

Appendix 1 - Indelly Configuration

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{
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(Friulian,Italian)))));",
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64]}, {"Name": "Vowel", "Set": [0, 2, 4, 6, 7, 9, 11, 15, 17, 23, 24, 25, 27, 34, 35, 36, 42, 47,
48, 49, 51, 53, 55, 65, 69, 72, 74, 79, 82]}, {"Name": "Nasal Consonant", "Set": [13, 21, 46, 60
]}, {"Name": "Non Syllabic Sonorants", "Set": [8, 12, 26, 50]}, {"Name": "Consonants", "Set": [1, 3,
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71, 73, 75, 76, 77, 78, 80, 81]}],
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      { "Taxon": "Italian", "Segments": [-1, 7, -1, 6]},
      { "Taxon": "PortugueseBrazil", "Segments": [-1, 0, -1, 8]},
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      { "Taxon": "Catalan", "Segments": [-1, 3, -1, 9]},
      { "Taxon": "Walloon", "Segments": [-1, 10, -1, 11]},
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      { "Taxon": "PortugueseBrazil", "Segments": [13, 9, 12, -1, 14]},
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      { "Taxon": "Catalan", "Segments": [19, 15, -1, 14]},
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      { "Taxon": "Romanian", "Segments": [18, 17, -1, -1]}
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  ]
}
```

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  {"Taxon": "Friulian", "Segments": [-1, 24, -1, 20, -1, -1, -1, 7, -1]}
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  {"Taxon": "PortugueseBrazil", "Segments": [-1, -1, 26, 24, -1]},
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  {"Taxon": "Catalan", "Segments": [4, -1, 28, 24, -1]},
  {"Taxon": "Walloon", "Segments": [-1, -1, 26, 24, -1]},
  {"Taxon": "Romanian", "Segments": [-1, -1, 26, 24, -1]}
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  {"Taxon": "PortugueseBrazil", "Segments": [24, 7]},
  {"Taxon": "Portuguese", "Segments": [25, 7]}
]},
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  {"Taxon": "Italian", "Segments": [20, -1, 7, -1]},
  {"Taxon": "Catalan", "Segments": [20, -1, 7, -1]},
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  {"Taxon": "Friulian", "Segments": [20, 8, 7, -1]}
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  {"Taxon": "Catalan", "Segments": [20, -1, 35, -1]},
  {"Taxon": "Walloon", "Segments": [20, 8, 36, -1]},
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{
  "Taxon": "Friulian", "Segments": [37, -1, 0, -1]},
  "Taxon": "Romanian", "Segments": [37, -1, 0, -1]}
}],
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    {"Taxon": "Italian", "Segments": [20, 8, 24, 13, 33, 6]},
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    {"Taxon": "Portuguese", "Segments": [20, 8, 39, -1, 33, 15]},
    {"Taxon": "Catalan", "Segments": [20, 8, 24, 13, -1, -1]},
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    {"Taxon": "Italian", "Segments": [20, 6, 21, 0, -1, -1]},
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    {"Taxon": "Portuguese", "Segments": [20, 6, 21, 15, -1, -1]},
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    {"Taxon": "Friulian", "Segments": [15, 46, -1, -1]},
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    {"Taxon": "Portuguese", "Segments": [33, -1, 17, 16]},
    {"Taxon": "Catalan", "Segments": [33, -1, 6, 14]},
    {"Taxon": "Walloon", "Segments": [33, -1, 48, -1]},
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    {"Taxon": "Romanian", "Segments": [33, -1, 17, -1]}
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  {"Taxon": "Italian", "Segments": [33, 15, -1, 0]},
  {"Taxon": "Romanian", "Segments": [33, 6, 8, 4]}
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  {"Taxon": "Catalan", "Segments": [40, 50, -1, 35, 14]},
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  {"Taxon": "Spanish", "Segments": [57, 7, 13, 20, -1, 6]},
  {"Taxon": "Italian", "Segments": [37, 7, 46, 20, 8, 0]},
  {"Taxon": "PortugueseBrazil", "Segments": [14, 58, -1, 20, -1, 15]},
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  {"Taxon": "Friulian", "Segments": [26, 15, 13, 20, -1, -1, -1]},
  {"Taxon": "Romanian", "Segments": [26, 15, 13, 59, -1, -1, -1]}
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  {"Taxon": "Italian", "Segments": [26, 24, 50, 1, 6, -1]},
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  {"Taxon": "Italian", "Segments": [63, 0, 16, 16, 0, -1]},
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  {"Taxon": "Portuguese", "Segments": [63, 65, 16, -1, 34, -1]},
  {"Taxon": "Catalan", "Segments": [63, 0, 16, -1, -1, -1]},
  {"Taxon": "Friulian", "Segments": [63, 35, 14, -1, -1, -1]},
```

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  "Taxon": "Romanian", "Segments": [63, 0, 16, 40, 0, -1]}
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  {"Taxon": "PortugueseBrazil", "Segments": [24, 18, 7, -1]},
  {"Taxon": "Portuguese", "Segments": [24, 18, 34, -1]},
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  {"Taxon": "Walloon", "Segments": [-1, -1, 42, -1, -1, 22, -1, 36, -1, -1, -1, -1]},
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  {"Taxon": "Italian", "Segments": [63, 24, 14, 14, 0, 50, 6, -1]},
  {"Taxon": "PortugueseBrazil", "Segments": [63, 24, -1, 14, 25, 54, 15, -1]},
  {"Taxon": "Portuguese", "Segments": [63, 24, -1, 14, 25, 54, 15, -1]},
  {"Taxon": "Romanian", "Segments": [63, 24, -1, 14, 4, 54, 0, -1]}
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  {"Taxon": "Latin", "Segments": [19, 7, 19, -1, 0, 50, 0]},
  {"Taxon": "French", "Segments": [19, -1, -1, 8, 53, 52, -1]},
  {"Taxon": "Spanish", "Segments": [19, 0, 19, -1, 0, 54, -1]},
  {"Taxon": "Italian", "Segments": [19, 0, -1, -1, -1, 54, 0]},
  {"Taxon": "PortugueseBrazil", "Segments": [19, 0, 19, -1, 0, 52, -1]},
  {"Taxon": "Portuguese", "Segments": [19, 34, 68, -1, 0, 54, -1]},
  {"Taxon": "Catalan", "Segments": [19, 35, 8, -1, -1, 54, 4]},
  {"Taxon": "Walloon", "Segments": [19, -1, -1, -1, 48, 52, -1]},
  {"Taxon": "Friulian", "Segments": [19, 0, 18, 7, -1, -1, -1]},
  {"Taxon": "Romanian", "Segments": [19, -1, -1, -1, 69, -1, -1]}
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  {"Taxon": "PortugueseBrazil", "Segments": [20, 6, 21, 0, -1, -1, -1, -1]},
  {"Taxon": "Portuguese", "Segments": [20, 15, 21, -1, -1, 0, 54, -1]}
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  {"Taxon": "Spanish", "Segments": [21, 24, 13, 33, 15, 20, 24, 54, -1]},
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  {"Taxon": "Walloon", "Segments": [21, 24, 60, -1, -1, -1, 23, -1, -1]},
  {"Taxon": "Friulian", "Segments": [21, 24, 46, 70, -1, -1, 24, -1, -1]},
  {"Taxon": "Romanian", "Segments": [21, 34, 13, -1, -1, 20, 24, -1, -1]}
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Appendix 1 - Indelly Configuration

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    "Taxon": "Spanish", "Segments": [0, 14, 40, 54, 0, -1, 5, 24]},
    "Taxon": "Italian", "Segments": [-1, 14, 40, -1, 0, 26, 26, 24]},
    "Taxon": "PortugueseBrazil", "Segments": [7, 14, 40, 54, 0, -1, 26, 25]},
    "Taxon": "Portuguese", "Segments": [34, 16, 40, 54, 0, -1, 26, 25]},
  ]
}
```

Appendix 1 - Indelly Configuration

```
{
  "Taxon": "Catalan", "Segments": [4, 14, 40, -1, 35, -1, 26, -1]},
  {"Taxon": "Walloon", "Segments": [-1, 14, 40, -1, 48, -1, 26, -1]},
  {"Taxon": "Friulian", "Segments": [-1, 14, 40, -1, 35, -1, 26, 0]},
  {"Taxon": "Romanian", "Segments": [-1, 14, 40, -1, 69, -1, -1, -1]}
}],
{"Name": "Water", "Data": [
  {"Taxon": "Latin", "Segments": [24, -1, 29, -1, 24]},
  {"Taxon": "French", "Segments": [6, -1, -1, -1, -1]},
  {"Taxon": "Spanish", "Segments": [24, -1, 62, 8, 24]},
  {"Taxon": "Italian", "Segments": [24, 20, 20, 8, 24]},
  {"Taxon": "PortugueseBrazil", "Segments": [24, -1, 1, 8, 25]},
  {"Taxon": "Portuguese", "Segments": [24, -1, 1, 8, 25]},
  {"Taxon": "Catalan", "Segments": [49, -1, 62, 8, 4]},
  {"Taxon": "Walloon", "Segments": [36, -1, -1, 8, -1]},
  {"Taxon": "Friulian", "Segments": [24, -1, 59, -1, 0]},
  {"Taxon": "Romanian", "Segments": [24, -1, 63, -1, 4]}
]},
{"Name": "Rain", "Data": [
  {"Taxon": "Latin", "Segments": [63, 26, 15, -1, 8, 7, 24]},
  {"Taxon": "French", "Segments": [63, 26, 75, -1, -1, 7, -1]},
  {"Taxon": "Spanish", "Segments": [5, -1, 15, -1, 19, 12, 24]},
  {"Taxon": "Italian", "Segments": [63, 12, 6, 33, 10, -1, 24]},
  {"Taxon": "PortugueseBrazil", "Segments": [16, -1, 15, -1, 18, -1, 25]},
  {"Taxon": "Portuguese", "Segments": [16, -1, 15, -1, 18, -1, 25]},
  {"Taxon": "Catalan", "Segments": [63, 26, 15, -1, 3, -1, 4]},
  {"Taxon": "Walloon", "Segments": [63, 26, 42, -1, 52, -1, -1]},
  {"Taxon": "Friulian", "Segments": [63, 26, 6, -1, -1, 12, 0]},
  {"Taxon": "Romanian", "Segments": [63, 26, 74, -1, -1, 12, 0]}
]},
{"Name": "Lake", "Data": [
  {"Taxon": "Latin", "Segments": [26, 24, 20, 15, 21]},
  {"Taxon": "French", "Segments": [26, 24, 20, -1, -1]},
  {"Taxon": "Spanish", "Segments": [26, 24, 59, 6, -1]},
  {"Taxon": "Italian", "Segments": [26, 24, 1, 6, -1]},
  {"Taxon": "PortugueseBrazil", "Segments": [26, 24, 1, 15, -1]},
  {"Taxon": "Portuguese", "Segments": [26, 24, 62, 15, -1]},
  {"Taxon": "Catalan", "Segments": [28, 24, 20, -1, -1]},
  {"Taxon": "Walloon", "Segments": [26, 24, 20, -1, -1]},
  {"Taxon": "Friulian", "Segments": [26, 27, 40, -1, -1]},
  {"Taxon": "Romanian", "Segments": [26, 24, 20, -1, -1]}
]},
{"Name": "Sea", "Data": [
  {"Taxon": "Latin", "Segments": [21, 24, 50, 0]},
  {"Taxon": "French", "Segments": [21, 35, 52, -1]},
  {"Taxon": "Spanish", "Segments": [21, 24, 54, -1]},
  {"Taxon": "Italian", "Segments": [21, 24, 50, 0]},
  {"Taxon": "PortugueseBrazil", "Segments": [21, 24, 52, -1]},
  {"Taxon": "Portuguese", "Segments": [21, 24, 54, -1]},
  {"Taxon": "Catalan", "Segments": [21, 24, 50, -1]},
  {"Taxon": "Walloon", "Segments": [21, 0, 52, -1]},
  {"Taxon": "Friulian", "Segments": [21, 27, 50, -1]},
```

Appendix 1 - Indelly Configuration

```
{
  "Taxon": "Romanian", "Segments": [21, 24, 50, 0]}
}},
{"Name": "Salt", "Data": [
  {"Taxon": "Latin", "Segments": [14, 27, 26, 0, 21]},
  {"Taxon": "French", "Segments": [14, 35, 26, -1, -1]},
  {"Taxon": "Spanish", "Segments": [14, 24, 26, -1, -1]},
  {"Taxon": "Italian", "Segments": [14, 24, 26, 0, -1]},
  {"Taxon": "PortugueseBrazil", "Segments": [14, 24, 8, -1, -1]},
  {"Taxon": "Portuguese", "Segments": [14, 24, 26, -1, -1]},
  {"Taxon": "Catalan", "Segments": [14, 24, 26, -1, -1]},
  {"Taxon": "Walloon", "Segments": [14, 0, -1, -1, -1]},
  {"Taxon": "Friulian", "Segments": [14, 27, 26, -1, -1]},
  {"Taxon": "Romanian", "Segments": [14, 24, 50, 0, -1]}
}},
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  {"Taxon": "French", "Segments": [40, -1, 0, -1, 52, -1]},
  {"Taxon": "Spanish", "Segments": [40, 12, 0, -1, 50, 24]},
  {"Taxon": "Italian", "Segments": [40, -1, 35, 50, 50, 24]},
  {"Taxon": "PortugueseBrazil", "Segments": [40, -1, 0, -1, 52, 25]},
  {"Taxon": "Portuguese", "Segments": [40, -1, 35, -1, 52, 25]},
  {"Taxon": "Catalan", "Segments": [40, -1, 35, -1, 50, 4]},
  {"Taxon": "Walloon", "Segments": [40, -1, 36, -1, 52, -1]},
  {"Taxon": "Friulian", "Segments": [40, 12, 35, -1, 50, 0]},
  {"Taxon": "Romanian", "Segments": [77, -1, 24, -1, 50, 4]}
}},
{"Name": "Sky", "Data": [
  {"Taxon": "Latin", "Segments": [20, -1, 49, 26, 15, 21]},
  {"Taxon": "French", "Segments": [14, 12, 35, 26, -1, -1]},
  {"Taxon": "Spanish", "Segments": [57, 12, 0, 26, 6, -1]},
  {"Taxon": "Italian", "Segments": [37, -1, 35, 26, 6, -1]},
  {"Taxon": "PortugueseBrazil", "Segments": [14, -1, 35, 8, -1, -1]},
  {"Taxon": "Portuguese", "Segments": [14, -1, 35, 8, -1, -1]},
  {"Taxon": "Catalan", "Segments": [14, -1, 35, 26, -1, -1]},
  {"Taxon": "Walloon", "Segments": [14, -1, 23, 52, -1, -1]},
  {"Taxon": "Friulian", "Segments": [37, -1, 23, 26, -1, -1]},
  {"Taxon": "Romanian", "Segments": [37, -1, 0, 54, -1, -1]}
}},
{"Name": "Wind", "Data": [
  {"Taxon": "Latin", "Segments": [8, -1, 0, 13, 40, 15, 21]},
  {"Taxon": "French", "Segments": [18, -1, 64, -1, -1, -1, -1]},
  {"Taxon": "Spanish", "Segments": [19, 12, 0, 13, 40, 6, -1]},
  {"Taxon": "Italian", "Segments": [18, -1, 35, 13, 40, 6, -1]},
  {"Taxon": "PortugueseBrazil", "Segments": [18, -1, 56, -1, 40, 15, -1]},
  {"Taxon": "Portuguese", "Segments": [18, -1, 56, -1, 40, 15, -1]},
  {"Taxon": "Catalan", "Segments": [19, -1, 0, 13, -1, -1, -1]},
  {"Taxon": "Walloon", "Segments": [18, -1, 56, -1, -1, -1, -1]},
  {"Taxon": "Friulian", "Segments": [18, -1, 7, 13, 40, -1, -1]},
  {"Taxon": "Romanian", "Segments": [18, -1, 34, 13, 40, -1, -1]}
}},
{"Name": "Fire", "Data": [
```

Appendix 1 - Indelly Configuration

```
{
  "Taxon": "Latin", "Segments": [80, -1, 6, 20, 15, 21]},
  {"Taxon": "French", "Segments": [80, -1, 47, -1, -1, -1]},
  {"Taxon": "Spanish", "Segments": [80, 8, 0, 1, 6, -1]},
  {"Taxon": "Italian", "Segments": [80, 8, 9, 20, 6, -1]},
  {"Taxon": "PortugueseBrazil", "Segments": [80, -1, 6, 1, 15, -1]},
  {"Taxon": "Portuguese", "Segments": [80, -1, 6, 62, 15, -1]},
  {"Taxon": "Catalan", "Segments": [80, -1, 9, 20, -1, -1]},
  {"Taxon": "Walloon", "Segments": [80, -1, 48, -1, -1, -1]},
  {"Taxon": "Friulian", "Segments": [80, -1, 42, 20, -1, -1]},
  {"Taxon": "Romanian", "Segments": [80, -1, 6, 20, -1, -1]}
}],
{"Name": "Green", "Data": [
  {"Taxon": "Latin", "Segments": [8, 7, 50, 7, 33, 0, 21]},
  {"Taxon": "French", "Segments": [18, 0, 52, -1, -1, -1, -1]},
  {"Taxon": "Spanish", "Segments": [19, 0, 54, -1, 33, 0, -1]},
  {"Taxon": "Italian", "Segments": [18, 0, 50, -1, 33, 0, -1]},
  {"Taxon": "PortugueseBrazil", "Segments": [18, 0, 54, -1, 33, 34, -1]},
  {"Taxon": "Portuguese", "Segments": [18, 0, 54, -1, 33, 34, -1]},
  {"Taxon": "Catalan", "Segments": [18, 35, 54, -1, 40, -1, -1]},
  {"Taxon": "Walloon", "Segments": [18, 35, 52, -1, -1, -1, -1]},
  {"Taxon": "Friulian", "Segments": [18, 35, 50, -1, 40, -1, -1]},
  {"Taxon": "Romanian", "Segments": [18, 0, 54, -1, 33, 0, -1]}
]},
{"Name": "Year", "Data": [
  {"Taxon": "Latin", "Segments": [24, 13, 13, 15, 21]},
  {"Taxon": "French", "Segments": [64, -1, -1, -1, -1]},
  {"Taxon": "Spanish", "Segments": [24, -1, 60, 6, -1]},
  {"Taxon": "Italian", "Segments": [24, 13, 13, 6, -1]},
  {"Taxon": "PortugueseBrazil", "Segments": [25, -1, 13, 15, -1]},
  {"Taxon": "Portuguese", "Segments": [25, -1, 13, 15, -1]},
  {"Taxon": "Catalan", "Segments": [24, -1, 60, -1, -1]},
  {"Taxon": "Walloon", "Segments": [38, -1, -1, -1, -1]},
  {"Taxon": "Friulian", "Segments": [24, -1, 46, -1, -1]},
  {"Taxon": "Romanian", "Segments": [24, 13, -1, -1, -1]}
]},
{"Name": "Name", "Data": [
  {"Taxon": "Latin", "Segments": [13, 2, 21, 0, 13]},
  {"Taxon": "French", "Segments": [13, 61, -1, -1, -1]},
  {"Taxon": "Italian", "Segments": [13, 2, 21, 0, -1]},
  {"Taxon": "PortugueseBrazil", "Segments": [13, 6, 21, 7, -1]},
  {"Taxon": "Portuguese", "Segments": [13, 6, 21, 34, -1]},
  {"Taxon": "Catalan", "Segments": [13, 9, 21, -1, -1]},
  {"Taxon": "Walloon", "Segments": [13, 45, -1, -1, -1]},
  {"Taxon": "Friulian", "Segments": [13, 9, 46, -1, -1]},
  {"Taxon": "Romanian", "Segments": [13, 15, 21, 0, -1]}
]},
{"Name": "Name", "Data": [
  {"Taxon": "Latin", "Segments": [13, 2, 21, 7, 13, -1, 0, 21]},
  {"Taxon": "Spanish", "Segments": [13, 6, 21, -1, 19, 54, 0, -1]}
]},
{"Name": "Tongue", "Data": [
```

Appendix 1 - Indelly Configuration

```
{
  "Taxon": "Latin", "Segments": [26, 7, 13, 81, -1, 24]},
  "Taxon": "French", "Segments": [26, 64, -1, 1, -1, -1]},
  "Taxon": "Spanish", "Segments": [26, 0, 46, 1, 8, 24]},
  "Taxon": "Italian", "Segments": [26, 7, 13, 1, 8, 24]},
  "Taxon": "PortugueseBrazil", "Segments": [26, 58, -1, 1, 8, 25]},
  "Taxon": "Portuguese", "Segments": [26, 58, -1, 1, 8, 25]},
  "Taxon": "Walloon", "Segments": [26, 82, -1, -1, -1, -1]},
  "Taxon": "Friulian", "Segments": [26, 35, 13, 59, -1, 35]},
  "Taxon": "Romanian", "Segments": [26, 7, 21, 19, -1, 4]}
}]
]
```


Appendix 2 - RevBayes Source File

```
#####
# RevBayes Source File for Linguistomics Project #
#####
clear()
path = "C:/Users/shawn/Documents/Code/Linguistomics/Run/Run1/"
gammapath = path+"Gamma.trees"

# Read in discrete character data
data = readDiscreteCharacterData(path+"Characters.nex")

# Get some useful variables from the data. We need these later on
num_taxa <- data.n taxa()

# Number of branches in an rooted tree
num_branches <- 2 * num_taxa - 2
taxa <- data.t taxa()

# Create helper variables
moves = VectorMoves()
monitors = VectorMonitors()

#####
# Tree Model #
#####

# Outgroup is a clade consisting of one language
out_group = clade("Latin")

# Prior distribution on the tree topology
topology ~ dnUniformTopology(taxa, outgroup=out_group, rooted=TRUE)

# These are moves that change the tree topology
moves.append(mvNNI(topology, weight=num_taxa/2.0))
moves.append(mvSPR(topology, weight=num_taxa/10.0))

# Branch length prior
for (i in 1:num_branches) {
  bl[i] ~ dnExponential(10.0)
  moves.append(mvScale(bl[i]))
}

TL := sum(bl)

psi := treeAssembly(topology, bl)
```

Appendix 2 - RevBayes Source File

```
#####
# Substitution Model #
#####

# This is the number of unique characters from the segment filters
unique_chars = 83

# Jukes-Cantor model
Q <- fnJC(unique_chars)

#####
# Gamma model for among-site variation #
#####
alpha ~ dnUniform(0, 10.0)
moves.append(mvScale(alpha, weight=1))
site_rates := fnDiscretizeGamma(alpha, alpha, 4)

#####
# PhyloCTMC Model #
#####
seq ~ dnPhyloCTMC(tree=psi, Q=Q, type="Standard", siteRates=site_rates)
seq.clamp(data)

#####
# Analysis #
#####

# You can use any node as the argument of model()
mymodel = model(psi)
n_gen = 10

# This prints monitors to the screen
monitors.append(mnScreen(TL, printgen=n_gen))

# This monitors the trees and puts them in a file
monitors.append(mnFile(psi, filename=gammapath, printgen=n_gen))

# Model monitor
monitors.append(mnModel(filename=path+"Gamma.log", printgen=n_gen))
mymcmc = mcmc(mymodel, moves, monitors, nruns=1, combine="mixed")
mymcmc.run(generations=1000)

# Summarizes the MCMC runs
mymcmc.operatorSummary()

#####
# Post processing #
```

Appendix 2 - RevBayes Source File

```
#####  
treetrace      = readTreeTrace(gammapath, outgroup=out_group)  
map_tree       = mapTree(treetrace, path+"Gamma_MAP.tree")  
mcc_tree       = mccTree(treetrace, path+"Gamma_MCC.tree")  
consensus_tree = consensusTree(treetrace, path+"Gamma_Consensus.tree")  
  
# Exit the program  
q()
```

Appendix 3 - Segments used in the word list

Char.	Segment	Words containing this segment
0	e	ego:, ew, jew, ekkumhi:k, k ^w em, kjen, ʃine, ke, ʃe, kome, ʃemut, due, tres, tr e, tref, k ^w i:nk ^w e, ʃiŋkwe, grandem, grande, grande, majjorem, mare, le, piske m, peθ, peʃʃe, peʃ, peʃte, awem, abe, awikellum, useɿ, passerem, passero, pas ære, bibere, beber, bere, bebeɿ, biʃer, bevi, komedere, komer, kome, kumer, m anduka:re, mǎʒe, mandʒa:re, morde:re, morðer, mǎrdere, moɿdeɿ, murðer, mo rsika:re, morsikare, murseka, su:gere, syse, suðʒe, konspuere, kǎspy e, eskupir, sputere, esputar, sputa:re, ski:re, sapere, saber, sape:re, sabeɿ, seber, kogno:sk ere, konoθer, konoffere, koɿeseɿ, kuɿiser, kuɿaʃte, ko:gitare, kuɿide, koðʒit a:re, kuðʒeta, pe:nsa:re, pǎse, pensar, pensa:re, pǎse, peɿsa:, time:re, temer, te me:re, temɿ, timer, temǎ, temi, teme, tremere, tremer, trema:re, tremɿ, trim er, dormire, wi:were, vi:vere, viveɿ, viver, mori:re, moɿeɿ, muɿer, nata:re, n wota:re, naviga:re, naze, nabegar, navigare, wola:re, vole, vola:re, vǎle, zvola: re, wen:re, benir, veni:re, veni, kadere, kaer, kade:re, ʃjade, tǎbe, tume, kant a:re, ʃǎte, ʃǎte, lu:dere, joka:re, zwe, dʒoka:re, dʒuwe, gela:re, zǎle, elar, dʒelare, dʒale, glakia:re, glase, gʒatʃjare, inglakia:re, ingetsa, so:lem, sole, sǎare, soreli, lune, etwal, estreja, stella, istrelǎ, iʃtrelǎ, stele, age, ploje, ploaje, mare, meɿ, sa:lem, sale, se, sare, terra, teɿ, tjera, teɿ, tjere, θjelo, ʃer, wentum, bjento, b en, fwego, wiridem, veɿ, berde, verde, verdi, verde, no:men, no:me, nume, n o:minem, nombre, leɿgwa
1	g	ego:, gǎ, grande, grande, grǎʒi, grǎdi, longum, lungo, lǎgu, largo, laɿgu, laɿg u, musǎga, musǎgar, su:gere, sugaɿ, sugar, kogno:skere, ko:gitare, nabegar, n avigare, nǎbǎga, naviga, zogaa, zuga, gela:re, glakia:re, glase, gʒatʃjare, glǎsa, inglakia:re, agwǎ, lago, lagu, fwego, fogu, lǎg, leɿgwa, lingwa, liɿgwǎ
2	o:	ego:, no:s, no:i, no:, wo:s, vo:i, vo:, k ^w ando:, k ^w o:modo, duo:s, kogno:skere, ko:g ita:re, so:lem, no:men, no:me, no:minem
3	ʒ	ʒǎ, ʒǎ, laɿʒ, mǎʒe, mǎʒaa, mǎʒar, mǎɿʒa, kuʒitaɿ, kuʒitar, naze, zwe, zogaa, ʒ uɿar, zuga, zuka, zǎle, ʒilar, ʒǎla, pluʒǎ
4	ǎ	ʒǎ, ǎla, dowǎ, amplǎ, pasǎre, beɿwǎ, mǎɿʒa, musǎga, musǎgar, musǎɿa, ǎskup i, sǎʒe, kuɿǎʃ, pǎnsa, pǎsa, temǎ, biwǎ, nǎda, nǎbǎga, vǎniɿ, bǎni, kawǎ, kǎ dǎa, kǎnta, zǎle, ʒǎla, glǎsa, ɿunǎ, lunǎ, ǎstel, ǎɿwǎ, ǎpǎ, pluʒǎ, teɿǎ, tsarǎ, li mbǎ
5	j	jo, aja, estreja, jubja
6	o	jo, io, jo, nos, no, bos, vof, vos, kwando, k ^w o:modo, komo, kome, komu, uno, dos, dowǎ, θinko, maɿo, maɿno, majjorem, longum, longo, lungo, ɿoɿ, laɿɿo, largo, lato, anʃo, ampjo, wazo, utʃello, paxaro, passero, komedere, komer, k ome, morde:re, moɿdeɿ, morðer, moɿdeɿ, morsika:re, moskar, morsikare, kons puere, kogno:skere, konoθer, konoffere, koɿeseɿ, koɿosi, koðʒita:re, dormire, dormir, doɿmiɿ, dormi, mori:, morir, mori:re, moɿeɿ, nwota:re, wola:re, vole, bolar, vola:re, voaa, zvola:re, zvola, joka:re, dʒoka:re, zogaa, sol, sole, soliculus, soreli, o, pʒodʒa, ploje, lago, lago, θjelo, ʃelo, bjento, vento, fokum, fwego, f woko, fogu, foɿu, fok, ǎno, anno, nomi, nomi, nombre

Appendix 3 - Segments used in the word list

7	i	io, no:i, vo:i, isi, aki, kwi, eki, illa:k, ibi:, vi, ai, ei, k ^w is, ki, kwi, f ⁱ ine, k ^w id, 0i nko, f ⁱ inkwe, siŋk, f ⁱ ink, f ⁱ int ^f , grēdži, piskem, pejfi, avi, awikellum, bibere, be vi, morsika:re, morsikare, kuspiɤ, kuspɪr, eskupiɪ, əskupi, fti, kinɔh, koposi, ko:gita:re, kɥide, kwidar, kodžita:re, kuzitaɤ, kuzitar, time:re, temi, trima:, do ɤmiɤ, dormir, doɤmiɤ, durmir, durmi, dwaɤmi, dormi, vivɤ, bibir, viveɤ, vive r, biwɪrə, vivi, via, muɤiɤ, morir, muri, mɔri, muri, naviga:re, navigare, navig a, naviga, vənɪɤ, benir, viɤ, vir, bəni, vini, vɪni:, veni, keir, ludir, glakia:re, in glakia:re, solculus, soreli, istrelə, pluwia, plɥi, vint, wiridem, nomi, no:min em, ling ^w a, lingwa, limbə
8	w	ew, jew, wo:s, kwi, kwi, kwa, kwɛ:, kwando, kwēdu, kwan, kwand, kwant, d owə, tɤwə, f ⁱ inkwe, pwasō, awem, aw, awikellum, wazo, bwɤɤ, bɛwɪrə, savw aɤ, kwidar, dwaɤmi, wi:were, biwɪrə, nwota:re, wola:re, vwar, wenire, fwaɤ, kawɪrə, ʒwe, dʒuwe, sɔw, etwal, aywa, akkwa, agwɛ, ajɥwə, ɛ:w, pluwia, saw, sɛw, wentum, fwego, fwoko, wiridem, lɛŋgwa, lingwa, liɣwe
9	ɔ	ʒə, nɔjs, nɔf, vɔjs, kɔm, kɔmɛ, mɔrdere, kɔnetɤ, kinɔh, dɔɤmiɤ, mɔri, vɔle, sɔw, sɔt, sɔl, sɔlɔ, sɔlej, fwoko, fɔk, nɔm, nɔŋ
10	dʒ	dʒi, grēdži, mandža:re, sudʒe, kodžita:re, kudžeta, nɛdʒi:, dʒoka:re, dʒuwe, dʒuja, dʒ elare, dʒale, pjoddʒa
11	ɪ	dʒɪ
12	j	jo, jew, nɔjs, vɔjs, kjen, majjorem, ampjo, utʃjel, skujpa, kujda, tʃjade, joka:re, dʒuja, gʒatʃjare, jubja, pjoddʒa, ploje, plɔaje, tjera, tjere, sjel, 0jelo, bjento
13	n	no:s, nu, nos, no:i, nɔjs, nɔf, no, no:, noj, kjen, f ⁱ ine, k ^w ando:, kwando, kwan, kwand, kwant, kind, u:num, uno, un, unu, k ^w i:nk ^w e, 0inko, f ⁱ int ^f , magnum, g randem, grande, grande, gran, grant, longum, longo, lungo, lunk, lung, antʃo, manduka:re, mandukar, mandža:re, minka, konspuere, kogno:skere, kɔnetɤ, k ono0er, konoffere, kunɛfə, kinɔh, kunɔafte, pe:nsa:re, pensar, pensa:re, pənsa, nata:re, nadar, nwota:re, nadaɤ, nɛðar, nəda, nada, naviga:re, naze, nabegar, navigare, navɪyɤ, nɛvɪyɤ, nəbəga, nɛdʒi:, naviga, naviga, wenire, vənɪɤ, be nir, venire, bəni, vini, veni, kanta:re, kantar, kənta, canta:, kinta, inglakia:re, ingetsa, lu:na, lyn, luna, ʌunə, lɔn, lune, lunə, wentum, bjento, vento, ben, vi nt, vint, annum, anno, ɛnu, an, no:men, nō, no:me, nomi, nomi, nɔm, nō, nɔŋ, nume, no:minem, nombre, ling ^w a, lingwa, lɛŋgɛ
14	s	no:s, nos, nɔjs, wo:s, bos, vɔjs, bus, vos, isi, k ^w is, duo:s, dos, dojs, duas, dues, t re:s, tres, trɛs, sēk, siku, siŋk, piskem, pɛs, pwasō, useɹ, passerem, passero, pa sɛru, pasəre, morsika:re, moskar, morsikare, musəga, musəgar, musəɣa, murs eka, su:gere, syse, sugaɤ, sugar, sysi:, sudʒe, konspuere, kɔspye, kuspiɤ, eskupi r, əskupi, skujpa, sputere, esputar, sputa:re, ski:re, sapere, savwaɤ, saber, sap e:re, sabɛɤ, səber, səβɛ, savɔ:r, save:, kogno:skere, kopeseɤ, kupiser, koposi, p e:nsa:re, pāse, pensar, pensa:re, pɛsaɤ, pɛsar, pənsa, pɛse, peɣsa:, pəsa, glase, g ləsa, so:lem, sol, sole, sɔw, sɔt, sɔl, sɔlɔ, sqare, solculus, sɔlej, soreli, ste:lla, es treja, stella, istrelə, əstɛl, stɔ:l, stele, stɛa, sa:lem, sɛl, sal, sale, saw, se, sa:l, sar e, sjel, sɛw, sɛl, si:ɤ

Appendix 3 - Segments used in the word list

15	u	nu, vu, bus, ekkumhi:k, kwēdu, komu, kum, u:num, uno, un, uŋ, unu, duo:s, duaj, due, duas, duēs, duēf, sīku, magnum, longum, lungu, lōgu, lunk, lung, l argum, laŋgu, largu, la:tum, latu, amplum, ēfu, awikellum, uttfello, useł, utfje l, paseru, kumer, manduka:re, mandukar, murðer, musəga, musəgar, musəya, murseka, sugaŋ, sugar, suðe, konspuere, kuspik, kufpir, eskupir, əskupi, sku jpa, sputere, esputar, sputa:re, kuŋiser, kuŋefə, kuŋašte, kuzitaŋ, kuzitar, ku jda, kuðgeta, durmir, durmi, durmit, muŋik, muŋer, muri, muri:, muri, bula, z bura, tumber, tumba, tume, ludir, xugar, zuyar, zuga, dzuwe, dzuja, zuka, soli culus, luna, lue, łunə, lune, lunə, pluwia, jubja, fuve, pluza, lakum, lagu, lay u, kajlum, wentum, vētu, fokum, fogu, foyu, annum, enu, nume
16	f	nəf, vof, dojf, duēf, tref, ēfu, peffe, pejfi, pejfi, pef, pešte, kufpir, fti, konoffe re, kuŋefə, kuŋašte, fwaŋ, fāte, iftrele, fuve
17	oj	noj, voj, dojs, dojf, doj
18	v	vu, voi, vōjs, vof, vos, vo:, voj, vi, avi, avi, bevi, savwaŋ, savø:r, save:, vivŋ, v i:vere, viveŋ, viver, vivi, via, naviga:re, navigare, naviyaŋ, naviyar, naviga, naviga, vole, vola:re, voaŋ, vwar, vōle, zvola:re, zvola, vənik, veni:re, viŋ, vir, vini, vipi:, veni, fuve, vā, vento, vētu, vē, vint, vint, veŋ, verde, verdi, vert, v eŋ, vert, verde
19	b	bos, bus, ibi:, abe, bibere, bwaŋ, beber, bere, bebeŋ, biŋer, bəwrə, bə:ŋ, bevi, bəa, saber, sabeŋ, seber, bibir, biwrə, nabegar, nəbəga, bolar, bula, zbura, benir, bə ni, tōbe, tumber, tōbaŋ, tōbar, tumba, jubja, bjento, ben, berde, nombre, limbə
20	k	ekumhi:k, aki, kwi, eki, illa:k, ki, ki:, kwi, kjen, kēj, kēj, kwa, ke, ki, kē, kwe:, kā, kwando, kwēdu, kwan, kwand, kwant, kind, kōm, komo, kome, komu, k ɔmē, kum, sēk, θinko, fɪŋkwe, sīku, siŋk, fɪŋk, lunk, ɬark, lark, piskem, awik ellum, komedere, komer, kome, kumer, manduka:re, mandukar, minka, mors ika:re, moskar, morsikare, murseka, konspuere, kōspye, kuspik, kufpir, eskup ir, əskupi, skujpa, ski:re, kogno:skere, kōnetŋ, konoθer, konoffere, kōnesek, k uŋiser, kuŋefə, kinɔh, kōnosi, kuŋašte, ko:gita:re, kɔide, kwidar, koðgita:re, kuzitaŋ, kuzitar, kujda, kuðgeta, kēdɔ, kadere, kaer, kade:re, kēir, kawrə, kə dɛa, kanta:re, kantar, kētar, kənta, kinta, joka:re, dʒoka:re, zuka, glakia:re, ing lakia:re, akkwa, lakum, lak, ɬak, kajlum, fokum, fwoko, fɔk, fu:k, fok
21	m	ekumhi:k, k ^w em, k ^w o:modo, kōm, komo, kome, komu, kōmē, fɛmu:t, kum, u: num, magnum, mapo, majpo, grandem, majjorem, mare, longum, largum, la: tum, amplum, ampjo, amplə, piskem, awem, awikellum, passerem, komedere, komer, kome, kumer, manduka:re, māze, mandukar, mandɟa:re, mēzaŋ, mēzar, mərza, məri:, maŋja, minka, morde:re, moɔdɔ, morðer, mōrdere, moɔdeŋ, mu rðer, morsika:re, moskar, morsikare, musəga, musəgar, musəya, murseka, ti mere, temer, teme:re, temek, timer, temə, temi, teme, tremere, tremar, trema: re, tremek, trimer, trima:, dormi:re, dɔɔmiŋ, dormir, dɔɔmiŋ, durmir, durmi, dwaɔmi, durmi:, dormi, mori:, muŋik, morir, mori:re, moɔek, muŋer, muri, m ɔri, muri:, muri, tumber, tumba, tume, so:lem, lakum, mare, meŋ, mar, maŋ, mar, meŋ, ma:r, sa:lem, kajlum, wentum, fokum, wiridem, annum, no:men, n o:me, nomi, nomi, nōm, nume, no:minem, nombre, limbə
22	h	ekumhi:k, pēhō, u:hē:, kinɔh
23	i:	ekumhi:k, ibi:, ki:, k ^w i:nk ^w e, məri:, sysi:, ski:re, dormi:re, durmi:, wi:were, vi: vere, mori:, mori:re, muri:, nɛɟi:, weni:re, veni:re, vipi:, si:ŋ, fɪ:l

Appendix 3 - Segments used in the word list

24	a	aki, la, aja, ə́la, ai, kwa, k ^w ando:, kwando, kwan, kwand, kwant, duas, magn um, maño, maño, grandem, grande, grande, gran, grant, mare, largum, laꝛz, lar̃yo, largo, laꝛgu, largu, laꝛk, lark, larg, lato, latu, lat, amplum, anſo, ampj o, amplə, pwasō, awem, abe, avi, avi, aw, awikellum, wazo, passerem, paxaro, passero, paseru, pasere, manduka:re, mandukar, mandɕa:re, mḗzaꝛ, mḗzar, m əꝛza, maɲi:, maɲja, minka, moskar, morsikare, musəga, musəgar, musəya, m urseka, sugaꝛ, sugar, skujpa, esputar, sapere, savwaꝛ, saber, sape:re, sabek, s avø:r, save:, kwidar, kuɰitaꝛ, kuɰitar, kujda, kuɕeta, pensar, pēsak, pēsar, pə nsa, pəsa, dwaꝛmi, via, nata:re, nadar, nadaꝛ, nəðar, nəda, nada, navigare, n aze, nabegar, navigare, naviyaꝛ, nəviyaꝛ, nəbəga, naviga, naviga, bolar, voak, vwar, bula, zvola, zbuɾa, kadere, ʃwaꝛ, kaer, kade:re, kawrə, ʃjade, tumbaɾ, t ōbaꝛ, tōbaɾ, tumba, kanta:re, kantar, kḗtaɾ, kə́nta, canta:, kinta, xugar, zogak, zuɣar, zuga, ɕuja, zuka, elar, ɕelare, zilar, zə́la, ɕale, glakia:re, glase, gjaɕja re, gləsa, glaɕa, inglakia:re, ingetsa, lu:na, luna, ste:lla, etwal, estreja, stella, ak ^w a, aɣwa, akkwa, agwə, age, apə, pluwia, jubja, pjodɕa, lakum, lak, lago, l ago, lagu, laɣu, laꝛk, mare, mar, maꝛ, mar, sal, sale, saw, sare, terra, tjera, te ra, tsarə, annum, apo, anno, ap, aɲ, an, ling ^w a, lenggwa, lingwa
25	ɐ	eki, ei, duəs, duɐʃ, paseru, seber, nəðar, nəviyaꝛ, keir, lue, istrele, iftrele, ag wə, ʃuvə, teꝛə, teꝛə, ɐnu, ligwə
26	l	illa:k, la, longum, lō, longo, lungu, lōgu, lō, lunk, lung, largum, laꝛz, lar̃yo, la rgo, laꝛgu, largu, lark, larg, la:tum, le, lato, latu, lat, amplum, āpl, amplə, aw ikellum, utʃello, utʃjel, wola:re, vole, bolar, vola:re, bula, vōle, zvola:re, zvola, lu:dere, ludir, gela:re, zə́le, elar, ɕelare, zilar, zə́la, ɕale, glakia:re, glase, gləsa, glaɕa, inglakia:re, so:lem, sol, sole, səl, səl, solculus, söləj, soreli, lu:na, lyn, luna, lue, lən, lune, lunə, ste:lla, etwal, stella, istrele, iftrele, ə́stəl, stə:l, stele, pluwia, plqi, pluzə, pluꝛ, ploje, pləje, lakum, lak, lago, lago, lagu, laɣu, la:t, sa:lem, səl, sal, sale, sa:l, kajlum, sjel, ʰjelo, ʃə́lo, səl, ʃi:l, ling ^w a, lāḡ, lenggwa, l ingwa, ligwə, lḗu, lə́nge, limbə
27	a:	illa:k, la:tum, manduka:re, mandɕa:re, morsika:re, sputa:re, ko:gitare, koɕita: re, pe:nsa:re, pensa:re, peɲsa:, trema:re, trima:, nata:re, nwota:re, navigare, wo lare, vola:re, zvola:re, kanta:re, canta:, joka:re, ɕoka:re, gela:re, glakia:re, ingl akia:re, la:t, ma:r, sa:lem, sa:l
28	ʌ	ə́la, laɲ, laꝛk, useʌ, lunə, laꝛk
29	k ^w	k ^w is, k ^w em, k ^w id, k ^w ando:, k ^w o:modo, k ^w i:nk ^w e, ak ^w a
30	ḗj	kḗj
31	ḗj	kḗj
32	ʃj	ʃjine, ʃjemu:t
33	d	k ^w id, k ^w ando:, kwando, kwḗdu, kwand, kind, k ^w o:modo, duo:s, dø, dos, dojs, dojʃ, dø:, doj, duaj, due, dowə, duas, duəs, duɐʃ, grandem, grande, grande, grḗ di, komedere, manduka:re, mandukar, morde:re, moꝛdɐ, moꝛdere, moꝛdeꝛ, k uɰide, kwidar, kujda, kḗdɐ, dormi:re, doꝛmiꝛ, dormir, doꝛmiꝛ, durmir, durmi, dwaꝛmi, durmi:, dormi, nadar, nadaꝛ, nəda, nada, kadere, kade:re, ʃjade, kə ɕə, lu:dere, ludir, pjodɕa, wiridem, berde, verde, verdi, verde
34	i	ki, kind, grḗdi, peɲʃi, avi, biɐer, minka, kuɲiser, timer, trimer, naviyaꝛ, nəvi yaꝛ, kinta, zilar, ingetsa, iftrele, vint, verdi, nomi

Appendix 3 - Segments used in the word list

35	ε	kε, trεs, pεs, pεhō, utʃεllo, utʃjel, bεwɾə, səβε, kɔnεtɤ, kunεʃə, nεdʒi:, əstɛl, stɛle, mεɤ, sɛl, tɛrra, tɛɤ, tɛrə, tʃɛrɛ, sjɛl, ʃɛlo, sɛw, sɛl, vɛnto, vɛrt, vɛɤ, vɛrt, lɛngɛ
36	ε:	kwε:, u:hε:, ʃɛ:ɾ, ε:w, tɛ:ɤ
37	ʃ	ʃɛ, ʃɪŋkwe, ʃɪŋk, ʃɪnʃ, anʃo, utʃεllo, utʃjel, ʃɛ:ɾ, ʃjɛdɛ, ʃãtɛ, gʃatʃjɛrɛ, glɛʃa, ʃɛlo, ʃi:l, ʃɛɾ
38	ã	kã, gɤã, gɤã, ʃãtɛ, ã
39	ẽ	kwẽdu, grẽdʒi, grẽdi, ẽʃu, mẽʒɤ, mẽʒɛɾ, kẽtɛɾ
40	t	kwant, ʃɛmɯt, trɛ:s, tɾwɔ, trɛs, trɛ, tɾɛʃ, trɛs, tɾɔ:, trɛ:, trɛj, grant, la:tum, lat o, latu, lat, pɛʃtɛ, utʃεllo, sputɛrɛ, esputɛɾ, sputa:rɛ, ʃti, kɔnɛtɤ, kunɔɤʃtɛ, ko:gita:rɛ, koʒita:rɛ, kuzitaɤ, kuzitaɾ, kuʒɛtɛ, time:rɛ, temɛɾ, temɛ:rɛ, temɛɤ, ti mɛɾ, temə, temi, temɛ, tremɛrɛ, tremɛɾ, trema:rɛ, tremɛɤ, trimer, trima:, nata:rɛ, nwota:rɛ, tōbɛ, tumbɛɾ, tōbɤ, tōbɛɾ, tumba, tume, kanta:rɛ, ʃdɛ, kantaɾ, kẽtɛɾ, kɔntɛ, ʃãtɛ, canta:, kinta, gʃatʃjɛrɛ, stɛ:lla, etwal, estɾɛja, stɛlla, istɾɛlɛ, ɪʃtɾɛlɛ, əstɛl, stɔ:l, stɛle, stɛɛ, la:t, tɛrra, tɛɤ, tʃɛrɛ, tɛrra, tɛɤ, tɛɤ, tɛrə, tɛ:ɤ, tʃ ɛrɛ, wentum, bjɛnto, vɛnto, vɛtu, vint, vint, vɛrt, vɛrt
41	ẽ	kɔmẽ, pɛsɛ
42	u:	ʃɛmɯt, u:ɲum, u:hɛ:, su:gɛrɛ, lu:dɛrɛ, lu:na, plu:ɤ, fu:k
43	œ	œ
44	ũ	ũ
45	ō	ō, lōgu, lō, pwasō, pɛhō, tōbɛ, tōbɤ, tōbɛɾ, nō
46	ŋ	uŋ, ʃɪŋkwe, siŋk, ʃɪŋk, ɔŋ, maŋʃa, pɛŋsa:, aŋ, nɔŋ, lɛŋgwa
47	ø	dø, lɔn, fø
48	ø:	dø:, tɾɔ:, bø:ɤ, savø:ɾ, stø:l, fø:
49	aj	duaɪ, majjɔrɛm, ajɥwə, kajlum
50	r	trɛ:s, trɛ, trɛs, tɾɔ:, trɛ:, trɛj, grandɛm, grande, gran, grant, majjɔrɛm, largum, largo, lark, larg, passerɛm, passɛrɔ, bibɛrɛ, komɛdɛrɛ, manduka:rɛ, morɛ:rɛ, mɔrdɛrɛ, morsika:rɛ, morsikaɾ, musɛgar, murɛka, su:gɛrɛ, konspuɛrɛ, sputɛ rɛ, ski:rɛ, sapɛrɛ, sapɛ:rɛ, kogno:skɛrɛ, konɔʃfɛrɛ, ko:gita:rɛ, koʒita:rɛ, pɛ:nsa: rɛ, time:rɛ, temɛ:rɛ, tremɛrɛ, trema:rɛ, trima:, dormi:rɛ, durmi, durmi:, dormi, wi:wɛrɛ, vi:vɛrɛ, mori:, mori:rɛ, muri:, muri, nata:rɛ, naviga:rɛ, navigaɾ, wol a:rɛ, wɛni:rɛ, kadɛrɛ, kawɾə, kanta:rɛ, lu:dɛrɛ, jɔka:rɛ, ʒɔka:rɛ, gɛla:rɛ, ʒɛlaɾɛ, glakia:rɛ, gʃatʃjɛrɛ, inglakia:rɛ, soreli, mare, mar, ma:r, sare, tɛrra, tʃɛrɛ, tɛrra, tɛrə, tʃɛrɛ, tsarə, wiridɛm, vɛrdɛ, vɛrt
51	e:	trɛ:s, trɛ:, morɛ:rɛ, sapɛ:rɛ, savɛ:, pɛ:nsa:rɛ, time:rɛ, temɛ:rɛ, kadɛ:rɛ, stɛ:lla
52	ɤ	tɤwɔ, gɤã, gɤã, laɤʒ, laɤgu, bɤwɔ, bebɤ, bø:ɤ, mẽʒɤ, moɤɤ, moɤdɤ, sugɤ, kuspiɤ, savɤwɔ, sabɤ, kɔnɛtɤ, kopɛsɤ, kuzitaɤ, pɛsɤ, temɤ, kɛdɤ, tremɤ, dɔɤmiɤ, dɔɤmiɤ, dɤwɤmi, viɤɤ, viɤɤ, muɤɤ, moɤɤ, muɤɛɾ, nadɤ, naviɤɤ, voɤ, vɔniɤ, viɤ, ʃɤwɔ, tōbɤ, ʒɔgɤ, plu:ɤ, mɛɤ, maɤ, mɛɤ, tɛɤ, tɛɤ, tɛɤ, tɛ:ɤ, si:ɤ, vɛɤ, vɛɤ
53	ɔ	tɤwɔ, bɤwɔ

Appendix 3 - Segments used in the word list

54	r	tres, tref, grande, grēdʒi, grēdi, mare, laryo, largu, ʎark, paxaro, pasəru, pasər e, beber, bere, biβer, bəwrə, komer, kumer, mandukar, mandʒa:re, mēzar, mor ðer, murðer, moskar, morsikare, sugar, kufpir, eskupir, esputar, sputa:re, sabe r, səber, konoθer, kupiser, kwidar, kuzitar, pensar, pensa:re, pēsar, temer, tim er, tremer, tremex, trimer, dormir, durmir, bibir, viver, biwrə, morir, muβer, muri, nadar, nwota:re, nəðar, nabegar, nəviyar, bolar, vola:re, vwar, zvola:re, zbura, benir, veni:re, vir, kaer, kade:re, kəir, tumbat, tōbat, kantar, kētar, lud ir, xugar, zuyar, elar, zilar, sqare, estreja, istrelə, iʃtrelə, mar, ʃer, berde, verd i, vɛrt, verde, nombre
55	ej	trej, pejʃi
56	ē	sēk, pēsax, pēsar, kṽēdṽ, vētu, vē
57	θ	θinko, peθ, konoθer, θjelo
58	ī	sīku, līgwe
59	g	magnum, grandem, gran, grā, grant, longo, lung, largum, larg, naviga:re, na viga, xugar, glatʃa, ingetsa, age, lago, lənge
60	ɲ	maɲo, maɲno, mənza, maɲi:, kopesex, kupiser, koposi, vini:, apo, ap
61	ō	lō, kōspye, nō
62	ɣ	laryo, musəya, naviyax, nəviyar, zuyar, aywa, ajɣwə, layu, foyu
63	p	amplum, āpl, ampjo, amplə, piskem, peθ, peʃfe, pejʃi, pejʃi, peʃ, pəs, peʃte, pw asō, pēhō, passerem, paxaro, passero, pasəru, pasəre, konspuere, kōspye, kusp iɪ, kufpir, eskupir, əskupi, skujpa, sputere, esputar, sputa:re, sapere, sape:re, pe:nsa:re, pāse, pensar, pensa:re, pēsax, pēsar, pənsa, pēse, peɲsa:, pəsa, apə, p luwia, plqi, pjodʒa, pluza, plu:ɣ, ploje, pləje
64	ā	āpl, māze, pāse, ʃāte, vā, ā, lāg
65	ej	pejʃi
66	z	wazo, zvola:re, zvola, zbura
67	x	paxaro, xugar
68	β	biβer, səβe
69	ɛa	bɛa, kədəɛ, stɛa
70	ʃ	maɲʃa
71	ð	morðer, murðer, nəðar
72	y	syse, sysi:, kōspye, lyn
73	ɾ	savø:ɾ, mɔri, ʃɛ:ɾ
74	qa	kunqafte, sqare, pləje
75	q	kqide, plqi
76	c	canta:, solculus
77	ts	ingetsa, tsarə
78	ɬ	sɔɬ
79	ej	sɔləj
80	f	fokum, fə, fwego, fwəko, fogu, foyu, fɔk, fə:, fu:k, fok
81	g ^w	ling ^w a
82	ẽu	lẽu

Appendix 4 - Word Lists by Language

Latin

Ancestral Class	IPA	Sounds
I	-ego:	ay-g-O
We	no:-s	n-O-s
YouPlural	wo:-s	w-O-s
Here	-ekkumhi:k	ay-k-k-u-m-h-E-k
There	illa:k	e-l-l-A-k
There-Ibi	ibi:	e-b-E
Who-Qui	k ^w -is	kw-e-s
Who-Quem	k ^w -em-	kw-ay-m
What	'k ^w -id	kw-e-d
When-Quando	k ^w -ando:	kw-ah-n-d-O
How-Quomodo	'k ^w o:modo	kw-O-m-oh-d-oh
One	'u:num	U-n-u-m
Two-Duos	duo:s	d-u-O-s
Two-Duae	du-aj	d-u-aj_diphthong
Two-Duas	duas	d-u-ah-s
Three	tr-e:s	t-r-ai-s
Five	'k ^w i:nk ^w -e	kw-E-n-kw-ay
Big	magnum	m-ah-j-n-u-m
Big-Grandem	grandem	j-r-ah-n-d-ay-m
Big-Majjorem	majjorem	m-aj_diphthong-jg-oh-r-ay-m
Long-Longum	'lo-ngum	l-oh-n-g-u-m
Long-Largum	largum	l-ah-r-j-u-m
Wide	'la:tum	l-A-t-u-m
Wide-Amplum	amplum	ah-m-p-l-u-m
Fish-Piskem	piskem	p-e-s-k-ay-m
Bird-Avem	awem	ah-w-ay-m
Bird-Avicellum	-awi-k-ellum	ah-w-e-k-ay-l-l-u-m
Bird-Passerem	passerem	p-ah-s-s-ay-r-ay-m
ToDrink	'bib-ere	b-e-b-ay-r-ay
ToEat	komedere	k-oh-m-ay-d-ay-r-ay
ToEat-Manducare	manduka:re	m-ah-n-d-u-k-A-r-ay
ToBite	morde:re	m-oh-r-d-ai-r-ay
ToBite-Morsicare	morsika:re	m-oh-r-s-e-k-A-r-ay
ToSuck	su:gere	s-U-g-ay-r-ay
ToSpit	konspuere	k-oh-n-s-p-u-ay-r-ay
ToSpit-Sputare	-sputere	s-p-u-t-ay-r-ay
ToKnow	ski:re	s-k-E-r-ay
ToKnow-Sapere	sap-ere	s-ah-p-ay-r-ay

Appendix 4 - Word Lists by Language

ToKnow-Cognoscere	kogno:skere	k-oh-g-n-O-s-k-ay-r-ay
ToThink	k-o:gita:re	k-O-g-e-t-A-r-ay
ToThink-Pensare	pe:nsa:re	p-ai-n-s-A-r-ay
ToFear	time:re	t-e-m-ai-r-ay
ToFear-Tremere	trem-ere	t-r-ay-m-ay-r-ay
ToSleep	d-ormi:re	d-oh-r-m-E-r-ay
ToLive	wi:were	w-E-w-ay-r-ay
ToDie	mori:--	m-oh-r-E
ToSwim	n-ata:re	n-ah-t-A-r-ay
ToSwim-Navigare	naviga:re	n-ah-v-e-j-A-r-ay
ToFly	wola:re	w-oh-l-A-r-ay
ToCome	weni:re	w-ay-n-E-r-ay
ToFall	k-adere	k-ah-d-ay-r-ay
ToSing-AncestralClass	kanta:re	k-ah-n-t-A-r-ay
ToPlay-Ludere	lu:dere	l-U-d-ay-r-ay
ToPlay-Jiocare	jo-ka:re	jg-oh-k-A-r-ay
ToFreeze	gela:re	g-ay-l-A-r-ay
ToFreeze-Glaciare	gla-kia:re	g-l-ah-k-e-A-r-ay
ToFreeze-Inglaciare	inglakia:re	e-n-g-l-ah-k-e-A-r-ay
Sun	so:lem	s-O-l-ay-m
Sun-Soliculus	soliculus	s-oh-l-e-tya-u-l-u-s
Moon	lu:na	l-U-n-ah
Star	-st-e:lla	s-t-ai-l-l-ah
Water	a-k ^w -a	ah-kw-ah
Rain	plu-wia	p-l-u-w-e-ah
Lake	lakum	l-ah-k-u-m
Sea	mare	m-ah-r-ay
Salt	'sa:lem	s-A-l-ay-m
Earth	t-erra	t-ay-r-r-ah
Sky	'k-ajlum	k-aj_diphthong-l-u-m
Wind	w-entum	w-ay-n-t-u-m
Fire-Focus	f-okum	f-oh-k-u-m
Green	'wiridem	w-e-r-e-d-ay-m
Year	annum	ah-n-n-u-m
Name-Nomen	no:men	n-O-m-ay-n
Name-Nominem	no:min-em	n-O-m-e-n-ay-m
Tongue	ling ^w -a	l-e-n-gw-ah

French

Ancestral Class	IPA	Sounds
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Appendix 4 - Word Lists by Language

I	-ʒ-ə	gzah-aah
We	nu--	n-u
YouPlural	vu--	v-u
Here	i--s---i-	e-s-e
There	--la-	l-ah
Who-Qui	k-i-	k-e
What	kwa-	k-w-ah
When-Quando	k-ã---	k-an
How-Quomodo	kɔm---	k-euh-m
One	œ---	uuh
Two-Duos	d-ø-	d-uu
Three	tɤwa-	t-rr-w-a
Five	sē-k--	s-ehn-k
Big-Grandem	gɤã---	g-rr-an
Long-Longum	lɔ-----	l-oon
Long-Largum	laɤʒ--	l-ah-rr-gzah
Wide	le---	l-ay
Wide-Amplum	ã-pl--	NasalA-p-l
Fish-Pescion	pwasō	p-w-ah-s-on
Bird-Avicellum	wa---z-o----	w-ah-zz-oh
ToDrink	b--waɤ-	b-w-a-rr
ToEat-Manducare	mã-ʒ--e--	m-NasalA-gzah-ay
ToBite	moɤd-ɤ-	m-oh-rr-d-rr
ToSuck	syse--	s-eeh-s-ay
ToSpit	kɔ-spye--	k-oon-s-p-eeh-ay
ToKnow-Sapere	savwaɤ-	s-ah-v-w-ah-rr
ToKnow-Cognoscere	kɔ-nɛ-tɤ-	k-euh-n-eh-t-rr
ToThink	kɤ--ide--	k-eu-e-d-ay
ToThink-Pensare	pã-se--	p-NasalA-s-ay
ToFear-Tremere	kɤẽ-d-ɤ-	k-rr-ehn-d-rr
ToSleep	d-ɔɤmiɤ-	d-euh-rr-m-e-rr
ToLive	viv-ɤ-	v-e-v-rr
ToDie	muɤiɤ-	m-u-rr-e-rr
ToSwim-Navigare	na--ʒe--	n-ah-gzah-ay
ToFly	vole--	v-oh-l-ay
ToCome	vəniɤ-	v-aah-n-e-rr
ToFall	fwa--ɤ-	shh-w-ah-rr
ToFall-Tumbare	tō-be-	t-on-b-ay
ToSing-AncestralClass	fã-te--	shh-NasalA-t-ay
ToPlay-Jiocare	ʒ-w-e--	gzah-w-ay
ToFreeze	ʒəle--	gzah-aah-l-ay

Appendix 4 - Word Lists by Language

ToFreeze-Glaciare	gla-s-e--	g-l-ah-s-ay
Sun-Soliculus	sɔlɛj----	s-euh-l-eh_diphthong
Moon	lyn-	l-eeh-n
Star	e-twa-l-	ay-t-w-ah-l
Water	o----	oh
Rain	plɥ--i-	p-l-eu-e
Lake	lak--	l-ah-k
Sea	mɛʁ-	m-eh-rr
Salt	sɛl--	s-eh-l
Earth	t-e-ʁ-	t-ay-rr
Sky	sjɛl--	s-jg-eh-l
Wind	v-ã----	v-NasalA
Fire-Focus	f-ø---	f-uu
Green	veʁ----	v-ay-rr
Year	ã----	NasalA
Name-Nomen	nɔ̃---	n-oon
Tongue	lã-g--	l-NasalA-g

Spanish

Ancestral Class	IPA	Sounds
I	-j-o	VdPalatalFricative-oh
We	no-s	n-oh-s
YouPlural	bo-s	b-oh-s
Here	-a-k---i-	ah-k-e
There	a-ja-	ah-VdPalatalFricative-ah
There-Adlbi	ai	ah-e
Who-Quem	kjen-	k-jg-ay-n
What	k-e-	k-ay
When-Quando	kwando	k-w-ah-n-d-oh
How-Quomodo	komo--	k-oh-m-oh
One	'uno-	u-n-oh
Two-Duos	d-os	d-oh-s
Three	tr-es	t-er-ay-s
Five	'θink-o	th-e-n-k-oh
Big	ma-ɲo-	m-ah-VdPalatalNasal-oh
Big-Grandem	grande-	g-er-ah-n-d-ay
Long-Longum	lo-ngo-	l-oh-n-j-oh
Long-Largum	laryo-	l-ah-er-juh-oh
Wide	lato-	l-ah-t-oh
Wide-Amplum	antʃ-o-	ah-n-ts-oh

Appendix 4 - Word Lists by Language

Fish-Piskem	peθ---	p-ay-th
Bird-Avem	abe-	ah-b-ay
Bird-Passerem	pa-xaro-	p-ah-xha-ah-er-oh
ToDrink	beb-er-	b-ay-b-ay-er
ToEat	kome--r-	k-oh-m-ay-er
ToEat-Manducare	mandukar-	m-ah-n-d-u-k-ah-er
ToBite	morðer-	m-oh-er-dd-ay-er
ToBite-Morsicare	mo-s-kar-	m-oh-s-k-ah-er
ToSpit-Exconspuere	esku-pir	ay-s-k-u-p-e-er
ToSpit-Sputare	esputar-	ay-s-p-u-t-ah-er
ToKnow-Sapere	sab-er-	s-ah-b-ay-er
ToKnow-Cognoscere	ko-noθer-	k-oh-n-oh-th-ay-er
ToThink	kw--idar-	k-w-e-d-ah-er
ToThink-Pensare	pensar-	p-ay-n-s-ah-er
ToFear	temer-	t-ay-m-ay-er
ToFear-Tremere	trem-er-	t-er-ay-m-ay-er
ToSleep	d-ormir-	d-oh-er-m-e-er
ToLive	bibir-	b-e-b-e-er
ToDie	morir-	m-oh-er-e-er
ToSwim	n-adar-	n-ah-d-ah-er
ToSwim-Navigare	nabegar-	n-ah-b-ay-g-ah-er
ToFly	bolar-	b-oh-l-ah-er
ToCome	benir-	b-ay-n-e-er
ToFall	k-a-er-	k-ah-ay-er
ToFall-Tumbare	tumbar	t-u-m-b-ah-er
ToSing-AncestralClass	kantar-	k-ah-n-t-ah-er
ToPlay-Ludere	ludir-	l-u-d-e-er
ToPlay-Jiocare	xu-gar-	xha-u-j-ah-er
ToFreeze	-elar--	ay-l-ah-er
Sun	sol--	s-oh-l
Moon	luna	l-u-n-ah
Star	estre-ja	ay-s-t-er-ay-VdPalatalFricativeah
Water	'a-ywa	ah-juh-w-ah
Rain	j-u-bja	VdPalatalFricativeu-b-jg-ah
Lake	lago-	l-ah-j-oh
Sea	mar-	m-ah-er
Salt	sal--	s-ah-l
Earth	'tje-ra	t-jg-ay-r-ah
Sky	'θjelo	th-jg-ay-l-oh
Wind	'bjento-	b-jg-ay-n-t-oh
Fire-Focus	fwego-	f-w-ay-g-oh

Appendix 4 - Word Lists by Language

Green	ber-de-	b-ay-er-d-ay
Year	a-ŋo-	ah-VdPalatalNasal-oh
Name-Nominem	nom-bre-	n-oh-m-b-er-ay
Tongue	'lengwa	l-ay-nya-g-w-ah

Italian

Ancestral Class	IPA	Sounds
I	-i-o	e-oh
We	no:i-	n-O-e
YouPlural	'vo:i-	v-O-e
Here	---kw--i-	k-w-e
There	--la-	l-ah
There-Ibi	-vi	v-e
Who-Qui	k-i-	k-e
What	k-e-	k-ay
When-Quando	kwando	k-w-ah-n-d-oh
How-Quomodo	kome--	k-oh-m-ay
One	'uno-	u-n-oh
Two-Duae	du-e	d-u-ay
Three	'tr-e-	t-r-ay
Five	'tʃɪŋkwe	ts-e-nya-k-w-ay
Big	mappo-	m-ah-VdPalatalNasal-VdPalatalNasal-oh
Big-Grandem	grande-	g-r-ah-n-d-ay
Long-Longum	lu-ngo-	l-u-n-g-oh
Long-Largum	largo-	l-ah-r-g-oh
Wide	lato-	l-ah-t-oh
Wide-Amplum	ampjo-	ah-m-p-jg-oh
Fish-Piskem	peffe-	p-ay-shh-shh-ay
Bird-Avicellum	--u-ttʃ-ello-	u-t-ts-eh-l-l-oh
Bird-Passerem	passero-	p-ah-s-s-ay-r-oh
ToDrink	be---re	b-ay-er-ay
ToEat-Manducare	mandʒ--a:re	m-ah-n-VdPalatoAlveolarSibilant-A-er-ay
ToBite	mordere	m-euh-r-d-ay-r-ay
ToBite-Morsicare	morsikare	m-oh-r-s-e-k-ah-er-ay
ToSpit-Sputare	-sputa:re	s-p-u-t-A-er-ay
ToKnow-Sapere	sap-e:re	s-ah-p-ai-r-ay
ToKnow-Cognoscere	ko-noʃʃere	k-oh-n-oh-shh-shh-ay-r-ay
ToThink	k-odʒita:re	k-oh-VdPalatoAlveolarSibilant-e-t-A-r-ay
ToThink-Pensare	pensa:re	p-ay-n-s-A-er-ay
ToFear	teme:re	t-ay-m-ai-r-ay

Appendix 4 - Word Lists by Language

ToFear-Tremere	trem-a:re	t-r-ay-m-A-r-ay
ToSleep	d-ormi:re	d-oh-r-m-E-r-ay
ToLive	vi:vere	v-E-v-ay-r-ay
ToDie	mori:re	m-oh-r-E-r-ay
ToSwim	nwota:re	n-w-oh-t-A-er-ay
ToSwim-Navigare	navigare	n-ah-v-e-g-ah-r-ay
ToFly	vola:re	v-oh-l-A-er-ay
ToFly-Exvolare	zvola:re	zz-v-oh-l-A-er-ay
ToCome	veni:re	v-ay-n-E-er-ay
ToFall	k-ade:re	k-ah-d-ai-er-ay
ToSing-AncestralClass	kanta:re	k-ah-n-t-A-r-ay
ToPlay-Jiocare	dʒo-ka:re	VdPalatoAlveolarSibilant-oh-k-A-r-ay
ToFreeze	dʒelare	VdPalatoAlveolarSibilant-ay-l-ah-r-ay
ToFreeze-Glaciare	gʒatʃjare	g-jg-ah-t-ts-jg-ah-r-ay
Sun	sole-	s-oh-l-ay
Moon	luna	l-u-n-ah
Star	-st-ella	s-t-ay-l-l-ah
Water	akkwa	ah-k-k-w-ah
Rain	pjodɔ̃-a	p-jg-oh-d-VdPalatoAlveolarSibilant-ah
Lake	lago-	l-ah-g-oh
Sea	mare	m-ah-r-ay
Salt	sale-	s-ah-l-ay
Earth	't-erra	t-eh-r-r-ah
Sky	'tʃ-elo-	ts-eh-l-oh
Wind	'v-ento-	v-eh-n-t-oh
Fire-Focus	fwɔko-	f-w-euh-k-oh
Green	ver-de-	v-ay-r-d-ay
Year	anno-	ah-n-n-oh
Name-Nomen	no:me-	n-O-m-ay
Tongue	'lingwa	l-e-n-g-w-ah

Brazilian Portuguese

Ancestral Class	IPA	Sounds
I	-e-w	ay-w
We	nɔj-s	n-euh-jg-s
YouPlural	vɔjs	v-euh-jg-s
Here	-a-k---i-	ah-k-e
There	--la-	l-ah
There-Adlbi	ai	ah-e
Who-Quem	k-ẽj--	k-nasal_diphthong_portuguese1

Appendix 4 - Word Lists by Language

What	k-i-	k-e
When-Quando	kwě-du	k-w-ahn-d-u
How-Quomodo	komu--	k-oh-m-u
One	ũ---	ooo
Two-Duos	d-ojs	d-øj_diphthong-s
Two-Duas	duəs	d-u-ahh-s
Three	tr-es	t-er-ay-s
Five	'sĩ-k-u	s-een-k-u
Big-Grandem	grě-ɖʒi-	g-er-ahn-VdPalatoAlveolarSibilant-e
Long-Longum	lõ-gu-	l-on-g-u
Long-Largum	laɣgu-	l-ah-rr-g-u
Wide	latu-	l-ah-t-u
Wide-Amplum	ě-f-u-	ahn-shh-u
Fish-Piskem	pejʃ-i-	p-ej_diphthong-shh-e
Bird-Avem	avi-	ah-v-e
Bird-Passerem	pa-seɾu-	p-ah-s-ahh-er-u
ToDrink	beb-eɤ-	b-ay-b-ay-rr
ToEat	kome---	k-oh-m-ay
ToEat-Manducare	mě-ʒ--aɤ-	m-ahn-gzah-ah-rr
ToBite	moɤdeɤ-	m-oh-rr-d-ay-rr
ToBite-Morsicare	mu-səga--	m-u-s-aah-g-ah
ToSuck	sugaɤ-	s-u-g-ah-rr
ToSpit	ku-spiɤ-	k-u-s-p-e-rr
ToKnow-Sapere	sab-eɤ-	s-ah-b-ay-rr
ToKnow-Cognoscere	ko-ɲes-eɤ-	k-oh-VdPalatalNasal-ay-s-ay-rr
ToThink	k-uʒitaɤ-	k-u-gzah-e-t-ah-rr
ToThink-Pensare	pě-saɤ-	p-ehn-s-ah-rr
ToFear	temeɤ-	t-ay-m-ay-rr
ToFear-Tremere	trem-eɤ-	t-er-ay-m-ay-rr
ToSleep	d-oɤmiɤ-	d-oh-rr-m-e-rr
ToLive	viveɤ-	v-e-v-ay-rr
ToDie	moɤeɤ-	m-oh-rr-ay-rr
ToSwim	n-adaɤ-	n-ah-d-ah-rr
ToSwim-Navigare	naviɣaɤ-	n-ah-v-eee-juh-ah-rr
ToFly	vo-aɤ-	v-oh-ah-rr
ToCome	v--iɤ-	v-e-rr
ToFall	k-e-iɤ-	k-ahh-e-er
ToFall-Tumbare	tõ-baɤ	t-on-b-ah-rr
ToSing-AncestralClass	kě-taɤ-	k-ahn-t-ah-er
ToPlay-Jiocare	ʒo-gaɤ-	gzah-oh-g-ah-rr
ToFreeze	ʒilaɤ-	gzah-eee-l-ah-er

Appendix 4 - Word Lists by Language

Sun	sɔw--	s-euh-w
Moon	lu-ɐ	l-u-ahh
Star	istre-le	e-s-t-er-ay-l-ahh
Water	'a-gwɐ	ah-g-w-ahh
Rain	f-u-v-ɐ	shh-u-v-ahh
Lake	lagu-	l-ah-g-u
Sea	maʁ-	m-ah-rr
Salt	saw--	s-ah-w
Earth	't-e-ʁɐ	t-ay-rr-ahh
Sky	s-ɛw--	s-eh-w
Wind	'v-ẽ-tu-	v-ehn-t-u
Fire-Focus	f-ogu-	f-oh-g-u
Green	ver-di-	v-ay-er-d-eee
Year	ɐ-nu-	ahh-n-u
Name-Nomen	nomi-	n-oh-m-e
Tongue	'lĩ-gwɐ	l-een-g-w-ahh

Portuguese

Ancestral Class	IPA	Sounds
I	-e-w	ay-w
We	nɔ-f	n-euh-shh
YouPlural	vo-f	v-oh-shh
Here	-ɐ-k---i-	ahh-k-e
There	--la-	l-ah
There-Adlbi	ɐi	ahh-e
Who-Quem	k-ẽj--	k-nasal_diphthong_portuguese2
What	k-i-	k-eee
When-Quando	kwẽ-du	k-w-ahn-d-u
How-Quomodo	komu--	k-oh-m-u
One	ũ---	ooo
Two-Duos	d-ojɸ	d-oj_diphthong-shh
Two-Duas	dueɸ	d-u-ahh-shh
Three	tr-eɸ	t-er-ay-shh
Five	'sĩ-k-u	s-een-k-u
Big-Grandem	grẽ-di-	g-er-ahn-d-eee
Long-Longum	lõ-gu-	l-on-g-u
Long-Largum	largu-	l-ah-er-g-u
Wide	latu-	l-ah-t-u
Wide-Amplum	ẽ-f-u-	ahn-shh-u
Fish-Piskem	pejɸ-i-	p-diphthong_portuguese-shh-eee

Appendix 4 - Word Lists by Language

Bird-Avem	avi-	ah-v-eee
Bird-Passerem	pa-sɛru-	p-ah-s-ahh-er-u
ToDrink	biβ-er-	b-eee-bb-ay-er
ToEat	kum--er-	k-u-m-ay-er
ToEat-Manducare	mẽ-ʒ--ar-	m-ahn-gzah-ah-er
ToBite	murðer-	m-u-er-dd-ay-er
ToBite-Morsicare	mu-səgar-	m-u-s-aah-g-ah-r
ToSuck	sugar-	s-u-g-ah-er
ToSpit	ku-ʃpir-	k-u-shh-p-e-er
ToKnow-Sapere	səb-er-	s-ahh-b-ay-er
ToKnow-Cognoscere	ku-nis-er-	k-u-VdPalatalNasal-eee-s-ay-er
ToThink	k-uʒitar-	k-u-gzah-e-t-ah-er
ToThink-Pensare	pẽ-sar-	p-ehn-s-ah-er
ToFear	timer-	t-eee-m-ay-er
ToFear-Tremere	trim-er-	t-er-eee-m-ay-er
ToSleep	d-urmir-	d-u-er-m-e-er
ToLive	viver-	v-e-v-ay-er
ToDie	muʁer-	m-u-rr-ay-er
ToSwim	n-eðar-	n-ahh-dd-ah-er
ToSwim-Navigare	neviyar-	n-ahh-v-eee-juh-ah-er
ToFly	vw-ar-	v-w-ah-er
ToCome	v--ir-	v-e-er
ToFall	k-e-ir-	k-ahh-e-er
ToFall-Tumbare	tõ-bar	t-on-b-ah-er
ToSing-AncestralClass	kẽ-tar-	k-ahn-t-ah-er
ToPlay-Jiocare	ʒu-yar-	gzah-u-juh-ah-er
ToFreeze	ʒilar-	gzah-eee-l-ah-er
Sun	sɔt--	s-euh-ssha
Moon	lu-e	l-u-ahh
Star	ɨftre-le	eee-shh-t-er-ay-l-ahh
Water	'a-gwɐ	ah-g-w-ahh
Rain	ʃ-u-v-ɐ	shh-u-v-ahh
Lake	layu-	l-ah-juh-u
Sea	mar-	m-ah-er
Salt	sal--	s-ah-l
Earth	't-ɛ-ʁɐ	t-eh-rr-ahh
Sky	s-ɛw--	s-eh-w
Wind	'v-ẽ-tu-	v-ehn-t-u
Fire-Focus	f-oʏu-	f-oh-juh-u
Green	ver-di-	v-ay-er-d-eee
Year	e-nu-	ahh-n-u

Appendix 4 - Word Lists by Language

Name-Nomen	nomi-	n-oh-m-eee
Tongue	'lĩ-gwē	l-eeen-g-w-ahh

Catalan

Ancestral Class	IPA	Sounds
I	-ʒɔ	gzah-euh
YouPlural	bu-s	b-u-s
Here	-a-k---i-	ah-k-e
There	ə-ʎa-	aah-yuh-ah
Who-Qui	k-i-	k-e
What	k-ε-	k-eh
When-Quando	kwan	k-w-ah-n
How-Quomodo	kɔm---	k-euh-m
One	'un--	u-n
Two-Duos	d-os	d-oh-s
Three	'tr-εs	t-r-eh-s
Five	'siŋk--	s-e-nya-k
Big-Grandem	gran---	j-r-ah-n
Long-Longum	ʎo-ŋ---	yuh-oh-nya
Long-Largum	ʎark--	yuh-ah-er-k
Wide-Amplum	amplə-	ah-m-p-l-aah
Fish-Piskem	peʃ---	p-ay-shh
Bird-Avem	aw--	ah-w
Bird-Avicellum	--u--s-e-ʎ--	u-s-ay-yuh
ToDrink	bɛw--rə	b-eh-w-er-aah
ToEat-Manducare	məɲʒ--a--	m-aah-VdPalatalNasal-gzah-ah
ToBite-Morsicare	mu-səʎa--	m-u-s-aah-juh-ah
ToSpit-Exconspuere	əsku-pi--	aah-s-k-u-p-e
ToKnow-Sapere	səβ-ε--	s-aah-bb-eh
ToKnow-Cognoscere	ku-neʃ-ə--	k-u-n-eh-shh-aah
ToThink	k-u-jda--	k-u-jg-d-ah
ToThink-Pensare	pənsa--	p-aah-n-s-ah
ToFear	temə--	t-ay-m-aah
ToSleep	d-urmi--	d-u-r-m-e
ToLive	biw-rə	b-e-w-er-aah
ToDie	muri--	m-u-er-e
ToSwim	n-əda--	n-aah-d-ah
ToSwim-Navigare	nəbəga--	n-aah-b-aah-g-ah
ToFly	bula--	b-u-l-ah
ToCome	bəni--	b-aah-n-e

Appendix 4 - Word Lists by Language

ToFall	k-aw-rə	k-ah-w-r-aah
ToFall-Tumbare	tumba-	t-u-m-b-ah
ToSing-AncestralClass	kənta--	k-aah-n-t-ah
ToPlay-Jiocare	zu-ga--	gzah-u-g-ah
ToFreeze	zəla--	gzah-aah-l-ah
ToFreeze-Glaciare	glə-s-a--	g-l-aah-s-ah
Sun	səl--	s-euh-l
Moon	ʎunə	yuh-u-n-aah
Star	əst-ɛ-l-	aah-s-t-eh-l
Water	'aj-ɣwə	aj_diphthong-juh-w-aah
Rain	plu-ʒ-ə	p-l-u-gzah-aah
Lake	ʎak--	yuh-ah-k
Sea	mar-	m-ah-r
Salt	sal--	s-ah-l
Earth	't-ɛ-rə	t-eh-r-aah
Sky	s-ɛl--	s-eh-l
Wind	b-en---	b-ay-n
Fire-Focus	f-ɔk--	f-euh-k
Green	vɛr-t--	v-eh-er-t
Year	a-ɲ--	ah-VdPalatalNasal
Name-Nomen	nɔm--	n-euh-m

Walloon

Ancestral Class	IPA	Sounds
I	-dʒ-ɪ	VdPalatoAlveolarSibilant -NearCloseFrontUnrounded
We	no--	n-oh
YouPlural	vo-s	v-oh-s
There	--la-	l-ah
Who-Qui	k-i:-	k-E
What	kwɛ:-	k-w-Eh
When-Quando	kwand	k-w-ah-n-d
How-Quomodo	kɔmɛ--	k-euh-m-ehnn
One	õ---	on
Two-Duos	d-ø:-	d-o
Three	tr-ø:-	t-r-o
Five	sɛ-k--	s-ehn-k
Big-Grandem	gʁã---	j-rr-an
Long-Longum	lõ----	l-on
Fish-Pescion	p-ɛhõ	p-eh-h-on

Appendix 4 - Word Lists by Language

Bird-Avicellum	--u:--h-ε:----	U-h-Eh
ToDrink	b---ø:ʁ-	b-o-rr
ToEat-Manducare	maɲ---i:--	m-ah-VdPalatalNasal-E
ToSuck	sysi:--	s-eeh-s-E
ToKnow-Sapere	sav-ø:ʁ-	s-ah-v-o-VIUvularTrill
ToKnow-Cognoscere	ki-nɔh----	k-e-n-euh-h
ToThink-Pensare	pẽ-se--	p-ehnn-s-ay
ToSleep	dwaʁmi--	d-w-ah-rr-m-e
ToDie	mɔri--	m-euh-VIUvularTrill-e
ToSwim-Navigare	nε--dʒi:--	n-eh-VdPalatoAlveolarSibilant-E
ToFly	vɔle--	v-euh-l-ay
ToCome	vini--	v-e-n-e
ToFall	tʃ-ε:--ʁ-	ts-Eh-VIUvularTrill
ToFall-Tumbare	tum-e-	t-u-m-ay
ToSing-AncestralClass	tʃã-te--	ts-an-t-ay
ToPlay-Jiocare	dʒuw-e--	VdPalatoAlveolarSibilant-u-w-ay
ToFreeze	dʒale--	VdPalatoAlveolarSibilant-ah-l-ay
Sun	sɔb-	s-euh-l-euh
Moon	løn-	l-uu-n
Star	-st-ø:l-	s-t-o-l
Water	ε:--w-	Eh-w
Rain	plu:ʁ--	p-l-U-rr
Lake	lak--	l-ah-k
Sea	meʁ-	m-ay-rr
Salt	se---	s-ay
Earth	t-ε:ʁ-	t-Eh-rr
Sky	s-i:ʁ--	s-E-rr
Wind	v-ẽ----	v-ehn
Fire-Focus	f-ø:---	f-o
Green	vεʁ----	v-eh-rr
Year	ã----	an
Name-Nomen	nõ---	n-on
Tongue	lẽu-----	l-eu_nasalized_diphthong

Friulian

Ancestral Class	IPA	Sounds
I	-j-o	jg-oh
We	no:--	n-O
YouPlural	vo:--	v-O
Here	-a-k---i-	ah-k-e

Appendix 4 - Word Lists by Language

Who-Qui	kwi-	k-w-e
What	tʃ-e-	ts-ay
When-Quando	kwant	k-w-ah-n-t
How-Quomodo	tʃemur-t-	VlAlveoloPalatalSibilantAffricate-ay-m-U -t
One	uŋ--	u-nya
Two-Duos	d-oj-	d-oj_diphthong
Three	'tr-e:-	t-r-ai
Five	'tʃɪŋk--	ts-e-nya-k
Big-Grandem	grant--	j-r-ah-n-t
Long-Longum	lunk--	l-u-n-k
Long-Largum	lark--	l-ah-r-k
Fish-Piskem	pɛs---	p-eh-s
Bird-Avicellum	--u--tʃjɛ-l--	u-ts-jg-eh-l
ToDrink	bevi--	b-ay-v-e
ToEat-Manducare	manj--a--	m-ah-nya-VdPalatalStop-ah
ToKnow-Sapere	sav-e:-	s-ah-v-ai
ToKnow-Cognoscere	ko-nos-i--	k-oh-VdPalatalNasal-oh-s-e
ToThink-Pensare	pensa:-	p-ay-nya-s-A
ToFear	temi--	t-ay-m-e
ToFear-Tremere	trim-a:-	t-r-e-m-A
ToSleep	d-urmi:-	d-u-r-m-E
ToLive	vivi--	v-e-v-e
ToDie	muri:-	m-u-r-E
ToSwim	n-ada--	n-ah-d-ah
ToSwim-Navigare	naviga--	n-ah-v-e-j-ah
ToFly-Exvolare	zvola--	zz-v-oh-l-ah
ToCome	vipi:-	v-e-VdPalatalNasal-E
ToFall	tʃjade--	ts-jg-ah-d-ay
ToSing-AncestralClass	canta:-	tya-ah-n-t-A
ToPlay-Jiocare	dʒuj-a--	VdPalatoAlveolarSibilant-u-jg-ah
ToFreeze-Glaciare	gla-tʃ-a--	j-l-ah-ts-ah
Sun-Soliculus	sore--li-	s-oh-r-ay-l-e
Moon	lune	l-u-n-ay
Star	-st-ɛ-le	s-t-eh-l-ay
Water	a-g-e	ah-j-ay
Rain	plo--je	p-l-oh-jg-ay
Lake	la:t--	l-A-t
Sea	ma:r-	m-A-r
Salt	sa:l--	s-A-l
Earth	tʃɛ-re	t-jg-eh-r-ay

Appendix 4 - Word Lists by Language

Sky	ʈʂ-i:l--	ts-E-l
Wind	'v-int--	v-e-n-t
Fire-Focus	f-u:k--	f-U-k
Green	vɛr-t--	v-eh-r-t
Year	a-ŋ--	ah-nya
Name-Nomen	nɔŋ--	n-euh-nya
Tongue	'lɛŋg-ɛ	l-eh-n-j-eh

Romanian

Ancestral Class	IPA	Sounds
I	je-w	jg-ay-w
We	noj-	n-oj_diphthong
YouPlural	voj-	v-oj_diphthong
There	--la-	l-ah
Who-Quem	ʈʂ-ine	VlAlveoloPalatalSibilantAffricate-e-n-ay
What	ʈʂ-e-	ts-ay
When-Quando	k-ind	k-eee-n-d
How-Quomodo	kum---	k-u-m
One	unu-	u-n-u
Two-Duos	d-oj-	d-oj_diphthong
Two-Duae	dowə	d-oh-w-aah
Three	tr-ej-	t-r-ej_diphthong
Five	ʈʂintʂ--	ts-e-n-ts
Big-Majjorem	ma---re-	m-ah-er-ay
Long-Longum	lung--	l-u-n-j
Long-Largum	larg--	l-ah-r-j
Wide	lat--	l-ah-t
Fish-Piskem	pefte-	p-ay-shh-t-ay
Bird-Passerem	pa-səre-	p-ah-s-aah-er-ay
ToDrink	b---ɛa--	b-midfront_diphthong_romanian
ToEat-Manducare	min--ka--	m-eee-n-k-ah
ToBite-Morsicare	murseka--	m-u-r-s-ay-k-ah
ToSuck	sudʒe--	s-u-VdPalatoAlveolarSibilant-ay
ToSpit-Exconspuere	-skujpa	s-k-u-jg-p-ah
ToKnow	ʃti--	shh-t-e
ToKnow-Cognoscere	ku-noaşte--	k-u-n-midback_diphthong_romanian-shh-t-ay
ToThink	k-udʒeta--	k-u-VdPalatoAlveolarSibilant-ay-t-ah
ToThink-Pensare	pə-sa--	p-aah-s-ah
ToFear	teme--	t-ay-m-ay

Appendix 4 - Word Lists by Language

ToSleep	d-ormi--	d-oh-r-m-e
ToLive	vi-a--	v-e-ah
ToDie	muri--	m-u-r-e
ToSwim-Navigare	naviga--	n-ah-v-e-g-ah
ToFly-Exvolare	zbura--	zz-b-u-er-ah
ToCome	veni--	v-ay-n-e
ToFall	kədə--	k-aah-d-midfront_diphthong_romanian
ToFall-Tumbare	tumba-	t-u-m-b-ah
ToSing-AncestralClass	kinta--	k-eee-n-t-ah
ToPlay-Jiicare	zu-ka--	gzah-u-k-ah
ToFreeze-Inglaciare	ing-ets-a--	eee-n-j-ay-VlAlveolarSibilantAffricate-ah
Sun	soare-	s-midback_diphthong_romanian-er-ay
Moon	lună	l-u-n-aah
Star	-st-ea---	s-t-midfront_diphthong_romanian
Water	a-p-ə	ah-p-aah
Rain	plăa--je	p-l-midback_diphthong_romanian-jg-ay
Lake	lak--	l-ah-k
Sea	mare	m-ah-r-ay
Salt	sare-	s-ah-r-ay
Earth	ts-a-rə	VlAlveolarSibilantAffricate-ah-r-aah
Sky	tʃ-er--	ts-ay-er
Wind	v-int--	v-eee-n-t
Fire-Focus	f-ok--	f-oh-k
Green	ver-de-	v-ay-er-d-ay
Year	an---	ah-n
Name-Nomen	nume-	n-u-m-ay
Tongue	'limb-ə	l-e-m-b-aah

Appendix 5 - Segment Groups

Pulmonic Consonants

Manner	Bilabial	Labial-Velar	Labio-Dental	Linguo-Labial	Dental	Alveolar	Post-Alveolar	Palatal	Velar	Uvular	Pharyngeal-E	Glottal
Nasal	m					n		ɲ	ŋ			
Stop	p b	k ^w g ^w				t d		c ɟ	k g			
Sibilant, Fricative						s z	ʃ ʒ					
Fricative	β		f v		θ ð			j	x ɣ	ʁ		h
Approximant								j				
Tap/Flap						r						
Trill						r				R		
Lateral, Fricative												
Lateral, Ap						l		ʎ				
Lateral, Tap/Flap												

Shaded areas denote articulations judged to be impossible. Where symbols appear in pairs, the one to the right represents a modally voiced consonant.

Non-Pulmonic Consonants

Manner	Bilabial	Labio-Dental	Velar	Uvular	Pharyngeal-Epiglottal
Ejective, Stop					
Ejective, Fricative					
Ejective, Lateral, Fricative					
Tenuis, Click					
Nasal, Click					
Tenuis, Lateral, Click					
Implosive					

Shaded areas denote articulations judged to be impossible. Where symbols appear in pairs, the one to the right represents a modally voiced consonant.

Appendix 5 - Segment Groups

Vowels

	Front	Near-Front	Central	Near-Back	Back
Close	i • y		ɨ		u
Near-close		ɪ			
Close-mid	e • ø		ə		o
Mid					
Open-mid		ɛ			ɔ
Near-open			ɐ		
Open		a			ɑ

Where symbols appear in pairs, the one to the right represents a rounded vowel.

Long Vowels

	Front	Near-Front	Central	Near-Back	Back
Close	iː				uː
Mid	eː				oː
Open-mid		ɛː			
Open	øː		aː		

Pulmonic Affricates

Manner	Bilabial	Labio-Dental	Alveolar	Alveolo-Palat	Palato-Alveol	Velar	Uvular	Pharyngeal-E	Glottal
Sibilant			ts	tʃ	tʃ				
Non-Sibilant									
Lateral									

Shaded areas denote articulations judged to be impossible.

Ejective Affricates

Manner	Bilabial	Labio-Dental	Pharyngeal-E	Glottal
Central				
Lateral				

Shaded areas denote articulations judged to be impossible.

Appendix 5 - Segment Groups

Other Segments

e Close-mid Front Vocoid Vowel Continuant	g Velar Voiced Pulmonic Stop Occlusive
oː Mid Back Rounded Vocoid Long Vowel Continuant	ʒ Post-Alveolar Voiced Pulmonic Sibilant Fricative Strident Obstruent Continuant
ə Close-mid Central Vowel	j Palatal Voiced Pulmonic Fricative Obstruent Continuant
o Close-mid Back Rounded Vocoid Vowel Continuant	i Close Front Vocoid Vowel Continuant
w Labial-Velar Vocoid Semivowel Voiced Approximant Continuant	ɔ Open-mid Back Rounded Vocoid Vowel Continuant
dʒ Palato-Alveolar Voiced Sibilant Affricate	ɪ Near-close Near-Front Vowel
j Palatal Vocoid Semivowel Voiced Pulmonic Approximant Continuant	n Alveolar Voiced Pulmonic Nasal Occlusive
s Alveolar Pulmonic Sibilant Fricative Strident Obstruent Continuant	u Close Back Rounded Vocoid Vowel Continuant
ʃ Post-Alveolar Pulmonic Sibilant Fricative Strident Obstruent Continuant	oj Mid Front Vowel Diphthong
v Labio-Dental Voiced Pulmonic Fricative Strident Obstruent Continuant	b Bilabial Voiced Pulmonic Stop Occlusive
k Velar Pulmonic Stop Occlusive	m Bilabial Voiced Pulmonic Nasal Occlusive
h Glottal Pulmonic Fricative	iː Close Front Vocoid Long Vowel Continuant
a Open Near-Front Vocoid Vowel Continuant	ɐ Near-open Central Rounded Vowel
l Alveolar Vocoid Voiced Pulmonic Lateral Approximant Rhotic Liquid	aː Open Central Vocoid Long Vowel Continuant
ʎ Palatal Vocoid Voiced Pulmonic Lateral Approximant Rhotic Liquid	k Labial-Velar Pulmonic Stop Occlusive
ẽj Mid Front Nasal Vowel Diphthong	ẽj Mid Front Nasal Vowel Diphthong
ʈʃ Alveolo-Palatal Pulmonic Sibilant Affricate	d Alveolar Voiced Pulmonic Stop Occlusive
ɨ Close Central Vowel	ɛ Open-mid Near-Front Vocoid Vowel Continuant
ɛː Open-mid Near-Front Vocoid Long Vowel Continuant	ʈʃ Palato-Alveolar Pulmonic Sibilant Affricate
ã Near-open Central Nasal Vowel	ẽ Near-open Central Rounded Nasal Vowel
t Alveolar Pulmonic Stop Occlusive	ẽ Open-mid Near-Front Nasal Vowel

Appendix 5 - Segment Groups

u: Close Back Rounded Long Vowel	œ̃ Open-mid Near-Front Rounded Nasal Vowel Diphthong
ũ Open Back Nasal Vowel	õ Close-mid Back Rounded Nasal Vowel
ŋ Velar Voiced Pulmonic Nasal Occlusive	ø Close-mid Front Rounded Vowel Continuant
ø: Open Front Rounded Vowel Long Vowel	aj Mid Front Vowel Diphthong
r Alveolar Voiced Pulmonic Trill Rhotic Vibrant Liquid	e: Mid Front Vowel Long Vowel Continuant
ʁ Uvular Voiced Pulmonic Fricative Rhotic Strident Obstruent Continuant Liquid	a Open Back Vowel Vowel Continuant
f Alveolar Voiced Pulmonic Tap/Flap Rhotic Vibrant Liquid	ej Mid Front Vowel Diphthong
ẽ Close Back Nasal Vowel	θ Dental Pulmonic Fricative Obstruent Continuant
ĩ Close Front Nasal Vowel	g Velar Voiced Pulmonic Stop Occlusive
ɲ Palatal Voiced Pulmonic Nasal Occlusive	õ̃ Open-mid Back Rounded Nasal Vowel
ʏ Velar Voiced Pulmonic Fricative Obstruent Continuant	p Bilabial Pulmonic Stop Occlusive
ã̃ Near-close Back Nasal Vowel	ɐj Mid Front Vowel Diphthong
z Alveolar Voiced Pulmonic Sibilant Fricative Strident Obstruent Continuant	x Velar Pulmonic Fricative Obstruent Continuant
β Bilabial Voiced Pulmonic Fricative Obstruent Continuant	ẽ̃ Mid Front Vowel Diphthong
ʝ Palatal Voiced Pulmonic Stop Occlusive	ð Dental Voiced Pulmonic Fricative Obstruent Continuant
y Close Front Rounded Vowel Vowel Continuant	R Uvular Pulmonic Trill Rhotic Vibrant Liquid
õ̂ Mid Front Vowel Diphthong	ɥ Labial-Palatal Vowel Semivowel Voiced Approximant Continuant
c Palatal Pulmonic Stop Occlusive	ts Alveolar Pulmonic Sibilant Affricate Occlusive Strident
ɭ Alveolar Voiced Velarized Pulmonic Lateral Approximant	ɛj Mid Front Vowel Diphthong

Appendix 5 - Segment Groups

f	Labio-Dental Pulmonic Fricative Strident Obstruent Continuant	g	Labial-Velar Voiced Pulmonic Stop Occlusive
ẽ	Mid Front Vowel Diphthong		

Appendix 6 - International Phonetic Alphabet

IPA Segments

ẽ	θ	β	ʈʂ
1EBD	03B8	03B2	02A7
Close Back Nasal Vowel	Dental Pulmonic Fricative Obstruent Continuant	Bilabial Voiced Pulmonic Fricative Obstruent Continuant	Palato-Alveolar Pulmonic Sibilant Affricate
ts	ɖʒ	j	ʒ
02A6	02A4	029D	0292
Alveolar Pulmonic Sibilant Affricate Occlusive Strident	Palato-Alveolar Voiced Sibilant Affricate	Palatal Voiced Pulmonic Fricative Obstruent Continuant	Post-Alveolar Voiced Pulmonic Sibilant Fricative Strident Obstruent Continuant
ʎ	ʃ	ʁ	ʀ
028E	0283	0281	0280
Palatal Vocoid Voiced Pulmonic Lateral Approximant Rhotic Liquid	Post-Alveolar Pulmonic Sibilant Fricative Strident Obstruent Continuant	Uvular Voiced Pulmonic Fricative Rhotic Strident Obstruent Continuant Liquid	Uvular Pulmonic Trill Rhotic Vibrant Liquid
ɾ	ɳ	ɭ	ɪ
027E	0272	026B	026A
Alveolar Voiced Pulmonic Tap/Flap Rhotic Vibrant Liquid	Palatal Voiced Pulmonic Nasal Occlusive	Alveolar Voiced Velarized Pulmonic Lateral Approximant	Near-close Near-Front Vowel

Appendix 6 - International Phonetic Alphabet

<p style="text-align: center; font-size: 2em;">i</p> <p style="text-align: center;">0268</p> <p style="text-align: center;">Close Central Vowel</p>	<p style="text-align: center; font-size: 2em;">ɥ</p> <p style="text-align: center;">0265</p> <p style="text-align: center;">Labial-Palatal Vocoid Semivowel Voiced Approximant Continuant</p>	<p style="text-align: center; font-size: 2em;">ɣ</p> <p style="text-align: center;">0263</p> <p style="text-align: center;">Velar Voiced Pulmonic Fricative Obstruent Continuant</p>	<p style="text-align: center; font-size: 2em;">ɡ</p> <p style="text-align: center;">0261</p> <p style="text-align: center;">Velar Voiced Pulmonic Stop Occlusive</p>
<p style="text-align: center; font-size: 2em;">ʃ</p> <p style="text-align: center;">025F</p> <p style="text-align: center;">Palatal Voiced Pulmonic Stop Occlusive</p>	<p style="text-align: center; font-size: 2em;">ɛ</p> <p style="text-align: center;">025B</p> <p style="text-align: center;">Open-mid Near-Front Vocoid Vowel Continuant</p>	<p style="text-align: center; font-size: 2em;">ə</p> <p style="text-align: center;">0259</p> <p style="text-align: center;">Close-mid Central Vowel</p>	<p style="text-align: center; font-size: 2em;">ɔ</p> <p style="text-align: center;">0254</p> <p style="text-align: center;">Open-mid Back Rounded Vocoid Vowel Continuant</p>
<p style="text-align: center; font-size: 2em;">ɑ</p> <p style="text-align: center;">0251</p> <p style="text-align: center;">Open Back Vocoid Vowel Continuant</p>	<p style="text-align: center; font-size: 2em;">æ</p> <p style="text-align: center;">0250</p> <p style="text-align: center;">Near-open Central Rounded Vowel</p>	<p style="text-align: center; font-size: 2em;">ũ</p> <p style="text-align: center;">0169</p> <p style="text-align: center;">Open Back Nasal Vowel</p>	<p style="text-align: center; font-size: 2em;">ŋ</p> <p style="text-align: center;">014B</p> <p style="text-align: center;">Velar Voiced Pulmonic Nasal Occlusive</p>
<p style="text-align: center; font-size: 2em;">ĩ</p> <p style="text-align: center;">0129</p> <p style="text-align: center;">Close Front Nasal Vowel</p>	<p style="text-align: center; font-size: 2em;">ø</p> <p style="text-align: center;">00F8</p> <p style="text-align: center;">Close-mid Front Rounded Vocoid Vowel Continuant</p>	<p style="text-align: center; font-size: 2em;">õ</p> <p style="text-align: center;">00F5</p> <p style="text-align: center;">Close-mid Back Rounded Nasal Vowel</p>	<p style="text-align: center; font-size: 2em;">ð</p> <p style="text-align: center;">00F0</p> <p style="text-align: center;">Dental Voiced Pulmonic Fricative Obstruent Continuant</p>
<p style="text-align: center; font-size: 2em;">ã</p> <p style="text-align: center;">00E3</p> <p style="text-align: center;">Near-open Central Nasal Vowel</p>	<p style="text-align: center; font-size: 2em;">z</p> <p style="text-align: center;">007A</p> <p style="text-align: center;">Alveolar Voiced Pulmonic Sibilant Fricative Strident Obstruent Continuant</p>	<p style="text-align: center; font-size: 2em;">y</p> <p style="text-align: center;">0079</p> <p style="text-align: center;">Close Front Rounded Vocoid Vowel Continuant</p>	<p style="text-align: center; font-size: 2em;">x</p> <p style="text-align: center;">0078</p> <p style="text-align: center;">Velar Pulmonic Fricative Obstruent Continuant</p>

Appendix 6 - International Phonetic Alphabet

w	v	u	t
0077	0076	0075	0074
Labial-Velar Vocoid Semivowel Voiced Approximant Continuant	Labio-Dental Voiced Pulmonic Fricative Strident Obstruent Continuant	Close Back Rounded Vocoid Vowel Continuant	Alveolar Pulmonic Stop Occlusive
s	r	p	o
0073	0072	0070	006F
Alveolar Pulmonic Sibilant Fricative Strident Obstruent Continuant	Alveolar Voiced Pulmonic Trill Rhotic Vibrant Liquid	Bilabial Pulmonic Stop Occlusive	Close-mid Back Rounded Vocoid Vowel Continuant
n	m	l	k
006E	006D	006C	006B
Alveolar Voiced Pulmonic Nasal Occlusive	Bilabial Voiced Pulmonic Nasal Occlusive	Alveolar Vocoid Voiced Pulmonic Lateral Approximant Rhotic Liquid	Velar Pulmonic Stop Occlusive
j	i	h	g
006A	0069	0068	0067
Palatal Vocoid Semivowel Voiced Pulmonic Approximant Continuant	Close Front Vocoid Vowel Continuant	Glottal Pulmonic Fricative	Velar Voiced Pulmonic Stop Occlusive

Appendix 6 - International Phonetic Alphabet

f	e	d	c
0066 Labio-Dental Pulmonic Fricative Strident Obstruent Continuant	0065 Close-mid Front Vocoid Vowel Continuant	0064 Alveolar Voiced Pulmonic Stop Occlusive	0063 Palatal Pulmonic Stop Occlusive
b	a	g ^w	ẽ
0062 Bilabial Voiced Pulmonic Stop Occlusive	0061 Open Near-Front Vocoid Vowel Continuant	0261, 02B7 Labial-Velar Voiced Pulmonic Stop Occlusive	025B, 0303 Open-mid Near-Front Nasal Vowel
ɛː	ɛj	õ	ã
025B, 02D0 Open-mid Near-Front Vocoid Long Vowel Continuant	025B, 006A Mid Front Vowel Diphthong	0254, 0303 Open-mid Back Rounded Nasal Vowel	0251, 0303 Near-close Back Nasal Vowel
ẽ	əj	œ	øː
0250, 0303 Near-open Central Rounded Nasal Vowel	0250, 006A Mid Front Vowel Diphthong	0153, 0303 Open-mid Near-Front Rounded Nasal Vowel Diphthong	00F8, 02D0 Open Front Rounded Vocoid Long Vowel
uː	oː	oj	k ^w
0075, 02D0 Close Back Rounded Long Vowel	006F, 02D0 Mid Back Rounded Vocoid Long Vowel Continuant	006F, 006A Mid Front Vowel Diphthong	006B, 02B7 Labial-Velar Pulmonic Stop Occlusive

Appendix 6 - International Phonetic Alphabet

<p style="text-align: center; font-size: 2em;">iː</p> <p style="text-align: center;">0069, 02D0</p> <p style="text-align: center;">Close Front Vocoid Long Vowel Continuant</p>	<p style="text-align: center; font-size: 2em;">eː</p> <p style="text-align: center;">0065, 02D0</p> <p style="text-align: center;">Mid Front Vocoid Long Vowel Continuant</p>	<p style="text-align: center; font-size: 2em;">ej</p> <p style="text-align: center;">0065, 006A</p> <p style="text-align: center;">Mid Front Vowel Diphthong</p>	<p style="text-align: center; font-size: 2em;">aː</p> <p style="text-align: center;">0061, 02D0</p> <p style="text-align: center;">Open Central Vocoid Long Vowel Continuant</p>
<p style="text-align: center; font-size: 2em;">aj</p> <p style="text-align: center;">0061, 006A</p> <p style="text-align: center;">Mid Front Vowel Diphthong</p>	<p style="text-align: center; font-size: 2em;">ẽu</p> <p style="text-align: center;">1EBD, 0075, 032F</p> <p style="text-align: center;">Mid Front Vowel Diphthong</p>	<p style="text-align: center; font-size: 2em;">ẽj</p> <p style="text-align: center;">1EBD, 006A, 0303</p> <p style="text-align: center;">Mid Front Nasal Vowel Diphthong</p>	<p style="text-align: center; font-size: 2em;">tʃ</p> <p style="text-align: center;">0074, 0361, 0283</p> <p style="text-align: center;">Alveolo-Palatal Pulmonic Sibilant Affricate</p>
<p style="text-align: center; font-size: 2em;">o̞a</p> <p style="text-align: center;">006F, 032F, 0061</p> <p style="text-align: center;">Mid Front Vowel Diphthong</p>	<p style="text-align: center; font-size: 2em;">e̞a</p> <p style="text-align: center;">0065, 032F, 0061</p> <p style="text-align: center;">Mid Front Vowel Diphthong</p>	<p style="text-align: center; font-size: 2em;">ẽj̃</p> <p style="text-align: center;">0250, 0303, 006A, 0303</p> <p style="text-align: center;">Mid Front Nasal Vowel Diphthong</p>	

Appendix 7 - Languages

LATIN

A classical language belonging to the Italic branch of the Indo-European languages. Latin was originally spoken in the area around Rome, known as Latium. Through the power of the Roman Republic, it became the dominant language in Italy, and subsequently throughout the western Roman Empire, before eventually becoming a dead language. Latin has contributed many words to the English language. In particular, Latin (and Ancient Greek) roots are used in English descriptions of theology, the sciences, medicine, and law.

By the late Roman Republic (75 BC), Old Latin had been standardised into Classical Latin. Vulgar Latin was the colloquial form spoken at that time and attested in inscriptions and the works of comic playwrights like Plautus and Terence[3] and author Petronius. Late Latin is the written language from the 3rd century; its colloquial form Vulgar Latin developed in the 6th to 9th centuries into the Romance languages, such as Italian, Sardinian, Venetian, Neapolitan, Sicilian, Piedmontese, Lombard, French, Franco-Provençal, Occitan, Corsican, Ladin, Friulan, Romansh, Catalan/Valencian, Aragonese, Spanish, Asturian, Galician, and Portuguese. Medieval Latin was used as a literary language from the 9th century to the Renaissance which used Renaissance Latin. Later, Early Modern Latin and New Latin evolved. Latin was the language of international communication, scholarship and science until well into the 18th century, when vernaculars (including the Romance languages) supplanted it. Ecclesiastical Latin remains the official language of the Holy See and the Roman Rite of the Catholic Church. Latin is a highly inflected language, with three distinct genders, six or seven noun cases, five declensions, four verb conjugations, six tenses, three persons, three moods, two voices, two or three aspects, and two numbers. The Latin alphabet is derived from the Etruscan and Greek alphabets and ultimately from the Phoenician alphabet.



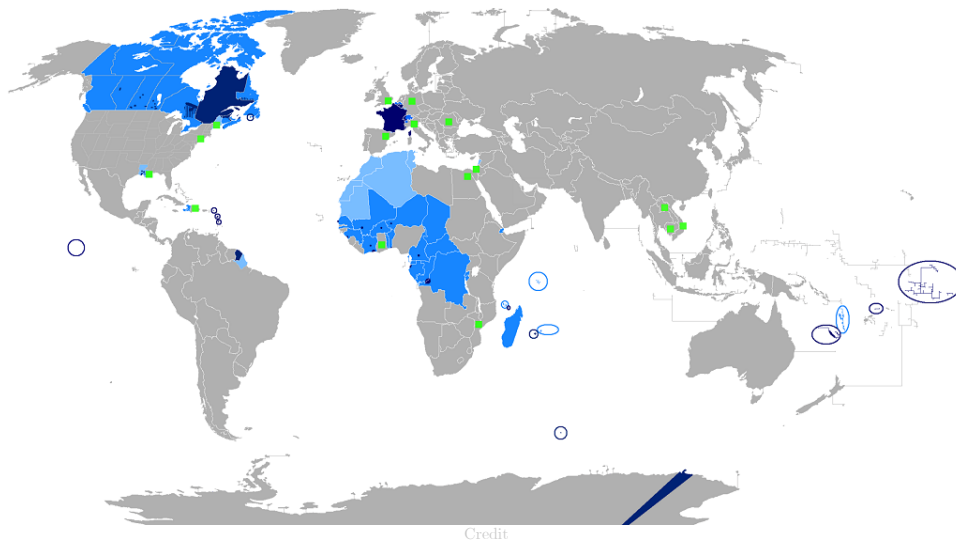
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FRENCH

A Romance language of the Indo-European family. It descended from the Vulgar Latin of the Roman Empire, as did all Romance languages. French evolved from Gallo-Romance, the Latin spoken in Gaul, and more specifically in Northern Gaul. Its closest relatives are the other langues d'oïl—languages historically spoken in northern France and in southern Belgium, which French (Francien) largely supplanted.

French was also influenced by native Celtic languages of Northern Roman Gaul like Gallia Belgica and by the (Germanic) Frankish language of the post-Roman Frankish invaders. Today, owing to France's past overseas expansion, there are numerous French-based creole languages, most notably Haitian Creole. A French-speaking person or nation may be referred to as Francophone in both English and French.

French is an official language in 29 countries across multiple continents, most of which are members of the Organisation internationale de la Francophonie (OIF), the community of 84 countries which share the official use or teaching of French. French is also one of six official languages used in the United Nations. It is spoken as a first language (in descending order of the number of speakers) in France; the Democratic Republic of Congo; Algeria; Morocco; Canada (provinces of Quebec, Ontario and New Brunswick as well as other Francophone regions); Cameroon; Belgium (Wallonia and the Brussels-Capital Region); Ivory Coast; Tunisia; western Switzerland (Romandy—all or part of the cantons of Bern, Fribourg, Geneva, Jura, Neuchâtel, Vaud, Valais); Monaco; parts of Luxembourg; parts of the United States (the states of Louisiana, Maine, New Hampshire and Vermont); northwestern Italy (autonomous region of Aosta Valley); and various communities elsewhere.

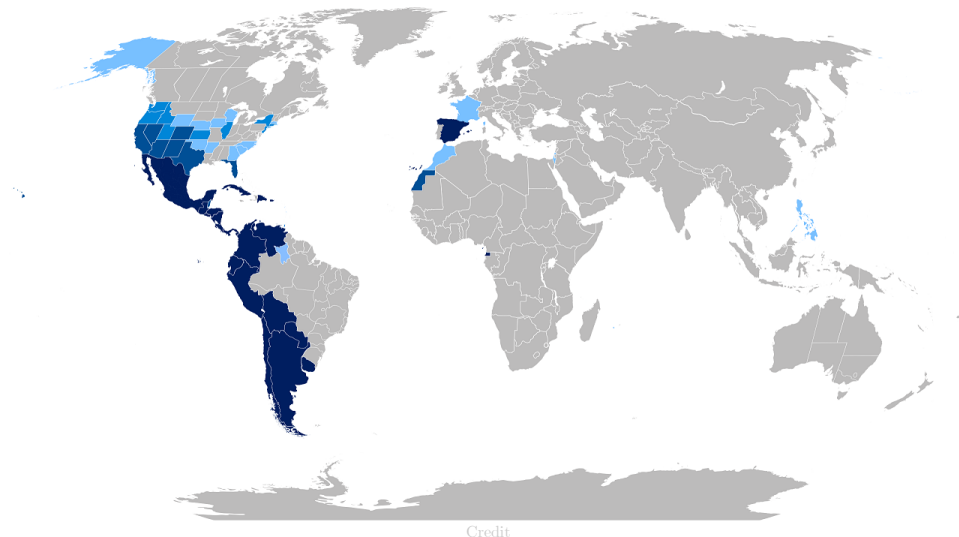


SPANISH

A Romance language that originated in the Iberian Peninsula of Europe. Today, it is a global

Appendix 7 - Languages

language with nearly 500 million native speakers, mainly in Spain and the Americas. It is the world's second-most spoken native language after Mandarin Chinese, and the world's fourth-most spoken language overall after English, Mandarin Chinese, and Hindi.



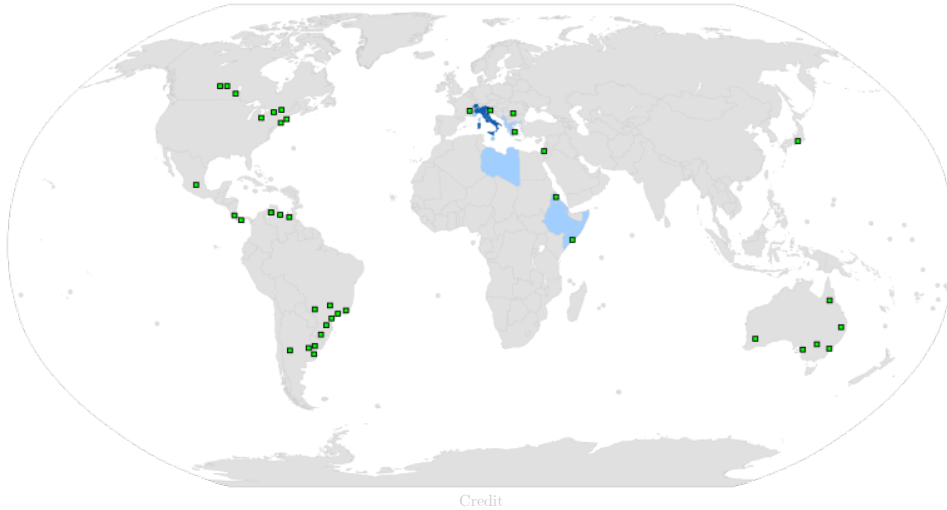
ITALIAN

A Romance language of the Indo-European language family. Italian is the closest national language to Latin, from which it descends via vulgar Latin of the Roman Empire. Taking into account both national and regional languages, it is seen that Italian and Sardinian are together the least differentiated from Latin. Italian is an official language in Italy, Switzerland (Ticino and the Grisons), San Marino, and Vatican City. It has an official minority status in western Istria (Croatia and Slovenia).

It formerly had official status in Albania, Malta, Monaco, Montenegro (Kotor), Greece (Ionian Islands and Dodecanese), and is generally understood in Corsica by Corsican speakers (many linguists classify Corsican as an Italian dialect). It used to be an official language in the former colonial areas of Italian East Africa and Italian North Africa, where it still has a significant role in various sectors.

Italian is also spoken by large immigrant and expatriate communities in the Americas and Australia. Italian is included under the languages covered by the European Charter for Regional or Minority languages in Bosnia and Herzegovina and in Romania, although Italian is neither a co-official nor a protected language in these countries. Many speakers of Italian are native bilinguals of both Italian (either in its standard form or regional varieties) and another regional language of Italy.

Appendix 7 - Languages



BRAZILIAN PORTUGUESE

The set of dialects of the Portuguese language native to Brazil and the most influential form of Portuguese worldwide. It is spoken by almost all of the 200 million inhabitants of Brazil and spoken widely across the Brazilian diaspora, today consisting of about two million Brazilians who have emigrated to other countries. With a population of over 205 million, Brazil is by far the world's largest Portuguese-speaking nation and the only one in the Americas.



PORTUGUESE

A Romance language originating in the Iberian Peninsula of Europe. It is the sole official language of Portugal, Angola, Moçambique, Guiné-Bissau, Cabo Verde, São Tomé and Príncipe, and Brazil,

Appendix 7 - Languages

while having co-official language status in East Timor, Equatorial Guinea, and Macau. A Portuguese-speaking person or nation is referred to as "Lusophone" (lusófono). As the result of expansion during colonial times, a cultural presence of Portuguese and Portuguese creole speakers are also found around the world. Portuguese is part of the Ibero-Romance group that evolved from several dialects of Vulgar Latin in the medieval Kingdom of Galicia and the County of Portugal, and has kept some Celtic phonology and its lexicon.



CATALAN

Catalan (/ˈkætələn, -æn, ˌkætəˈlæn/; autonym: català or llengua catalana; Eastern Catalan: [kətəˈla]), known in the Valencian Community and Carche as Valencian, is a Western Romance language derived from Vulgar Latin. It is the official language of Andorra, and a co-official language of three autonomous communities in eastern Spain: Catalonia, the Valencian Community and the Balearic Islands. It also has semi-official status in the Italian comune of Alghero. It is also spoken in the Pyrénées-Orientales department of France and in two further areas in eastern Spain: the eastern strip of Aragon and the Carche area in the Region of Murcia. The Catalan-speaking territories are often called the Països Catalans or "Catalan Countries".

The language evolved from Vulgar Latin in the Middle Ages around the eastern Pyrenees. Nineteenth-century Spain saw a Catalan literary revival, culminating in the early 1900s.

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WALLOON

A Romance language that is spoken in much of Wallonia and (to small extent) in Brussels, Belgium; some villages near Givet, northern France; a clutch of communities in northeastern Wisconsin, U.S.; and in some parts of Canada. It belongs to the langue d'oïl language family, the most prominent member of which is the French language. The historical background of its formation was the territorial extension since 980 of the Principality of Liège to the south and west.

Despite its rich literature, beginning anonymously in the 16th century and with well-known authors since 1756, the use of Walloon has decreased markedly since France's annexation of Wallonia in 1795. This period definitively established French as the language of social promotion, far more than it was before. After World War I, public schools provided French-speaking education to all children, inducing a denigration of Walloon, especially when accompanied by official orders in 1952 to punish its use in schools. Subsequently, since the middle of the 20th century, generational transmission of the language has decreased, resulting in Walloon almost becoming a dead language. Today it is scarcely spoken among younger people, with vast majority of its native speakers being the elderly (aged 65 and over). In 2007, the number of people with knowledge of the language was estimated at 600,000.

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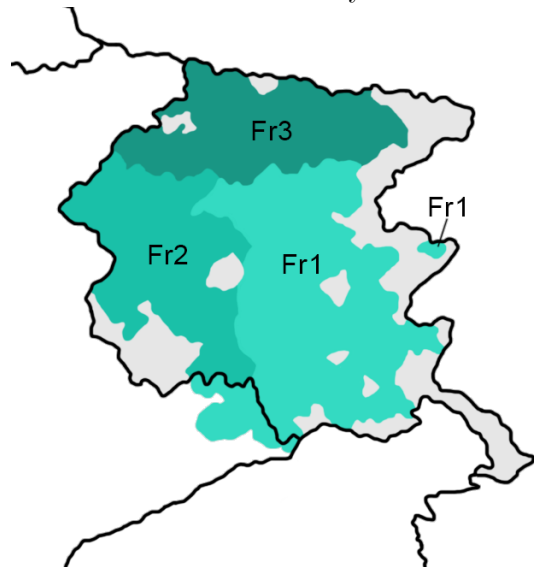


Credit

FRIULIAN

Friulian (/friˈuːliən/ free-00-lee-ən) or Friulan (natively About this soundfurlan or marilenghe; Italian: friulano; German: Furlanisch; Slovene: furlanščina) is a Romance language belonging to the Rhaeto-Romance family, spoken in the Friuli region of northeastern Italy. Friulian has around 600,000 speakers, the vast majority of whom also speak Italian.

It is sometimes called Eastern Ladin since it shares the same roots as Ladin, but over the centuries, it has diverged under the influence of surrounding languages, including German, Italian, Venetian, and Slovene. Documents in Friulian are attested from the 11th century and poetry and literature date as far back as 1300. By the 20th century, there was a revival of interest in the language.



Credit

Appendix 7 - Languages

ROMANIAN

Romanian (obsolete spellings: Rumanian or Roumanian; autonym: *limba română* ['limba ro'mîna] (About this soundlisten), or *românește*, lit. 'in Romanian') is a Balkan Romance language spoken by approximately 24–26 million people as a native language, primarily in Romania and Moldova, and by another 4 million people as a second language. According to another estimate, there are about 34 million people worldwide who can speak Romanian, of whom 30 million speak it as a native language. It is an official and national language of both Romania and Moldova and is one of the official languages of the European Union.

Romanian is a part of the Eastern Romance sub-branch of Romance languages, a linguistic group that evolved from several dialects of Vulgar Latin which separated from the Western Romance languages in the course of the period from the 5th to the 8th centuries. To distinguish it within the Eastern Romance languages, in comparative linguistics it is called Daco-Romanian as opposed to its closest relatives, Aromanian, Megleno-Romanian and Istro-Romanian. Romanian is also known as Moldovan in Moldova, although the Constitutional Court of Moldova ruled in 2013 that "the official language of the republic is Romanian".



Appendix 8 - Symbols

Ψ	Phylogeny The (possibly unknown) relationship between entities resulting from an evolutionary tree
τ	Tree topology Information on the relationships of the languages
μ	Substitution rate the rate at which the language changes
N	Sampled languages The number of languages in a sample
ν	Expected events The expected number of evolutionary events that occurred between two languages
t	Past times Times of branch events
B	Possible rooted trees
A	Segmental alignment Constructed by combining the word segment information for the languages of interest with information on the homology of the segments
S	Segmental information Information on the homology of the segments
s	Segment Linguistic segment
s_i	ith segment
H	Homology map The map describing the alignment of the segments
Q	Rate Matrix
β	Rate matrix scaling factor Scales the rate matrix such that the average rate of segmental substitution is one

Appendix 8 - Symbols

P	Probability The probability the process ends in certain state
<i>P</i>	Marginal Likelihood
π	Equilibrium distribution
λ	Rate of segment insertion
μ	Rate of segment deletion
<i>n</i>	Word length Number of segments in a word
<i>r</i>	Rate parameter
ϑ	Rate parameters Parameters associated with the rate matrix
ϑ'	Proposal New value proposal
<i>q</i>	Proposal probability Probability of new proposal
<i>u</i>	Random number
<i>R</i>	Acceptance probability Probability of accepting a proposed value
<i>M</i>	Model Mathematical model for linguistic parameters
<i>BF</i>	Bayes Factor A numerical factor related to the quality of the model fit
<i>X</i>	Unknown