CONTENTS

I. GENERAL

What is SentEMO?
What are ABSA and ABEA?
How does annotation work?

II. ANNOTATION

What is the purpose of annotating?
How should an aspect be tagged?
How should a NULL aspect be tagged?
How should a sentiment be tagged?
How should an emotion be tagged?
What should not be annotated?

III. ANNOTATION IN INCEPTION

How do I start an annotation in INCEPTION?
How does the INCEPTION annotation interface work?
How do I annotate an aspect sentiment in INCEPTION?
How do I annotate NULL in INCEPTION?
How do I connect tokens of the same term that are not adjacent to each other?
How do I annotate emotion in INCEPTION?
How do I indicate that I have doubts about my annotation?
How do I save my annotation?
I. **GENERAL**

**What is SentEMO?**
SentEMO is a project in which Ghent University and Artevelde University College have joined forces with partners from the industry ([https://www.sentemo.org/](https://www.sentemo.org/)) with a view to developing a multilingual, self-learning software platform for aspect-based sentiment and emotion analysis. For this platform, annotated data are required from different domains. This document contains the guidelines for the annotation of data for the purposes of ABSA and ABEA.

**What are ABSA and ABEA?**
ABSA stands for *aspect-based sentiment analysis*. Sentiment analysis is a computational linguistics technique for automatically recognising positive or negative opinions in texts. Current systems detect sentiment on sentence level. This means that if several expressions of sentiment occur in a sentence, these systems produce a generalised account of these sentiments. ABSA tries to distinguish not only different expressions within the same sentence, but also the topic to which the expression of sentiment relates. This breaks down a general sentiment on sentence level into detailed aspects. ABEA stands for *aspect-based emotion analysis* and follows the same structure as ABSA. An attempt has not yet been made to conduct emotion analysis at the aspect level.

**How does annotation work?**
We annotate datasets from the following domains: FMCG-retail, Hotel, Airline, Hospital and Telecom. Each dataset contains 1000 reviews written by customers, guests and users. The work is divided among the different annotators. We work with an online annotation tool, INCEpTION.
II. ANNOTATION

What is the purpose of annotating?
The purpose of annotating is to identify all pairs of aspect and sentiment terms in the reviews. Pairs are only considered within a sentence, and thus cannot span multiple sentences. Both the aspect and the sentiment term can contain several words or tokens (tokens are words and punctuation marks). The aspect term contains the tokens that express the subject of the opinion, while the sentiment term contains the tokens that express the opinion. In addition, the aspect is tagged according to a list of categories relevant to the domain. The polarity of the sentiment is tagged. If an aspect-sentiment pair lacks an explicit expression of the aspect, the sentiment is associated with a NULL aspect. Given a pair of aspect and sentiment terms, or a NULL aspect, the emotion that seems most applicable to the writer's tone in that piece of text is chosen from a list of basic emotions. Since clues to that choice may be very implicit, the emotion is associated with the aspect terms or the NULL terms. The emotion tagging is seen as an extension of the sentiment annotations.

How should an aspect be tagged?
An aspect belongs to a category, which is defined by an entity and an attribute. An entity refers to a certain part that is important in the domain in question. An attribute defines a property of the entity and details the category of the aspect.

- For an overview of all possible tags per domain, see the annotation scheme.
- Every entity has general and misc as possible attributes. If the aspect is not explicit or detailed enough to determine the attribute, general can be tagged. If there is an explicit attribute mentioned for the entity that is not in the tagset, misc can be tagged.
- For a brief explanation of the other categories, see the annotation scheme.
- The annotating is done in a concise manner. This means that when selecting tokens for an aspect term, only the most substantive words that are relevant to the situation are selected. For example, articles are omitted in your selection.

How should a NULL aspect be tagged?
NULL aspects are only used when a sentence contains sentiment terms, but no terms explicitly related to an aspect. In the following situations, the sentiment should be tagged with a NULL aspect:

- The aspect is missing.

This includes slightly longer terms that express a general sentiment.
Sometimes a review is written very informally, and it is simply not clear what a sentiment refers to. If such a sentence does clearly contain an emotion, it may be annotated entirely as a NULL aspect.

- The aspect is implicit. Think of "there is" constructions and similar.

- The aspect contains no relevant information. All referring pronouns and personal pronouns are included.

Despite the absence of an explicit aspect, the aspect category can usually be deduced from the rest of the sentence or the other sentences. If this is not possible, tag the NULL aspect as generally as possible, e.g. PRODUCT_general or HOTEL_general.

Note that it is still the intention to annotate nouns as explicit aspects whenever possible. Compare

In the first case, there is only an implicit reference to the product with the term "him", and so "very nice" may be tagged as a NULL aspect. In the second case, we recognise "delay" as an explicit aspect, to which "one hour" is tagged as a sentiment. So, start from the presence or absence of an explicit aspect, even if the sentiment terms are very implicit. The name of a company or product can also act as an explicit aspect:

How should a sentiment be tagged?
Sentiment is tagged on a polarity scale from very negative to very positive. The possible tags for polarity are very positive, positive, neutral, negative and very negative.

- Positive and negative are tagged in most cases.

- Very positive and very negative tags are used when the sentiment term contains one or more tokens that reinforce the sentiment.

- Neutral is tagged if the tokens of the sentiment term do not express an unambiguous opinion.
- Often, a writer does not express sentiment through adjectives or adverbs, but through a description of the situation. This yields more implicit sentiment terms, which can still be annotated. Only the terms that have a subjective dimension need to be annotated. For many descriptions, it is possible to rely on our common sense to decide whether something is positive or negative. If that is not the case, there is no need to annotate the pair.

- Nouns, in whatever conjugation, may contain relevant information. They can be included in the sentiment term.

- Here too, the rule is to annotate concisely.

**How should an emotion be tagged?**

There are various frameworks for tagging emotions. For SentEMO, we draw on Plutchik's Wheel of Emotions (Plutchik 1991), to which the following diagram pertains.
We start with the eight basic emotions (the middle circle in the diagram): joy, trust, fear, surprise, sadness, disgust, anger and anticipation. Satisfaction, dissatisfaction and neutral are added to this list for situations in which the basic emotions are somewhat too specific. For each tag, the author's assumed state is explained and some examples are given.

- **satisfaction**: feeling happy, being content, where the emotion joy is too strong and a degree of satisfaction is simply expressed.

- **joy**: feeling joyful, being enthusiastic, being very happy.
- **trust**: sense of reliability, safety, gives a warm feeling. Also when the writer would recommend a company or product.

- **dissatisfaction**: feeling displeased, when a negative feeling is expressed but the label anger is too strong.

- **anger**: feeling vexed, resentful, not satisfied at all.

- **fear**: being afraid, panicking, not at all at ease, feeling unsafe.

- **sadness**: unhappy, feeling dejected about something, not being happy.

- **disgust**: revolting, unpleasant, distasteful, “eugh!”.

- **surprise**: to be astonished, to be taken aback.

- **anticipation**: curious, inquisitive, looking forward to. The writer clearly has high expectations and expresses them. This is the writer's own feeling, not the feeling he is trying to instil in the reader.
- distrust: feeling suspicious, betrayed, not having faith in the organisation/product.

- neutral: the lack of any emotion. Here, the sentiment will also be neutral. It is impossible to tag neutral if the sentiment is positive, negative, very_positive or indeed, very_negative.

In many cases, the consideration between the following tags will have to be made.

- satisfaction or joy: joy is the stronger emotion of the two. It is obvious from the text that the writer is very satisfied or has enjoyed something. If the sentiment was tagged as being very_pos, chances are anyway that joy applies, even though this will not always be the case. In general, satisfaction is likely to be more common. When sentiments are reinforced, always follow your instincts.

  - For example: joy is good here because the writer is clearly very excited:

    Thank you so much for such a lovely stay

    In this example, less enthusiasm can be inferred, so satisfaction is better:

- satisfaction or trust: in the case of trust, a feeling of reliance is expressed. For example, the writer makes it clear that they have been a customer for a long time and have had a good experience on several occasions.

- (dis)satisfaction or surprise: in the case of surprise, something unexpected has happened. If the writer notes that something has improved/worsened, you tag (dis)satisfaction.

- dissatisfaction or anger: anger is the stronger emotion of the two. You can clearly infer from the text that the writer is expressing deep dissatisfaction. If irritation or frustration is clearly being communicated, you can also use anger. If the sentiment is tagged as being very_neg, chances are that anger will apply, even though that is not always the case. When it comes to reinforced sentiments, always follow your feelings. In general, dissatisfaction will be more common.

  - For example: anger is applicable here, because there is clearly frustration in the reinforced sentiment:

    In this example, dissatisfaction is okay, even though the sentiment was reinforced. The writer is clearly dissatisfied, but there is no evidence of frustration or anger.
- dissatisfaction or sadness: sadness is the stronger emotion of the two. It is obvious from the text that the writer is expressing sadness and disappointment. If the sentiment is tagged as being very_neg, chances are that anger will apply, even though that is not always the case. When it comes to reinforced sentiments, always follow your instincts. In general, dissatisfaction will be more common.

For example: sadness applies here because you can clearly feel disappointment in the heightened sentiment:

```
Was very unhappy to see that when it arrived, it was from the US.
```

In this example, dissatisfaction is okay. The writer is clearly dissatisfied, but no disappointment or unhappy feeling is communicated, despite the increased sentiment:

```
Very cheaply made...95% plastic and very little power.
```

**What should not be annotated?**

Besides the situation in which a sentence does not contain any pairs of aspect and sentiment terms or some sentiment terms, there are other situations where no annotation is required.

- The wording is too narrative.

```
She had to wait for 13 hours in Brussels but she got to the destination eventually.
```

- The wording is not sufficiently explicit.

```
It's definitely not meant for very large rooms or open concept areas, as it says in the description.
```

- The wording is too extensive or too long-winded.

```
Poor business for them, and many other people will never travel with them again, they will disappear as they don't have long term vision.
```

- The pair of aspect-sentence terms does not relate directly to the topic under discussion in the review. For example, because it refers to another airline/hotel/shop/etc. or draws a comparison with them. We call this ‘out of scope’.

```
Unfortunately our Easter travel plan also got cancellations for flights with other companies like Vueling and Olympic/Aegean who reject to refund only offering credit vouchers.
```

- The emotion is not related to the interaction or experience with the company under discussion in the review.

```
At the beginning of 2010 sadly my wife was diagnosed with Breast Cancer.
```

NB: Terms that contain spelling or language errors, to the extent that the word or meaning can still be deduced, **should** be annotated. This is a frequent occurrence.
III. ANNOTATION IN INCEPTION

How do I start an annotation in INCEpTION?

1. Go to http://inception.lt3.ugent.be/ and log in with your username and password. You will find a list of all SentEMO annotation projects, ordered by domain.
2. Select the domain you want to work in. You will find a list of annotators.
3. Select your own name. You will find a list of documents. Each document contains one review. Documents you have already opened are marked in blue.
4. Select the document you want to work in. You will see the annotation interface in which the selected document is loaded. The document is displayed line by line by line.

How does the INCEPTION annotation interface work?

- Use the control panel to open files, go to the previous or next file, or navigate to pages in the file (check that you have annotated all sentences in the file!).

  **Shortcuts:**

<table>
<thead>
<tr>
<th>Key</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOME</td>
<td>jump to first sentence</td>
</tr>
<tr>
<td>END</td>
<td>jump to last sentence</td>
</tr>
<tr>
<td>PAGE DOWN</td>
<td>move to the next page, if not in the last page already</td>
</tr>
<tr>
<td>PAGE UP</td>
<td>move to previous page, if not already in the first page</td>
</tr>
<tr>
<td>SHIFT-PAGE DOWN</td>
<td>go to next document in project, if available</td>
</tr>
<tr>
<td>SHIFT-PAGE UP</td>
<td>go to previous document in project, if available</td>
</tr>
</tbody>
</table>

- To start your annotation again, click on the recycle sign.
- The lock is to indicate that you have completed your annotation. This is redundant, so do not click on it.
- To adjust the number of rows that are displayed per page, click on the cog icon, and under General Display Preferences, adjust the page size.
- The review text is automatically split per sentence and displayed on a new line.
- In the review text, select the tokens you want to annotate.
- Use the **annotation panel** to tag your selections correctly.

### How do I annotate an aspect sentiment in INCEPTION?

The standard annotation form consists of an aspect, a sentiment and a link that connects the sentiment to the aspect. The terms that belong to the annotation are always newly tagged. A tagged term is therefore not used for more than one annotation.

1. **Check.** Before you start your annotation, read through the review to check for any inconsistencies.
   a. Check whether the review is written in Dutch, and whether the sentences are split correctly. If this is not the case, make a note of the document name in the problem document under the tab ERRORS and skip the document for now.
   b. Our data should not contain any private information, such as personal names, telephone numbers and addresses. Should you come across them, mark the tokens containing the information as follows:
      i. In the annotation panel, select: *Layer > anon.*
      ii. Select the token(s) by clicking and dragging. You can also select a single token by double-clicking.

2. **Layer.** To annotate pairs of aspect and sentiment terms, select *Layer > term* in the annotation panel.

3. **Aspect.**
   a. Determine a token or a set of tokens that cover the topic on which sentiment is expressed. Select the token(s) by clicking and dragging. You can also select a single token by double-clicking.
   b. Indicate in the annotation panel that you have selected an aspect: *asp/sent/null > aspect.*
   c. In the annotation panel, indicate under which aspect category the topic falls: *aspect category > [category].*

4. **Sentiment.**
   a. Determine a token or a number of tokens in which the sentiment is expressed. Select the token(s) by clicking and dragging. You can also select a single token by double-clicking.
   b. Indicate in the annotation panel that you have selected the sentiment: select *asp/sent/null > sentiment.*
   c. In the annotation panel, indicate the polarity of the sentiment: *sentiment polarity > [polarity].*

5. **Link.**
a. Click on the sentiment term and drag an arrow to the corresponding aspect term.

b. In the annotation panel, indicate that you have linked the sentiment to the aspect: select relation type > is_about.

How do I annotate NULL in INCEpTION?
In some cases, a sentiment term has no corresponding aspect term (see: When should a NULL aspect be tagged?). In those cases, attach the full annotation to the sentiment term. Mark the annotation with NULL and determine the aspect category as precisely as possible.

1. Layer. To annotate NULL, in the annotation panel select Layer > term.

2. NULL.
   a. Determine a token or a number of tokens in which the sentiment is expressed. Select the token(s) by clicking and dragging. You can also select a single token by double-clicking.
   b. In the annotation panel, indicate that you are annotating a NULL aspect: asp/sent/null > NULL.

3. Aspect.
   a. In the annotation panel, indicate which aspect category the topic falls under: aspect category > [category].

4. Sentiment.
   a. In the annotation panel, specify the polarity of the sentiment: sentiment polarity > [polarity].

How do I connect tokens of the same term that are not adjacent to each other?
Sometimes tokens belonging to the same term are not directly adjacent to each other in the sentence.

1. Aspect and sentiment.
   a. Annotate sentiment and aspect as usual, without the is_about link.

2. Linking annotations.
   a. Identify the annotations that belong to the same term. Work from the beginning to the end of the sentence. The connection is like a chain: an annotation is connected to the next annotation, and then this annotation is connected to the next annotation.
   b. Click and drag an arrow between the annotations.
   c. In the Annotation panel, indicate that you have connected annotations of the same term: select relation type > in_span_with.

3. Link.
a. Identify the last annotation that belongs to the term. Use that annotation to create the aspect-sentiment link.
b. Click on the sentiment term and drag an arrow to the corresponding aspect term.
c. In the annotation panel, indicate that you have linked the sentiment to the aspect: select relation type > is_about.

How do I annotate emotion in INCEpTION?
The emotion annotations build on the aspect-sentiment annotations. Each pair of aspect and sentiment terms or NULL term must be provided with an emotion tag. The emotion is associated with the aspect term or with the NULL term.

1. Check. Since you start from reviews of which the sentiment aspect terms and NULL terms should already be annotated, check whether all aspects are tagged in the review, and add where necessary. If you notice an emotion in a sentence, but a clear aspect is missing, you may indicate a long NULL term.
2. Layer. To annotate an emotion, in the annotation panel, select Layer > term.
3. Emotion.
   a. Select an aspect or a NULL term.
   b. In the annotation panel, indicate which emotion category most closely relates to the sentiment aspect term or NULL term: emotion category > [category].

How do I indicate that I have doubts about my annotation?
If you are really unsure about a particular sentence, annotate your best guess. You can indicate your doubt by entering the document name and sentence number in the problem document under the tab CASES OF DOUBT. This will then be reviewed later.

How do I save my annotation?
All your changes are automatically saved. As soon as you are finished, you can simply click INCEPTION away. You will be automatically logged out after 30 minutes of inactivity.