## S2 Appendix. Pokémon key example

```
"$schema":
"https://raw.githubusercontent.com/WouterKoch/Clavis/main/Schema/Clavis.
  "title": "A key to a selection of Pokémon",
  "language": "en",
  "license": "https://creativecommons.org/licenses/by/4.0/",
  "creator": "person:wouterkoch",
  "lastModified": "2022-03-19 21:35:25",
  "identifier": "26b57071-15ca-4b44-92a4-b61181f15373",
  "persons": [
   {
      "id": "person:wouterkoch",
      "name": "Wouter Koch"
  "organizations": [
      "id": "organization:ntnu",
      "name": "Norwegian University of Science and Technology",
      "url": "https://www.ntnu.no"
   }
 ],
  "taxa": [
      "id": "taxon:pikachuidae",
      "scientificName": "Pikachuidae",
      "children": [
          "id": "taxon:pokemon_172",
          "scientificName": "Pichu",
          "children": [
              "id": "taxon:pokemon_172_standard",
              "label": ""
            },
              "id": "taxon:pokemon_172_shiny",
              "label": "Shiny"
        },
          "id": "taxon:pokemon_025",
          "scientificName": "Pikachu",
          "externalReference": [
```

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```
"serviceId": "service:wikidata",
          "externalId": "Q9351"
        },
          "serviceId": "service:example_api",
          "externalId": "Pikachu"
        }
      ],
      "followUp": "https://example.com/pikachu_costumes",
      "children": [
        {
          "id": "taxon:pokemon_025_standard",
          "isEndPoint": true,
          "label": "",
          "children": [
              "id": "taxon:pokemon_025_standard_male",
              "label": "ơ'"
            },
              "id": "taxon:pokemon_025_standard_female",
              "label": "Q"
          ]
        },
          "id": "taxon:pokemon_025_shiny",
          "label": "Shiny"
      ]
    },
      "id": "taxon:pokemon_026",
      "scientificName": "Raichu",
      "children": [
          "id": "taxon:pokemon_026_standard",
          "label": ""
        },
          "id": "taxon:pokemon_026_shiny",
          "label": "Shiny"
        }
      ]
    }
  ]
},
  "id": "taxon:pokemon_115",
  "scientificName": "Kangaskhan",
  "geography": {
```

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```
"polygon": [
      Γ
        130.0341796875,
            -10.228437266155943
          ],
          111.97265625,
            -21.779905342529634
          ],
          Γ
            115.09277343749999,
            -36.91476428895593
          ],
          131.2646484375,
            -32.916485347314385
          ],
          141.8994140625,
            -40.44694705960048
          ],
          Γ
            150.82031249999997,
            -38.8225909761771
          ],
          154.95117187499997,
            -26.15543796871355
          ],
          Γ
            142.3388671875,
            -10.09867012060338
          ],
          Γ
            138.69140625,
            -12.382928338487396
          ],
          130.0341796875,
            -10.228437266155943
        ]
      ]
    ]
  }
},
{
  "id": "taxon:castform",
  "scientificName": "Castform"
}
```

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```
],
                                                                                  151
"characters": [
                                                                                  152
                                                                                  153
    "id": "character:type_of_pokemon",
                                                                                  154
    "title": "Pokémon type",
                                                                                  155
    "states": [
                                                                                  156
                                                                                  157
         "id": "state:pokemon_type_electric",
         "title": "Electric"
                                                                                  159
                                                                                  160
    ]
                                                                                  161
  },
                                                                                  163
    "id": "character:color",
                                                                                  164
    "title": "Color of body",
                                                                                  165
    "states": [
                                                                                  166
       {
                                                                                  167
         "id": "state:color_blue",
                                                                                  168
         "title": "Blue"
      },
                                                                                  170
                                                                                  171
         "id": "state:color_red",
                                                                                  172
         "title": "Red"
                                                                                  174
    ]
  },
                                                                                  176
                                                                                  177
    "id": "character:all_colors",
                                                                                  178
    "title": "Colors on body of the Pokémon",
                                                                                  179
    "type": "non-exclusive",
                                                                                  180
    "states": [
       {
                                                                                  182
         "id": "state:colors_yellow",
                                                                                  183
         "title": "Yellow"
                                                                                  184
      },
                                                                                  185
       {
                                                                                  186
         "id": "state:colors_red",
                                                                                  187
         "title": "Red"
       },
                                                                                  189
         "id": "state:colors_black",
                                                                                  191
         "title": "Black"
      },
                                                                                  193
                                                                                  194
         "id": "state:colors_brown",
                                                                                  195
         "title": "Brown"
      },
                                                                                  197
         "id": "state:colors_white",
                                                                                  199
         "title": "White"
                                                                                  200
       }
                                                                                  201
    ]
                                                                                  202
```

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```
},
                                                                               203
                                                                               204
  "id": "character:tail_shape",
                                                                               205
  "title": "Shape of the tail end",
                                                                               206
  "states": [
                                                                               207
                                                                               208
       "id": "state:pointy_tail",
                                                                               209
       "title": "Pointy",
       "media": "media:pointy_tail"
                                                                               211
    },
                                                                               212
                                                                               213
       "id": "state:lobed_tail",
       "title": "Double-lobed",
                                                                               215
       "media": "media:lobed_tail"
                                                                               216
                                                                               217
  ]
                                                                               218
},
                                                                               219
{
                                                                               220
  "id": "character:wearing_hat",
                                                                               221
  "title": "Is the Pokémon wearing a hat?",
                                                                               222
  "states": [
                                                                               223
    {
                                                                               224
       "id": "state:hat",
       "title": "Yes"
                                                                               226
    },
                                                                               228
       "id": "state:no_hat",
       "title": "No"
                                                                               230
    }
  ٦
                                                                               232
},
                                                                               234
  "id": "character:hat_shape",
                                                                               235
  "title": "What is the style of the hat?",
                                                                               236
  "logicalPremise": "state:hat",
                                                                               237
  "states": [
                                                                               238
                                                                               239
       "id": "state:bowler_hat",
                                                                               240
       "title": "Bowler hat"
                                                                               241
    },
                                                                               242
                                                                               243
       "id": "state:top_hat",
       "title": "Top hat"
                                                                               245
    }
                                                                               246
  ]
                                                                               247
},
                                                                               249
  "id": "character:weight",
  "title": "How much does the Pokémon weigh?",
                                                                               251
  "userRequirement": "requirement:catch",
  "type": "numerical",
                                                                               253
```

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"states": {

```
"id": "state:weight",
      "min": 1,
      "max": 125,
      "stepSize": 1,
      "unit": "kg"
    }
  }
],
"statements": [
  {
    "id": "statement:pikachu_is_electric",
    "taxon": "taxon:pokemon_025",
    "character": "character:type_of_pokemon",
    "value": "state:pokemon_type_electric",
    "frequency": 1
  },
  {
    "id": "statement:pikachu_is_never_blue",
    "taxon": "taxon:pokemon_025",
    "character": "character:color",
    "value": "state:color_blue",
    "frequency": 0
  },
    "id": "statement:pikachu_lobed_tail",
    "taxon": "taxon:pokemon_025",
    "character": "character:tail_shape",
    "value": "state:lobed_tail",
    "frequency": 0.5
  },
    "id": "statement:pikachu_pointy_tail",
    "taxon": "taxon:pokemon_025",
    "character": "character:tail_shape",
    "value": "state:pointy_tail",
    "frequency": 0.5
  },
  {
    "id": "statement:pikachu_weight",
    "taxon": "taxon:pokemon_025",
    "character": "character:weight",
    "value": [
      2.98,
      10.1
    ],
    "frequency": 1
  },
    "id": "statement:castform_rain_type",
    "taxon": "taxon:castform",
    "character": "character:castform_type",
    "value": "state:rainy_castform",
```

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```
"frequency": 0.2
},
{
  "id": "statement:castform_rain_type_bergen",
  "taxon": "taxon:castform",
  "character": "character:castform_type",
  "value": "state:rainy_castform",
  "frequency": 0.9,
  "geography": {
    "polygon": [
      5.27618408203125,
            60.44976847885747
          ],
          Γ
            5.218505859375,
            60.4233434866285
          ],
          Γ
            5.27618408203125,
            60.36160157353732
          ],
          5.395660400390625,
            60.36839212633114
          ],
          Γ
            5.4052734375,
            60.421309904895715
          ],
          5.27618408203125,
            60.44976847885747
          ٦
        ]
      ]
    ]
 }
},
  "id": "statement:pikachu_contains_yellow",
  "taxon": "taxon:pokemon_025",
  "character": "character:all_colors",
  "value": "state:colors_yellow",
  "frequency": 1
},
{
  "id": "statement:pikachu_contains_black",
  "taxon": "taxon:pokemon_025",
  "character": "character:all_colors",
```

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```
"value": "state:colors_black",
                                                                           359
  "frequency": 1
                                                                           360
},
                                                                           361
  "id": "statement:pikachu_contains_red",
                                                                           363
  "taxon": "taxon:pokemon_025",
  "character": "character:all_colors",
                                                                           365
  "value": "state:colors_red",
  "frequency": 1
                                                                           367
},
  "id": "statement:pikachu_contains_no_brown",
  "taxon": "taxon:pokemon_025",
                                                                           371
  "character": "character:all_colors",
  "value": "state:colors_brown",
                                                                           373
  "frequency": 0
},
                                                                           375
{
                                                                           376
  "id": "statement:pikachu_contains_no_white",
                                                                           377
  "taxon": "taxon:pokemon_025",
                                                                           378
  "character": "character:all_colors",
                                                                           379
  "value": "state:colors_white",
                                                                           380
  "frequency": 0
},
                                                                           382
  "id": "statement:raichu_contains_yellow",
                                                                           384
  "taxon": "taxon:pokemon_026",
  "character": "character:all_colors",
                                                                           386
  "value": "state:colors_yellow",
  "frequency": 1
                                                                           388
},
                                                                           390
  "id": "statement:raichu_contains_no_black",
                                                                           391
  "taxon": "taxon:pokemon_026",
                                                                           392
  "character": "character:all_colors",
                                                                           393
  "value": "state:colors_black",
                                                                           394
  "frequency": 0
                                                                           395
},
                                                                           397
  "id": "statement:raichu_contains_no_red",
  "taxon": "taxon:pokemon_026",
                                                                           399
  "character": "character:all_colors",
  "value": "state:colors_red",
                                                                           401
  "frequency": 0
},
                                                                           403
  "id": "statement:raichu contain brown".
                                                                           405
  "taxon": "taxon:pokemon_026",
  "character": "character:all_colors",
                                                                           407
  "value": "state:colors_brown",
  "frequency": 1
                                                                           409
},
                                                                           410
```

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```
411
      "id": "statement:raichu_contains_white",
                                                                               412
      "taxon": "taxon:pokemon_026",
                                                                               413
      "character": "character:all_colors",
                                                                               414
      "value": "state:colors_white",
                                                                               415
      "frequency": 1
                                                                               416
    }
                                                                               417
  ],
  "userRequirements": [
                                                                               419
    {
                                                                               420
      "id": "requirement:catch",
                                                                               421
      "title": "Catching required",
      "warning": "To answer this, you have to catch the Pokémon
                                                                               423
first.",
      "description": "1. Select a pokéball color.\\n2. Hold the ball,
                                                                               425
spinning it a few times. \\n3. Fling the pokéball towards the Pokémon,
adjusting for the curveball generated from spinning the ball. \\n4. Try
to hit the circle when it is at its smallest.",
                                                                               428
      "descriptionUrl":
"https://niantic.helpshift.com/hc/en/6-pokemon-go/faq/102-finding-catchi 430
ng-wild-pokemon/"
    }
                                                                               432
  ],
  "externalServices": [
                                                                               434
      "id": "service:wikidata",
      "title": "Wikidata",
                                                                               437
      "url": "https://www.wikidata.org/w/api.php"
                                                                               438
    },
                                                                               440
      "id": "service:example_api",
      "title": "Example",
                                                                               442
      "description": "Gives the probability for a taxon, given its
                                                                               443
weight and location.",
      "url": "https://api.example.com"
                                                                               445
    }
                                                                               446
  ],
                                                                               447
  "mediaElements": [
                                                                               449
      "id": "media:pointy_tail",
      "mediaElement": {
                                                                               451
        "file": [
          {
                                                                               453
             "url":
"https://github.com/WouterKoch/Clavis/raw/main/Keys/Images/pointy_100.pn 455
g",
             "width": 100.
                                                                               457
             "height": 100,
             "license": "https://creativecommons.org/licenses/by/4.0/",
             "creator": "person:wouterkoch"
                                                                               460
          },
                                                                               461
          {
                                                                               462
```

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```
"url":
"https://github.com/WouterKoch/Clavis/raw/main/Keys/Images/pointy_250.pn 464
g",
             "width": 250,
             "height": 250,
                                                                                467
             "license": "https://creativecommons.org/licenses/by/4.0/",
                                                                                468
             "creator": "person:wouterkoch"
                                                                                469
          }
        ]
                                                                                471
      }
                                                                                472
    },
                                                                                473
      "id": "media:lobed_tail",
                                                                                475
      "mediaElement": {
                                                                                476
        "file": [
                                                                                477
                                                                                478
             "url":
"https://github.com/WouterKoch/Clavis/raw/main/Keys/Images/lobed_100.png 480
             "width": 100,
                                                                                482
             "height": 100,
                                                                                483
             "license": "https://creativecommons.org/licenses/by/4.0/",
                                                                                484
             "creator": "person:wouterkoch"
          },
                                                                                486
                                                                                487
             "url":
"https://github.com/WouterKoch/Clavis/raw/main/Keys/Images/lobed_250.png 489
             "width": 250,
             "height": 250,
                                                                                492
             "license": "https://creativecommons.org/licenses/by/4.0/",
             "creator": "person:wouterkoch"
                                                                                494
                                                                                495
        ]
      }
                                                                                497
    }
                                                                                498
 ]
                                                                                499
}
                                                                                501
```

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