Implementiere eine Anwendung für die regelbasierte Textanalyse von Arztbriefen.

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| **Eingabe** | Textdokument (z.B. Arztbrief) |
| **Ausgabe** | Patienteninformationen, z.B. Name, Gewicht, Alter, Geschlecht, Größe, etc. des Patienten |

Beispielregel für Gewicht:

weight\_rule = {

    'regex': "\\b(\\d{1,3}(\\.\\d)?(((kg)|(#|lb))s?)?(1?\\doz)?|[0-2]\\d{3})\\b",

    'prefix': ["weighs", "weighed", "weight"],

    'suffix': ["pounds", "lbs", "lb", "#", "#s", "kg", "kgs", "oz",

               "kilograms", "kilos", "ounces"],

    'contextLength': 15,

    'contextException': ["gain", "g", "gram", "grams",

                         "mg", "milligram", "milligrams",

                         "BMI", "gain", "gains", "gained", "gaining",

                         "lose", "lost", "loses", "losing",

                         "temperature", "pulse", "height"],

    'exceptionDistance': 25

}

**Aufgabe**

1. Entwickle 1 - 2 zusätzliche Regeln, z.B. für die Extraktion von Alter, Temperatur oder Geschlecht, analog zu der Regel oben.
2. Implementiere eine einfache Command Line Application, die für ein Dokument die enthaltenen Patienteninformationen ausgibt. Stelle dabei die implementierte Funktionalität über Tests sicher.
3. Wende die Anwendung auf Datenströme an (kontinuierlicher Datenstrom von Arztbriefen). Integriere dafür die Anwendung in Apache Kafka (lokales Setup): Konsumiere die Arztbriefe aus einer Kafka-Topic und schreibe die Ergebnisse strukturiert in eine zweite Kafka-Topic. Stelle dabei sicher, dass Deine Lösung auch skaliert.

Beispieldaten

**(1)** On examination today, this is a pleasant and healthy appearing woman. VITAL SIGNS: Blood pressure 154/72, heart rate 87, temperature 98.8, and weight 153 pounds. Pain is 0/10. HEAD: Head is normocephalic and atraumatic. Head circumference is 54 cm, which is in the 10-25th percentile for a woman who is 5 foot and 6 inches tall and 153 lbs.

**(2)** GENERAL: She is a pleasant elderly woman, currently in no acute distress. VITAL SIGNS: Height 4 feet 11 inches, weight 128 pounds, temperature 97.2 degrees Fahrenheit, blood pressure 142/70, pulse 47, respiratory rate 16, and O2 saturation 100%

**(3)** On examination today, this is a pleasant 81-year-old man who is brought back from the clinic waiting area in a wheelchair. He is well developed, well nourished, and kempt. Vital Signs: Temperature 96.7, pulse 62, respirations 16, blood pressure 123/71, and weight 184. Head: The head is normocephalic and atraumatic.

**(4)** The baby is an ex-32 weeks small for gestational age infant with birth weight 1102. Baby was born at ABCD Hospital at 1333 on 07/14/2006. Mother is a 20-year-old gravida 1, para 0 female who received prenatal care. Prenatal course was complicated by low amniotic fluid index and hypertension. She was evaluated for evolving preeclampsia and had a C-section secondary to the nonreassuring fetal status. Baby delivered operatively, Apgar scores were 8 and 9 initially taken to level 2 satellite nursery and arrangements were to transfer to Children's Hospital. Infant was transferred to Children's Hospital for higher level of care, stayed at Children's Hospital for approximately 2 weeks, and was transferred back to ABCD where he stayed until he was discharged on 08/16/2006.

**(5)** SOCIAL HISTORY: The patient lives at home with 23-year-old mother, who is a homemaker and 24-year-old father, John, who is a supervisor at Excel. The family lives in Bentley, Kansas. No smoking in the home. Family does have one pet cat. REVIEW OF SYSTEMS: As per HPI, otherwise, negative. OBJECTIVE: Weight: 7 pounds 12 ounces. Height: 21 inches. Head circumference: 35 cm. Temperature: 97.2 degrees. Pulse: 64 beats per minute. Blood pressure 104/63. General: Well-developed, well-nourished, cooperative, alert, interactive 2-week-old white female in no acute distress. Temperature is significantly down from 101.2 degrees two days ago

**(6)** I had the pleasure of meeting Ms. ABC for evaluation for bariatric surgery. As you know

she is a pleasant 54-year-old female who has multiple medical problems and is seeking evaluation for laparoscopic gastric banding. I saw her on October 3, 2008 in the office after she had attended a Fairfield County Bariatrics and Surgical Specialists seminar. she is 5'7 " and weighs 242 pounds. she has been overweight since age 27. she is now at her highest adult weight.

**(7)** In short, the patient is a 55-year-old gentleman with long-standing morbid obesity, resistant to nonsurgical methods of weight loss with BMI of 69.7 with comorbidities of hypertension, atrial fibrillation, hyperlipidemia, possible sleep apnea, and also osteoarthritis of the lower extremities. On physical examination today, he weighs 514.8 pounds, he has gained 21 pounds since the last visit with us. his pulse is 78, temperature is 97.5, blood pressure is 132/74.