESIGN\_FEATURES**, “*room*”, *positive*}, {**ROOMS#CLEANLINESS**, “*room*”, *positive*}



- **COMFORT** for opinions evaluating an entity in terms of its comfortableness or convenience for the guests, (e.g. stay and sleep quality, accessibility). e.g. “*The building appears to be on permanent lock-down, as the only way in is through the front door, away from the main parking area.*” → {HOTEL#COMFORT, “**building**”, *negative*}
- **QUALITY** for opinions focusing on the quality of the food&drinks (e.g. taste, the freshness, the texture, the consistency, the temperature, the preparation, the authenticity, the cooking or general quality of the food and the drinks served in the hotel) or the quality of the hotel facilities and room amenities e.g.
  - a. *The towels were thin and worn.* → {ROOM\_AMENITIES#QUALITY, “**towels**”, *negative*}
  - b. *The breakfast is excellent!* → {FOOD\_DRINKS#QUALITY, “**breakfast**”, *positive*}
  - c. *An elevator was broken during our last stay and it was most annoying, but did not greatly impact the overall experience.* → {FACILITIES#QUALITY, “**elevator**”, *negative*}, {HOTEL#GENERAL, “**NULL**”, *positive*}
  - d. *Rooms are large but very plain, with furnishings and fixtures as cheap as possible.* → {ROOMS#DESIGN\_FEATURES, “**rooms**”, *positive*}, {ROOMS#DESIGN\_FEATURES, “**rooms**”, *negative*}, {ROOMS#QUALITY, “**furnishings**”, *negative*}, {ROOMS#QUALITY, “**fixtures**”, *negative*}
- **STYLE&OPTIONS** for opinions referring to the food/drinks presentation, the serving style, the portions size, the food/menu options or variety (e.g. innovative dishes/drinks, vegetarian options) of the food and of the drinks served in the restaurant e.g. “*It think it was a bit overpriced (my corporate rate was ~\$150/night) and for that I would expect a better variety of foods at breakfast, better towels and working ac.*” → {HOTEL#PRICES, “**NULL**”, *negative*}, {FOOD\_DRINKS#STYLE\_OPTIONS, “**breakfast**”, *negative*}, {ROOM\_AMENITIES#GENERAL “**towels**”, *negative*}, {ROOM\_AMENITIES#QUALITY, “**ac**”, *negative*}
- **MISCELLANEOUS** for attributes that do not fall into any of the aforementioned cases (e.g. recommendations for specific purposes). e.g. “*If you plan to do any hiking, this is a perfect place to stay.*” → {HOTEL#MISCELLANEOUS, “**place**”, *positive*}

### 3.3. E#A combinations and more examples

Note that the entities types **SERVICE**, and **LOCATION**, can only be assigned the attribute label **GENERAL** for the purposes of the SemEval 2016 annotation task. The possible E#A pairs are provided in the table below:

	GENERAL	PRICES	DESIGN & FEATURES	CLEANLINESS	COMFORT	QUALITY	STYLE & OPTIONS	MISCELLANEOUS
HOTEL	✓	✓	✓	✓	✓	✓	X	✓
ROOMS	✓	✓	✓	✓	✓	✓	X	✓
ROOM_ AMENITIES	✓	✓	✓	✓	✓	✓	X	✓
FACILITIES	✓	✓	✓	✓	✓	✓	X	✓
SERVICE	✓	X	X	X	X	X	X	X
LOCATION	✓	X	X	X	X	X	X	X
FOOD & DRINKS	X	✓	X	X	X	✓	✓	✓

In the context of the SemEval 2016 ABSA Task, the hotels domain is supported for the Arabic (Ar) language. Two examples of annotated reviews in Arabic are the following:

```

<Review rid="1210">
  <sentences>
    <sentence id="1210:0">
      <text>إقامة ممتازة</text>
      <Opinions>
        <Opinion target="إقامة" category="HOTEL#GENERAL" polarity="positive" from="0" to="5"/>
      </Opinions>
    </sentence>
    <sentence id="1210:1">
      <text>الخدمة جيدة الاكل متوسط مع توافق اماكن خاصة و مفاتيح</text>
      <Opinions>
        <Opinion target="الخدمة" category="SERVICE#GENERAL" polarity="positive" from="0" to="6"/>
        <Opinion target="الاكل" category="FOOD_DRINKS#STYLE_OPTIONS" polarity="positive" from="14" to="19"/>
      </Opinions>
    </sentence>
    <sentence id="1210:2">
      <text>شاطئ البحر خرافي مع بحيرة صناعية وامكانات جولة ومجال ترفيه</text>
      <Opinions>
        <Opinion target="شاطئ البحر" category="FACILITIES#DESIGN_FEATURES" polarity="positive" from="0" to="10"/>
      </Opinions>
    </sentence>
    <sentence id="1210:3">
      <text>بارانديستا جميل في قلب البحر ملاعب اطفال رائعة وركوب الجمال الموزونين غالبا ودودين وبيتسين</text>
      <Opinions>
        <Opinion target="باران" category="FACILITIES#GENERAL" polarity="positive" from="0" to="3"/>
        <Opinion target="ملاعب" category="FACILITIES#GENERAL" polarity="positive" from="32" to="37"/>
        <Opinion target="الموزونين" category="SERVICE#GENERAL" polarity="positive" from="63" to="71"/>
      </Opinions>
    </sentence>
    <sentence id="1210:4">
      <text>الغرفي متوسطة ولكن مريحة الحدائقه متوسط و التوشير عجينه التيمه مقابل ما تحصل عليه من متعه</text>
      <Opinions>
        <Opinion target="الغرفي" category="ROOMS#COMFORT" polarity="positive" from="0" to="5"/>
      </Opinions>
    </sentence>
  </sentences>
</Review>

```

```

<Review rid="1705">
  <sentences>
    <sentence id="1705:0">
      <text>وكان الجميع جميلة ومتعاونة في وخاصة ليوك</text>
      <Opinions>
        <Opinion target="NULL" category="SERVICE#GENERAL" polarity="positive" from="0" to="0"/>
      </Opinions>
    </sentence>
    <sentence id="1705:1">
      <text>الغرفة رائعة، الكثير من مساحة كبيرة بحجم ملكي، لتتحرك اختر من مقاعد مريحة ليجلس.</text>
      <Opinions>
        <Opinion target="الغرفة" category="ROOMS#DESIGN_FEATURES" polarity="positive" from="0" to="5"/>
      </Opinions>
    </sentence>
    <sentence id="1705:2">
      <text>لقد تم تصوير فيلم قصير منار كانت الغرفة في الطابق الأرضي خلف مكتب الاستقبال.</text>
      <Opinions>
        <Opinion target="الغرفة" category="ROOMS#DESIGN_FEATURES" polarity="positive" from="33" to="39"/>
        <Opinion target="البناء" category="FACILITIES#GENERAL" polarity="positive" from="85" to="91"/>
      </Opinions>
    </sentence>
    <sentence id="1705:3">
      <text>موقع رائع من المطاعم والمتاجر، ساعدتني مرة أخرى أوصي به لأي شخص.</text>
      <Opinions>
        <Opinion target="موقع" category="LOCATION#GENERAL" polarity="positive" from="0" to="4"/>
        <Opinion target="NULL" category="HOTEL#GENERAL" polarity="positive" from="0" to="0"/>
      </Opinions>
    </sentence>
  </sentences>
</Review>

```

## 4. Consumer Electronics Reviews

### 4.1. Laptops

The annotation schema is the same with the one provided in the SemEval-2015 ABSA task (Task 12) for annotating laptop reviews (Pontiki et al., 2015). In the context of the SemEval 2016 ABSA Task, the laptops domain is supported for the English language.

#### 4.1.1. Entity Labels

An entity (that is evaluated) can be the whole laptop (e.g. MacBook, Satellite), the *tangible* (e.g. keyboard, battery, screen) and *abstract parts* (e.g. Win7 OS, browsers, games) of it, or the manufacturing company (e.g. Apple, Dell) and the services it provides (e.g. pre- and after-sales customer support). In particular, the entity E of an E#A pair can be assigned 22 possible labels which are described below. For this domain, annotators do not have to tag OTEs.

- **LAPTOP:** This label is assigned when the reviewed entity is a specific laptop as a whole. For example, in the following sentences a laptop is being evaluated with regard to particular attributes such as the speed (*a*) and the weight (*b*):
  - a. *The computer was really good and it goes really fast just the way I thought it would of run.* → {LAPTOP}
  - b. *My HP is very heavy.* → {LAPTOP}
- 14 labels that refer to single hardware components, parts or a set of components:
  - a) **DISPLAY** (=monitor, screen) e.g. *Also the screen is exceptional and the images are very clear!* → {DISPLAY}
  - b) **CPU** (=processor) e.g. *This is a nicely sized laptop with lots of processing power.* → {LAPTOP, CPU}
  - c) **MOTHERBOARD** e.g. *The processor went on me and the motherboard went.* → {CPU, MOTHERBOARD}
  - d) **HARD DISC** e.g. *Nice laptop and plenty of storage with 250 gb.* → {LAPTOP, HARD\_DISC}
  - e) **MEMORY** e.g. *It has plenty of memory and lots of hard drive.* → {MEMORY, HARD\_DISC}
  - f) **BATTERY** e.g. *After replacing the hard drive the battery stopped working (3 months of use) which was frustrating.* → {BATTERY}
  - g) **POWER\_SUPPLY** (charger, charger unit, power supply cord, (power) adapter) e.g. *My power supply cord developed exposed wires within the first year of ownership.* → {POWER\_SUPPLY}
  - h) **KEYBOARD** (keys, numpad) e.g. *It's so nice to look at and the keys are easy to type with.* → {LAPTOP, KEYBOARD} (Previous sentence: “*This laptop is insane!*”)
  - i) **MOUSE** (mouse pad and the buttons on it) e.g. *It had the full sized touch pad with 2 buttons instead of just one.* → {MOUSE}
  - j) **FANS\_COOLING** (fan, cooling system, heat sink) e.g. *Fan vents to the side, so no cooling pad needed, great feature!* → {FANS\_COOLING}
  - k) **OPTICAL\_DRIVES** (CD, DVD or Blue-ray players, DVD drive, disc drive, DVD burner) e.g. *I actually had the dvd drive replaced twice.* → {OPTICAL\_DRIVES}
  - l) **PORTS** (USB, HDMI, VGA, card reader, Firewire, SD, DVI, Thunderbolt) e.g. *The plastic piece that covers the usb port wires have all come off.* → {PORTS}
  - m) **GRAPHICS** (graphics card, video card, graphics chip) e.g. *Only good thing is the graphics quality.* → {GRAPHICS}
  - n) **MULTIMEDIA\_DEVICES** (sound, audio, microphone, (built-in) camera, webcam, speakers, headphone) e.g. *The features are great, the only thing it needs is better speakers.* → {LAPTOP, MULTIMEDIA\_DEVICES}

Notice that in *d* the reviewer expresses an opinion about the laptop as whole not focusing on any specific attribute (*nice laptop*), but also an opinion about the storage capacity of the hard disc (without explicitly mentioning the term “*hard disc*” or “*hard drive*” as in *e*); hence, two entities are being evaluated (**LAPTOP**, and **HARD\_DISC**). Notice that in *h* the pronoun “*It*” refers to the laptop as whole (as it is indicated by the previous sentence of the review); hence, the reviewer expresses an opinion focusing on the ease of use of the keys (**KEYBOARD**), but also an opinion focusing on the appearance of the laptop as a whole (**LAPTOP**).

- A general entity label **HARDWARE** is used for sentences that refer to the hardware in general or to hardware related entities that do not fall into one of the existing entity types e.g. *This is likely due to poor grounding and isolation between the components, and I'm hoping that it can be fixed.* → {**HARDWARE**}
- **OS**: This label applies to sentences discussing the operating system and its features (i.e. *start menu, safe mode, boot manager, drag and drop feature*). e.g. *The Mac Os X is a clean and smooth operating system.* → {**OS**}
- **SOFTWARE**: This label applies for the rest of the software applications (e.g. Office Suite, Office, iWork, Mac version of Microsoft Office, word processor, Microsoft Word, PowerPoint, browsers, Skype, iPhoto, iLife, photo detection software, Pages, Keynotes, antivirus programs, firewall, games), as well as for sentences/reviews that refer to the software in general e.g. *Its software and speed enable it to do amazing things.* → {**SOFTWARE, LAPTOP**}

Furthermore, we have the following 4 entity types that refer to the manufacturing company as a brand and to the services/products it provides:

- **WARRANTY** that is provided by the manufacturer e.g. *The manufacturer's warranty only covers replacement/repair of parts.* → {**WARRANTY**}
- **SHIPPING** for the delivery service when the laptop is bought or during repairs e.g. *The computer was two weeks late in delivery because HP forgot to complete the required import paperwork.* → {**SHIPPING**}
- **SUPPORT** for pre- and after-sales customer support, customer service, repair service, product support, replacement policy and the staff e.g. *They really do have the worlds very worst repair service.* → {**SUPPORT**}
- **COMPANY** for sentences that refer in general to the manufacturing company (brand name) e.g. *I will only buy apple laptops from now on.* → {**COMPANY**}

#### 4.1.2. Attribute Labels

The attribute A of an E#A pair can be assigned 9 possible labels which are described below. In the examples below the respective polarity label is also provided.

- **GENERAL**. This attribute label is used for general opinions expressed about an entity as a whole (e.g. laptop, hardware, software, company) not focusing on any specific attribute etc. e.g. *Keyboard is nice.* → {**KEYBOARD#GENERAL, positive**}
- **PRICE** for opinions focusing on the price (cheap or expensive) of the laptop and the services provided by the manufacturer (support, shipping and warranty) e.g. *Luckily, for all of us contemplating the decision, the Mac Mini is priced just right.* → {**LAPTOP#PRICE, positive**}
- **QUALITY** for opinions referring to the following attributes of an entity: construction/build quality, materials quality, enduring/long-lasting quality (=durability, longevity), broken components, noise, overheating problems, general feel, security (virus-resistant), screen quality (picture quality, screen colors, resolution and clearness), quality of service/shipping. Here are some examples:  
*a. Screen is crystal clear.* → {**DISPLAY#QUALITY, negative**}

- b. *The technical service for Dell is so 3rd world it might as well not even bother.* → {SUPPORT#QUALITY, negative}
  - c. *The computer is currently in West Virginia due to the method of shipping chosen by Toshiba.* → {SHIPPING#QUALITY, negative}
  - d. *I dropped this once from the table when my baby girl grabbed me one day and it is still working with NO issues!* → {LAPTOP#QUALITY, positive}
- **OPERATION\_PERFORMANCE** for opinions that focus on the operation, the speed, the power, the stability and the responsiveness of an entity, opinions referring to freezing, crashing issues, as well as for opinions evaluating the battery life. Below are some examples:
    - a. *The battery life seems to be very good.* → {BATTERY#OPERATION\_PERFORMANCE, positive}
    - b. *Love the stability of the Mac software and operating system.* → {SOFTWARE#OPERATION\_PERFORMANCE, positive}, {OS#OPERATION\_PERFORMANCE, positive}
    - c. *I got the blue screen of death the first month I got it.* → {LAPTOP#OPERATION\_PERFORMANCE, negative}
    - d. *Sometimes the screen even goes black on this computer.* → {DISPLAY#OPERATION\_PERFORMANCE, negative}
    - e. *It works exactly like it did the day I took it out of the box.* → {LAPTOP#QUALITY, positive}, {LAPTOP#OPERATION\_PERFORMANCE, positive}

Note that sentence *c* has been assigned the entity label LAPTOP and not DISPLAY, since blue screen issues are related to the operation of the laptop. On the other hand a black screen (*d*) or other types of screen issues may be related to the graphics, to the operation of the laptop or the screen itself. Such cases are assigned the entity label DISPLAY. In *e* the opinions do not refer only to the operation of the laptop, but also to its quality (durability) too (*like it did the day I took it out of the box*).

- **USABILITY** for opinions focusing on the easiness or convenience to use/learn/(un)install/handle/operate/set up/work with/navigate/update/configure/etc., as well as for opinions evaluating properties like the upgradeability, the compatibility, and ergonomics\*. Here are some examples:
  - a. *The mouse jumps around all the time and it clicks stuff I don't want it to!* → {MOUSE#OPERATION\_PERFORMANCE, negative}, {MOUSE#USABILITY, negative}
  - b. *The only downfall is a lot of the software I have won't work with Mac.* → {SOFTWARE#USABILITY, negative}
  - c. *What's really great about this product is you may have a family member who is computer illiterate and you can pretty much just let them loose on this computer without any real supervision.* → {LAPTOP#USABILITY, positive}
  - d. *Upgrading from Windows 7 Starter, thru Windows 7 Home Premium, to Windows 7 Professional was a snap;* → {LAPTOP#USABILITY, positive}
- **DESIGN\_FEATURES** for opinions focusing on the design, the appearance (shape, color, look), the size, the weight and ergonomics\* of an entity, the placement of components, the software design, opinions referring to (extra/missing) features/components, as well as for opinions focusing on the duration and the terms/conditions of the warranty. Below are some examples:

- a. *The unibody design is edgy and durable.* → {LAPTOP#DESIGN\_FEATURES, positive}, {LAPTOP#QUALITY, positive}
- b. *The backlit keys are wonderful when you are working in the dark.* → {KEYBOARD#DESIGN\_FEATURES, positive}
- c. *The magnetic plug-in power charging power cord is great (I even put it to the test by accident)-excellent innovation!* → {POWER\_SUPPLY#DESIGN\_FEATURES, positive}
- d. *I bought it from HSN because it was "bundled" with extra software, but as it turns out, that software just crashes it more often.....* → {LAPTOP#DESIGN\_FEATURES, positive}, {SOFTWARE#GENERAL, negative}, {LAPTOP#OPERATION\_PERFORMANCE, positive}
- e. *It also does not have Bluetooth.* → {LAPTOP#DESIGN\_FEATURES, negative}

NOTE that ergonomics\* is an attribute that is related both to DESIGN\_FEATURES and USABILITY in that a bad/good design of an entity may affect its usability. In such cases, both attribute labels should be assigned e.g. *With the switch being at the top you need to memorize the key combination rather than just flicking a switch.* → {LAPTOP#DESIGN\_FEATURES, negative}, {LAPTOP#USABILITY, negative}

- **PORTABILITY** for opinions focusing on the easiness to transfer the laptop and/or use it in limited space e.g.
  - a. *Very convenient when you travel...* → {LAPTOP#PORTABILITY, positive}
  - b. *This laptop is very large and barely fits in any carrying cases.* → {LAPTOP#DESIGN&FEATURES, positive}, {LAPTOP#PORTABILITY, positive}
- **CONNECTIVITY** for opinions referring to the ability or the easiness to connect via ports, VGA, HDMI, USB, Bluetooth to peripherals etc., as well as for opinions focusing on wireless and internet connections e.g.
  - a. *It is extremely portable and easily connects to WIFI at the library and elsewhere.* → {LAPTOP#PORTABILITY, positive}, {LAPTOP#CONNECTIVITY, positive}
  - b. *I had my IWORKS, Itunes, Email, MS Office, network and printers set up and completely working perfectly within an hour.* → {LAPTOP#USABILITY, positive}, {LAPTOP#CONNECTIVITY, positive}, {LAPTOP#OPERATION\_PERFORMANCE, positive}
  - c. *I can barely use any usb devices because they will not stay connected properly.* → {LAPTOP#CONNECTIVITY, negative}
- **MISCELLANEOUS** for attributes that do not fall into any of the above cases. Such cases may be:
  - Opinions focusing on specific types of a laptop's usage (e.g. *personal use* or *recommendations* for specific purposes like gaming, programming, daily/school/business use etc.). For example in *a*, the reviewer expresses a positive opinion about the quality of the laptop (solid machine) recommending it at the same time for college students:
    - a. *I highly recommend this computer for students looking for a solid machine to get them through college.* → {LAPTOP#MISCELLANEOUS, positive}, {LAPTOP#QUALITY, positive}

- b. *Aside from the trial software and the short battery life, lack of a webcam, it's great.* → {SOFTWARE# MISCELLANEOUS, negative}, {LAPTOP# DESIGN&FEATURES, negative}, {LAPTOP#GENERAL, positive}, {BATTERY# OPERATION&PERFORMANCE, negative}
- c. *The video card is great for media, and above average for gaming, but not a gamer's first choice.* → {GRAPHICS#MISCELLANEOUS, positive}, {GRAPHICS#MISCELLANEOUS, negative}
- o Opinions referring to other types of advantages/disadvantages related to the target entities (e.g. the free printer in *d* or the absence of a hardcopy manual in *e*), and to miscellaneous problems, attributes and opinions in general:
  - d. *And the best part is that it even comes with a free printer* → {LAPTOP#MISCELLANEOUS, positive}
  - e. *The one thing I wish it had was a detailed hardcopy manual.* → {LAPTOP#MISCELLANEOUS, negative}
  - f. *MY ONLY PROBLEM IS I CAN NOT REG. THE PRODUCT KEY.* → {LAPTOP#MISCELLANEOUS, negative}
  - g. *Oh and if that's not bad enough it doesn't come with a recovery cd so you can make one if you know how to or buy one if you buy it the cost is \$25 for two cds.* → {LAPTOP#MISCELLANEOUS, positive}

## 4.2. Mobile Phones

The entity and attribute labels that are described below are based on the SemEval ABSA2015 laptops annotation schema. In the context of the SemEval 2016 ABSA Task, the mobile phones domain is supported for the following languages: Chinese (**Ch**) and Dutch (**Du**).

### 4.2.1. Entity Labels

An entity (that is evaluated) can be the whole phone (e.g. *iPhone 6*, *Galaxy S6*), the tangible (e.g. battery, screen) and abstract parts (e.g. resolution, voice, messages) of it, or the manufacturing company (e.g. *Apple*, *Samsung*) and the services it provides (e.g. pre- and after-sales customer support). The entity types from the laptops domain have been adopted with the appropriate modification. In particular, the entity E of an E#A pair can be assigned the following 17 possible labels:

**PHONE**, **DISPLAY** (=screen, touchscreen, including **GRAPHICS**), **BATTERY**, **CPU** (=processor), **MEMORY** (everything relating to RAM and working memory), **HARD DISC** (everything related to storage and storage capacities), **POWER\_SUPPLY**, **KEYBOARD** (*volume adjustment keys, start button, camera button, virtual keyboard, numpad etc.*), **MULTIMEDIA\_DEVICES**, **PORTS (USB)**, **HARDWARE**, **OS**, **SOFTWARE**, **WARRANTY**, **SHIPPING**, **SUPPORT**, **COMPANY**.

### 4.2.1. Attribute Labels

The attribute A of an E#A pair can be assigned the same labels as in the laptops domain, with the difference that “PORTABILITY” is included in the “DESIGN&FEATURES” label (hence there are 8 possible labels): **GENERAL**, **PRICE**, **QUALITY**,



OPERATION\_PERFORMANCE, USABILITY, DESIGN\_FEATURES (including PORTABILITY), CONNECTIVITY, and MISCELLANEOUS. Below are some examples:

### Chinese

- a. 小米 4 没有宣传的那么好。 → {PHONE#GENERAL, negative}
- b. x903 价格偏高。 → {PHONE#PRICE, negative}
- c. 屏幕质量差了点。 → {DISPLAY#QUALITY, negative}
- d. 所以性能的提升绝对不是纸面数据而已。 → {PHONE#OPERATION\_PERFORMANCE, negative}
- e. 菜单界面也很友好。 → {OS#USABILITY, positive}
- f. 键位也编排的不错。 → {KEYBOARD#DESIGN\_FEATURES, positive}
- g. UI 界面那是没话说了。 → {OS#DESIGN\_FEATURES, positive}
- h. 携带起来稍微有些不方便！ → {PHONE#DESIGN\_FEATURES, negative}
- i. wifi 不能自动连接。 → {PHONE#CONNECTIVITY, negative}
- j. 当然屏幕这么好 → {DISPLAY#QUALITY, positive}

### Dutch

- a. *Voor een aardige prijs krijg je een robuuste mobiel die technisch waterproof (niet officieel) en die lang meegaat.* → {PHONE#PRICE, positive}, {PHONE#QUALITY, positive}
- b. *Super perfecte service van bol.com .* → {SUPPORT#QUALITY, positive}
- c. *een aanrader, heel handig in gebruik, mooi design, werkt heel vlot, snelle levering, super tevreden van...* → {PHONE#GENERAL, positive}, {PHONE#OPERATION\_PERFORMANCE, positive}, {PHONE#USABILITY, positive}, {SHIPPING#QUALITY, positive}
- d. *Wat ik minder vind is zeker de accuduur.* → {BATTERY#OPERATION\_PERFORMANCE, negative}
- e. *De gebruikersinterface van Sony is mooier dan van andere fabrikanten en alles werkt soepel en snel.* → {OS#DESIGN\_FEATURES, positive}, {OS#OPERATION\_PERFORMANCE, positive}
- f. *Apps starten snel op en werken vlot, internet gaat prima.* → {SOFTWARE#OPERATION\_PERFORMANCE, positive}, {PHONE#CONNECTIVITY, positive}
- g. *Enigste nadeel is dat camera niet super goed is van kwaliteit.* → {MULTIMEDIA\_DEVICES#QUALITY, negative}

## 4.3. Digital Cameras

The entity and attribute labels that are described below are based on the SemEval ABSA2015 laptops annotation schema. In the context of the SemEval 2016 ABSA Task, the digital cameras domain is supported for the Chinese language.

### 4.2.1. Entity Labels

The entity types from the laptops domain have been adopted with the appropriate modifications. In particular, the entity E of an E#A pair can be assigned the following labels:

- 15 possible labels from the laptops domain: **DISPLAY**, **CPU**, **MEMORY**, **BATTERY**, **POWER\_SUPPLY**, **KEYBOARD**, **PORTS**, **MULTIMEDIA\_DEVICES**, **HARDWARE**, **OS**, **SOFTWARE**, **WARRANTY**, **SHIPPING**, **SUPPORT**, and **COMPANY**.
- 4 new domain-specific entity types: **CAMERA**, **LENS**, **PHOTO**, and **FOCUS**.

### 4.2.1. Attribute Labels

The attribute A of an E#A pair can be assigned the same 9 labels as in the laptops domain: **GENERAL**, **PRICE**, **QUALITY**, **OPERATION\_PERFORMANCE**, **USABILITY**, **DESIGN\_FEATURES**, **PORTABILITY**, **CONNECTIVITY**, and **MISCELLANEOUS**. Below are some examples:

- a. E16 似乎是个垃圾。 → {CAMERA#GENERAL, *negative*}
- b. 宾得的照片“更有立体感，清秀”。 → {PHOTO#GENERAL, *positive*}
- c. 价格贵不少。 → {CAMERA#PRICE, *negative*}
- d. 配件的维修费用高昂。 → {SUPPORT#PRICE, *negative*}
- e. 镜头素质确实无可挑剔。 → {LENS#QUALITY, *positive*}
- f. LCD 屏幕太破了。 → {DISPLAY#QUALITY, *negative*}
- g. 但感动的镜头的确是一流的外观！ → {LENS#DESIGN\_FEATURES, *positive*}
- h. 尼康的操控性要强些。 → {CAMERA#OPERATION\_PERFORMANCE, *positive*}
- i. 对焦确认功能的确非常好用。 → {FOCUS#USABILITY, *positive*}
- j. 菜单界面也很友好。 → {OS#USABILITY, *positive*}
- k. 更轻便的机身也便于携带。 → {CAMERA#PORTABILITY, *positive*}

## 5. Telecommunications (Telecom)

In the context of the SemEval 2016 ABSA Task, the telecom domain is supported by Turkcell Global Bilgi (Turkcell Global Bilgi, 2015)<sup>3</sup> for the Turkish language (Twitter data).

### 5.1. Entity Labels

An entity (that is evaluated) can be the telecom operator as a whole (e.g. operator, Turkcell, Turk Telekom), its applications and services, the internet and customer services that are offered, etc. The entity E of an {E#A} pair can be assigned one of the following 5 labels. For each identified entity type, the annotators should also tag the respective entity mention (OTE) or assign the value NULL when there is no explicit mention of the evaluated entity.

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<sup>3</sup> Turkcell Global Bilgi. Web. 7 Dec. 2015. <<http://www.global-bilgi.com.tr/>>.

- **DEVICE** for opinions focusing on the device in general or in terms of specific properties, hardware/software options etc. e.g. “*turkcell vinn teknolojinin nimetlerinden biri bence.*” → {**DEVICE**, “*turkcell vinn*”}
- **INTERNET** for opinions focusing on the internet in general or in terms of connection quality, download/upload speed etc. Below are some examples:
  - a. *Vodafone’un interneti berbat.* → {**INTERNET**, “*Vodafone’un interneti*”}
  - b. *telefonumun interneti evdeki internetten daha hızlı , teşekkürler avea internet.* → {**INTERNET**, “*telefonumun internet*”}
- **CUSTOMER SERVICES** for opinions focusing on the customer service, on the promptness and quality of the customer service in general, the problem solving, the staff’s attitude and professionalism, the wait time, the options offered (e.g. payback), etc. e.g. “*turkcell de öyle bir müşteri hizmetlerine denk geldim ki bir harikaydı*” → {**CUSTOMER SERVICES**, “*müşteri hizmetlerine*”}
- **APPLICATION\_SERVICE** for opinions focusing on the applications or services that are offered, on the quality of the telecom operator’s application/service in general, the accessibility, the stability, the variety and the price, etc. Below are some examples: “*Turkcell müzik süper!*” → {**APPLICATION\_SERVICE**, “*Turkcell müzik*”}
- **TELECOM OPERATOR** for opinions evaluating the telecom operator as whole not focusing on any of the above four entity types e.g.
  - a. *Turkcell bir kere attın anladık ama bu 3 oldu yani* → {**TELECOM OPERATOR**, “*Turkcell*”}
  - b. *Ulan avea yapılır mı bu?* → {**TELECOM OPERATOR**, “*avea*”}

## 5.2. Attribute Labels

The attribute A of an {E#A} pair can be assigned one of the following 6 labels. In the examples below the respective polarity label is also provided.

- **GENERAL** This attribute label is assigned to sentences that express general positive or negative sentiment about an entity type e.g.
  - a. *Ulan avea yapılır mı bu?* → {**TELECOM OPERATOR#GENERAL**, “*avea*”, *negative*}
  - b. *turkcell’le hayata bağlanıyoruz ama müşteri hizmetlerine bağlanamıyoruz* → {**CUSTOMER SERVICES#GENERAL**, “*müşteri hizmetlerine*”, *negative*}
  - c. *Vodafone’un interneti berbat.* → {**INTERNET#GENERAL**, “*Vodafone’un interneti*”, *negative*}
  - d. *Turkcell müzik süper!* → {**APPLICATION\_SERVICE#GENERAL**, “*Turkcell müzik*”, *positive*}
- **PRICE\_INVOICE** for opinions that refer to the prices of the services, the applications or the telecom operator in general e.g. “*internetin çok pahalı, @turkcell.*” → {**INTERNET#PRICE\_INVOICE**, “*internetin*”, *negative*}

- **SPEED** for opinions focusing on the response time in customer services, the waiting time on calling, the connection time to the web, the upload/download speeds e.g. “*telefonumun interneti evdeki internetten daha hızlı, teşekkürler avea internet.*” → {INTERNET#SPEED, “*telefonumun internet*”, *positive*}
- a. *Vodafone’un interneti berbat.* → {INTERNET#SPEED, “*Vodafone’un interneti*”, *negative*}
- b. *Avea müşteri hizmetleri sorunumu anında çözdü.* → {CUSTOMER SERVICES#SPEED, “*Avea müşteri hizmetleri*”, *positive*}
- c. *test ettim , onaylıyorum . en hızlısı turkcell abi . kim ne derse desin .* → {TELECOM OPERATOR#SPEED, “*turkcell*”, *positive*}
  
- **CAMPAIGN\_ADVERTISEMENT** for opinions focusing on the campaigns creating by the telecom operator, the advertisements for the up and coming applications, services or the telecom operator in general e.g.
  - a. *ya bu şahin sucuk reklamı nedir ?? turkcell yanında orkid reklamları da yaparsa hiç şaşırمام !!* → {TELECOM OPERATOR# CAMPAIGN\_ADVERTISEMENT, “*reklamı*”, *negative*}
  - b. *sahur yazıp 2222 gönderin . 2 : 0 ile 6 : 0 arası 2 gb beleş internet paketi geliyor . hem de 1 ay bedava . turkcell’i seviyoruz :d* → {INTERNET#CAMPAIGN\_ADVERTISEMENT, “*internet paketi*”, *positive*}
  
- **COVERAGE** for opinions focusing on the coverage of telecom operator e.g.
  - a. *şu an bolu tünelindeyiz ve telefonum ful çekiyor teşekkürler turkcell bu tutumunu köyümün en ücra köşelerinde de göstermen dileğiyle . . .* → {TELECOM OPERATOR#COVERAGE, “*çekiyor*”, *positive*}
  - b. *#Internet kopuyor sürekli :( @turkcell* → {INTERNET#COVERAGE, “*Internet*”, *positive*}
  
- **MISCELLANEOUS** for attributes that do not fall into any of the aforementioned cases e.g. “*Turkcell bu kız bu kadar ne konuşuyor diyip konuşmalarımı dinlemeye alabilir*” → {TELECOM OPERATOR#MISCELLANEOUS, “*NULL*”, *neutral*}

## References

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- Pontiki, M., Galanis, D., Pavlopoulos, J., Papageorgiou, H., Androutsopoulos, I., and Manandhar, S.. (2014). Semeval-2014 Task 4: Aspect Based Sentiment Analysis. In *Proceedings of the 8th International Workshop on Semantic Evaluation (SemEval 2014)*, pages 27–35, Dublin, Ireland. Association for Computational Linguistics.