

A second opinion

Lexical AI for Patient-Centered Clinical Diagnoses



Why?

The Diagnostic Procedure

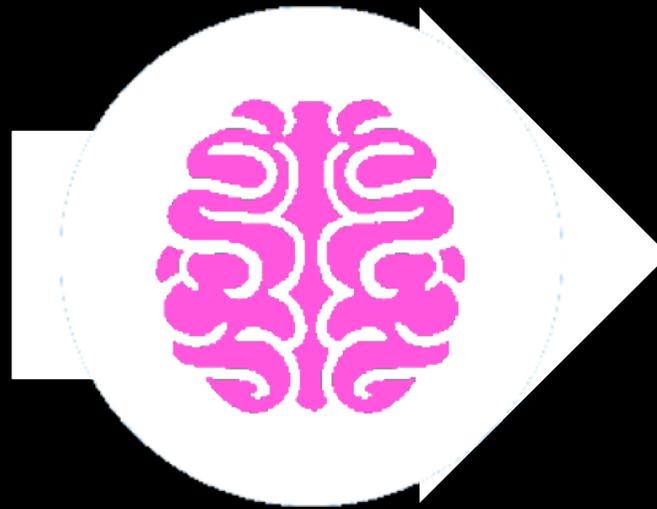
Inputs:

Perceived Symptoms

Patient Chart

Biometrics

Human interpretation of
medical models



Outputs:

Prescription(s)

Lifestyle

Recommendations

The Lexical AI Procedure

Inputs:

Explained Symptoms

Patient Chart

Allergies

Biometrics

Medical Models

Patient History

Sync4Science Data

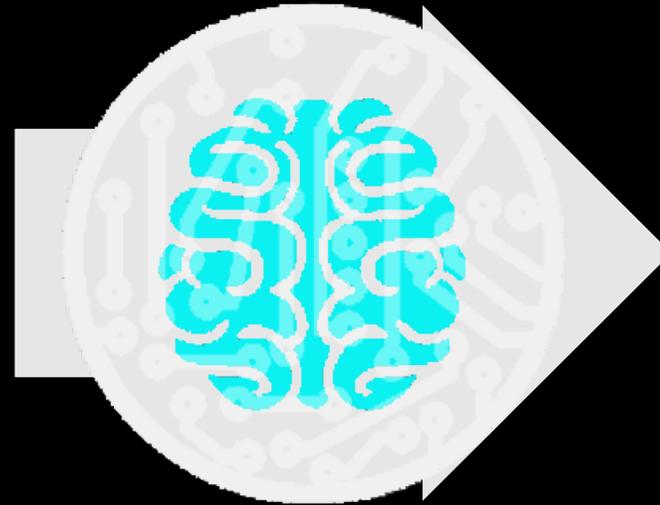
Public medical databases

Immediate recommendations

All current prescriptions

Family medical history

Genetic predispositions



Outputs:

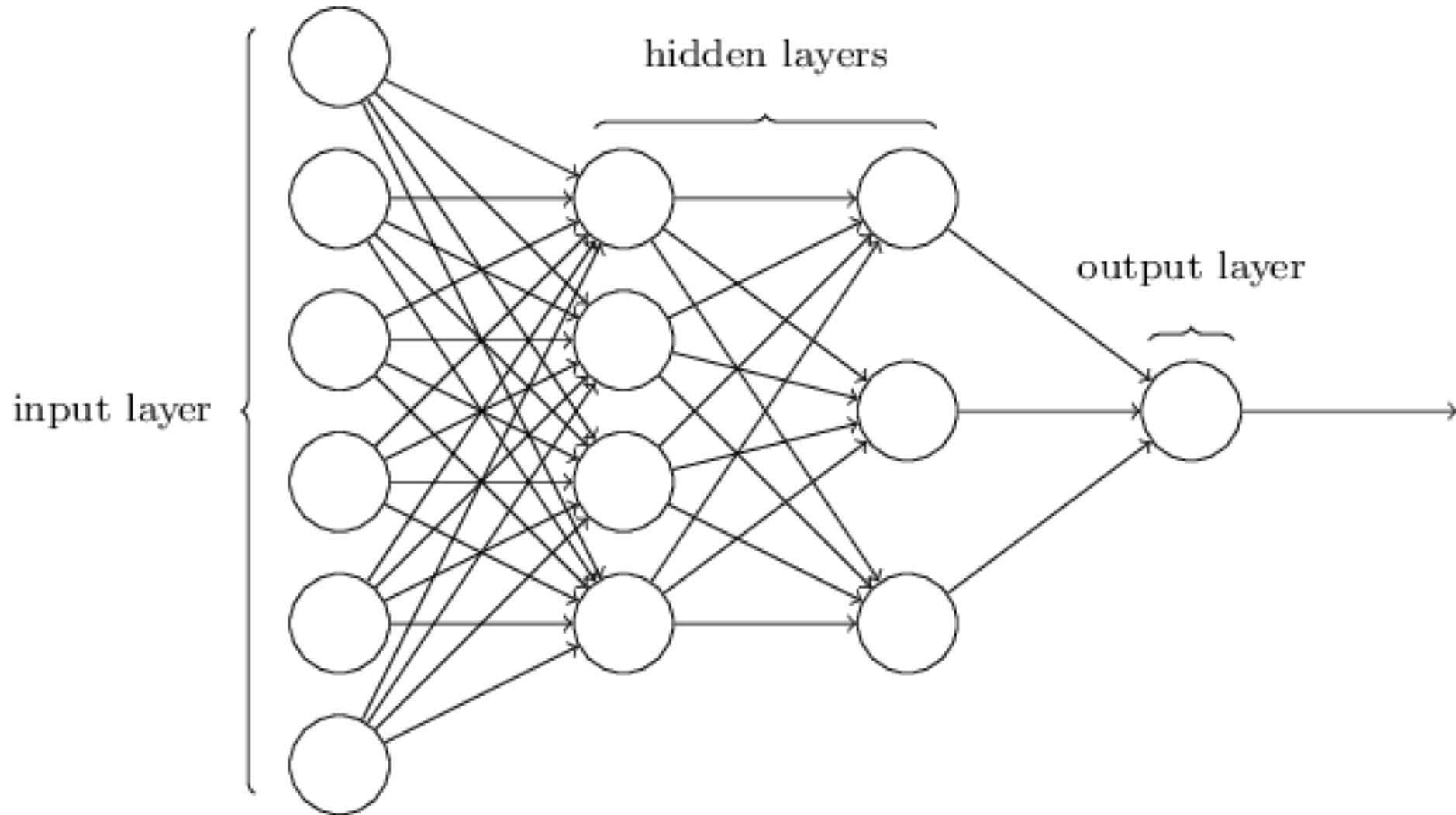
Prescription(s)

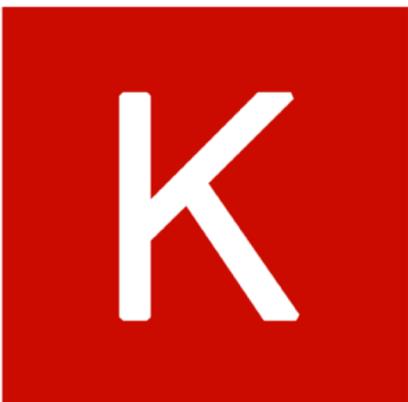
Lifestyle Recommendations

Post-examination feedback

Concepts

Artificial Thought



K

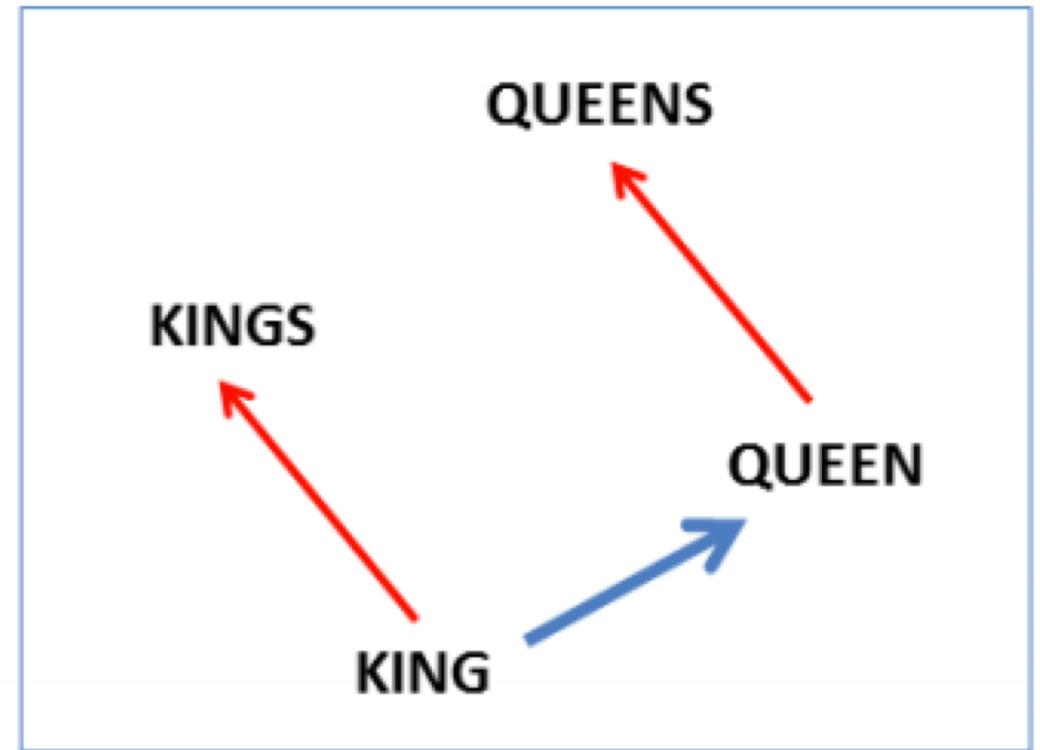
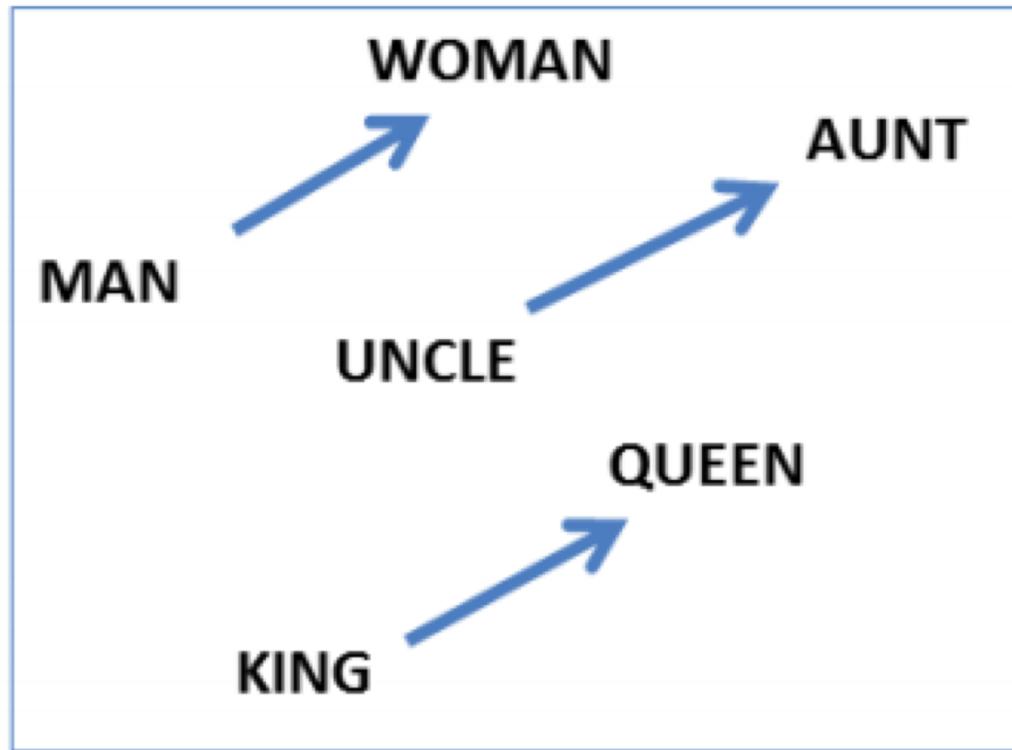
Keras

```
input_encoder = Sequential()
input_encoder.add(Embedding(input_dim=vocab_size, output_dim=64))
input_encoder.add(LSTM(64))

question_encoder = Sequential()
question_encoder.add(Embedding(input_dim=vocab_size, output_dim=64))
question_encoder.add(LSTM(64))

model = Sequential()
model.add(Merge([input_encoder, question_encoder], mode='concat'))
model.add(Dense(128))
model.add(Activation('softmax'))
```

Word Vectorization



(Mikolov et al., NAACL HLT, 2013)

Patient Data



SMART

Employing Past Work



You don't seem to be connected to an EHR! [Learn how here.](#)

BRAF V600E 673 chr7:g.140453136A>T

Gene

[Variant](#)

[Clinical Trials](#)

BRAF

B-Raf proto-oncogene, serine/threonine kinase

Gene Description

This gene encodes a protein belonging to the RAF family of serine/threonine protein kinases. This protein plays a role in regulating the MAP kinase/ERK signaling pathway, which affects cell division, differentiation, and secretion. Mutations in this gene, most commonly the V600E mutation, are the most frequently identified cancer-causing mutations in melanoma, and have been identified in various other cancers as well, including non-Hodgkin lymphoma, colorectal cancer, thyroid carcinoma, non-small cell lung carcinoma, hairy cell leukemia and adenocarcinoma of lung. Mutations in this gene are also associated with cardiofaciocutaneous, Noonan, and Costello syndromes, which exhibit overlapping phenotypes. A pseudogene of this gene has been identified on the X chromosome. [provided by RefSeq, Aug 2017].

Gene Pathways

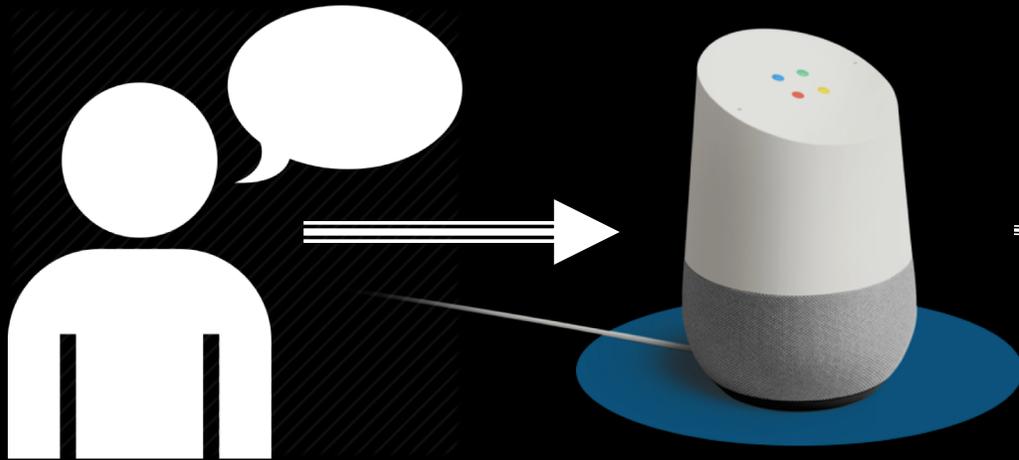
Gene Details

Entrez ID	673
Type	protein-coding
Aliases	B-RAF1, B-NS7, RAFB
Chromosome	7



Cohesion

Lexical Flow

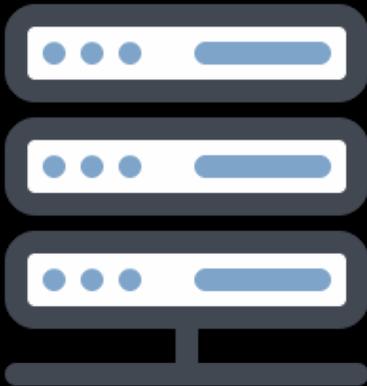
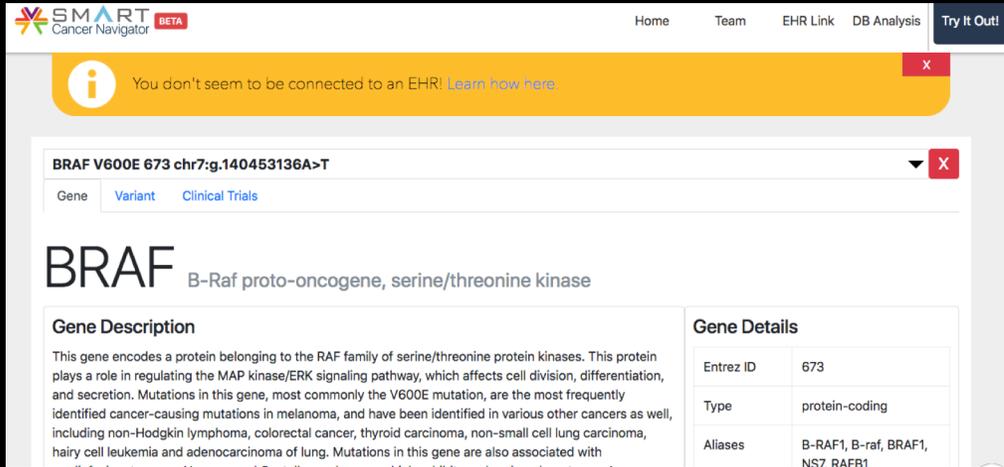


Interpretation of Symptoms
Wrist pain, hypertension, nausea

Interpretation of Sentiment
*Hurts badly, mild annoyance,
frustrating cough*

Patient Data Cross-Reference
*Current prescription is known to rarely
induce anxiety attacks, family history
of sodium deficiency*

GUI Flow



Genomic Databases
MyCancerGenome, CIVIC, dgiDB

Clinical Trial Databases
Relevant clinical trials might be useful as a further extension of our work, given that we can cross-reference patients' symptoms with available trials.

FHIR Reference
Patient-relevant data and SMART CDS hooks return responses



Thanks!
Any Questions?