1. What do we want to do?
We want to analyse acoustically geminate consonants in Polish. Geminates are double consonants in words such as *wanna*, *panna*, *gamma*, *Jagiełło*, *dżdżownica*. Because we are influenced by orthographic representations, it is generally thought that geminates are rearticulated, which means that the second consonant is separated from the first consonant (e.g., *lek_ki*). However, it is not true and many geminates in natural speech are produced with one articulatory gesture and so the two consonants are not separated. So how do we then perceive the difference between *lekki* and *leki* or between *panna* and *pana*? This is what we want to find out in this project. We want to record a representative sample of geminates and analyse them acoustically. Unlike in Polish, geminates in many other languages are well described and so we want to measure the known acoustic properties and see if they also characterise Polish geminates. Next, we want to investigate how Polish people perceive the difference between, for example, *panna* and *pana*, and which acoustic properties they are most sensitive to. Finally, we want to collect all the recordings of geminates into a recording database POLGEM and make it available for other researchers and for other future studies on geminates in the world's languages.

2. How do we want to do it?
We will collect a corpus of Polish geminates by recording 60 speakers of Polish who will produce geminates in different speech modes (e.g., careful speech vs. rapid speech). We will use speech-analysis software and measure all the known acoustic properties of geminates and compare them to single consonants. After that, we will create stimuli for perception experiments. Those words will have manipulated acoustic properties, which will help us accurately determine which properties are used by Polish listeners in differentiating between e.g., *cenny* and *ceny* or *ranny* and *rany*. We will use identification tests (indicate which word you hear) and more sensitive discrimination tests (say if these words are same or different). For some of these tests we will also collect reaction times to see if geminates with rearticulation (*lek_ki*) are recognised faster than single-articulated geminates (*lekki*).

3. Why do we want to do it?
The reason is that other languages with geminates are well-described and we know a lot about acoustic properties of non-Polish geminates. Many experiments have been conducted with, for example, Italian or Japanese. There are even studies for English, which does not have true word-internal geminates but only has across-morpheme gemination (e.g., *unnecessary*). Polish is largely underresearched in this area and we want to show how Polish differs from or is similar to other previously researched languages. Our results may also be practically used in automatic speech recognition systems and in methods of automatic transcription.