

# DSDHT Assignment: Module\_3, Healthcare metadata

## Ontologies and Protégé

1. Download and install Protégé from <http://protege.stanford.edu/>. Protégé is a "free, open-source ontology editor and framework for building intelligent systems". Protégé can be used to browse and explore ontologies, which is the overall task in this assignment.
2. Download the latest DBPedia ontology in OWL format, from <http://wiki.dbpedia.org>. "DBpedia is a crowd-sourced community effort to extract structured information from Wikipedia and make this information available on the Web." Load the ontology into Protégé.
3. How many classes and axioms are in the ontology? In general an axiom is any assertion about a class, such as a SubClassOf relationship. Describe at least one class and one axiom in your report, with illustrative screen shots.
4. One DBPedia class relevant to health informatics is "disease" with URI <http://dbpedia.org/ontology/Disease>. Go to the DBPedia Sparql endpoint <http://dbpedia.org/sparql> and run the Sparql query below. How many diseases are found?

```
SELECT DISTINCT ?d
WHERE { ?d a <http://dbpedia.org/ontology/Disease> }
```

5. Each disease found should correspond with a Wikipedia "Infobox". Confirm this is true for a few diseases. Describe the role of the DBPedia ontology relative to DBPedia and Wikipedia.

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Grading rubric:

Task	Points
1	20
2	20
3	20
4	20
5	20
TOTAL	100

---

Example output:

dbo (http://dbpedia.org/ontology/) : [/Users/jiyang/Downloads/dbpedia\_2016-04.owl]

Active Ontology x Entities x Individuals by class x

Ontology header: **Ontology IRI** http://dbpedia.org/ontology/ **Ontology Version IRI** e.g. http://dbpedia.org/ontology/1.0.0

Annotations +

source <http://mappings.dbpedia.org>

license <http://creativecommons.org/licenses/by-sa/3.0/>

title [language: en] The DBpedia Ontology

publisher DBpedia Maintainers

homepage <http://wiki.dbpedia.org/Ontology>

modified 2016-05-21T19:13Z

Ontology metrics:

Metrics

Axiom	27851
Logical axiom count	7170
Class count	1158
Object property count	1142
Data property count	1754
Individual count	1
DL expressivity	ALCHFD

Class axioms

SubClassOf axioms count	763
EquivalentClasses axioms count	410
DisjointClasses axioms count	25
GCI count	0
Hidden GCI Count	360

Object property axioms

SubObjectPropertyOf axioms count	922
----------------------------------	-----

Ontology imports | Ontology Prefixes | General class axioms

Imported ontologies:

Direct Imports +

Indirect Imports

No Reasoner set. Select a reasoner from the Reasoner menu ☒ Show Inferences

Virtuoso SPARQL Query Editor

About | Namespace Prefixes | Inference rules | SPARQL

Default Data Set Name (Graph IRI)

Query Text

```
select distinct ?d where {?d a <http://dbpedia.org/ontology/Disease> }
```

(Security restrictions of this server do not allow you to retrieve remote RDF data, see [details](#).)

Results Format:

Execution timeout:  milliseconds (values less than 1000 are ignored)

Options: ☒ Strict checking of void variables ☐ Log debug info at the end of output (has no effect on some queries and output formats)

(The result can only be sent back to browser, not saved on the server, see [details](#))

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Virtuoso version 07.20.3217 on Linux (686-generic-linux-glibc212-64), Single Server Edition

**d**

<a href="http://dbpedia.org/resource/Abortion">http://dbpedia.org/resource/Abortion</a>
<a href="http://dbpedia.org/resource/Abscess">http://dbpedia.org/resource/Abscess</a>
<a href="http://dbpedia.org/resource/Acute_disseminated_encephalomyelitis">http://dbpedia.org/resource/Acute_disseminated_encephalomyelitis</a>
<a href="http://dbpedia.org/resource/Alcohol_intoxication">http://dbpedia.org/resource/Alcohol_intoxication</a>
<a href="http://dbpedia.org/resource/Amputation">http://dbpedia.org/resource/Amputation</a>
<a href="http://dbpedia.org/resource/Aphasia">http://dbpedia.org/resource/Aphasia</a>
<a href="http://dbpedia.org/resource/Arteriovenous_malformation">http://dbpedia.org/resource/Arteriovenous_malformation</a>
<a href="http://dbpedia.org/resource/Arthritis">http://dbpedia.org/resource/Arthritis</a>
<a href="http://dbpedia.org/resource/Bacterial_vaginosis">http://dbpedia.org/resource/Bacterial_vaginosis</a>
<a href="http://dbpedia.org/resource/Bipolar_I_disorder">http://dbpedia.org/resource/Bipolar_I_disorder</a>
<a href="http://dbpedia.org/resource/Brain_abscess">http://dbpedia.org/resource/Brain_abscess</a>
<a href="http://dbpedia.org/resource/Candidiasis">http://dbpedia.org/resource/Candidiasis</a>
<a href="http://dbpedia.org/resource/Catatonia">http://dbpedia.org/resource/Catatonia</a>
<a href="http://dbpedia.org/resource/Central_pontine_myelinolysis">http://dbpedia.org/resource/Central_pontine_myelinolysis</a>
<a href="http://dbpedia.org/resource/Cerebral_arteriovenous_malformation">http://dbpedia.org/resource/Cerebral_arteriovenous_malformation</a>
<a href="http://dbpedia.org/resource/Chagas_disease">http://dbpedia.org/resource/Chagas_disease</a>
<a href="http://dbpedia.org/resource/Chlamydia_infection">http://dbpedia.org/resource/Chlamydia_infection</a>
<a href="http://dbpedia.org/resource/Cholera">http://dbpedia.org/resource/Cholera</a>
<a href="http://dbpedia.org/resource/Cretinism">http://dbpedia.org/resource/Cretinism</a>
<a href="http://dbpedia.org/resource/Endocarditis">http://dbpedia.org/resource/Endocarditis</a>
<a href="http://dbpedia.org/resource/Erectile_dysfunction">http://dbpedia.org/resource/Erectile_dysfunction</a>
<a href="http://dbpedia.org/resource/Essential_tremor">http://dbpedia.org/resource/Essential_tremor</a>
<a href="http://dbpedia.org/resource/Expressive_aphasia">http://dbpedia.org/resource/Expressive_aphasia</a>
<a href="http://dbpedia.org/resource/Foix-Alajouanine_syndrome">http://dbpedia.org/resource/Foix-Alajouanine_syndrome</a>
<a href="http://dbpedia.org/resource/Fugue_state">http://dbpedia.org/resource/Fugue_state</a>
<a href="http://dbpedia.org/resource/Genetic_disorder">http://dbpedia.org/resource/Genetic_disorder</a>
<a href="http://dbpedia.org/resource/Hemiparesis">http://dbpedia.org/resource/Hemiparesis</a>



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# Diabetes mellitus

From Wikipedia, the free encyclopedia

*"Diabetes" redirects here. For other uses, see [Diabetes \(disambiguation\)](#).*

**Diabetes mellitus** (**DM**), commonly referred to as **diabetes**, is a group of [metabolic diseases](#) in which there are high blood sugar levels over a prolonged period.<sup>[2]</sup> Symptoms of high blood sugar include frequent urination, increased thirst, and increased hunger. If left untreated, diabetes can cause many complications.<sup>[3]</sup> **Acute** complications can include [diabetic ketoacidosis](#), [nonketotic hyperosmolar coma](#), or death.<sup>[4]</sup> Serious long-term complications include [heart disease](#), [stroke](#), [chronic kidney failure](#), [foot ulcers](#), and [damage to the eyes](#).<sup>[3]</sup>

Diabetes is due to either the [pancreas](#) not producing enough [insulin](#) or the cells of the body not responding properly to the insulin produced.<sup>[5]</sup> There are three main types of diabetes mellitus:

- **Type 1 DM** results from the pancreas's failure to produce enough insulin. This form was previously referred to as "insulin-dependent diabetes mellitus" (IDDM) or "juvenile diabetes". The cause is unknown.<sup>[3]</sup>
- **Type 2 DM** begins with [insulin resistance](#), a condition in which cells fail to respond to insulin properly.<sup>[3]</sup> As the disease progresses a lack of insulin may also develop.<sup>[6]</sup> This form was previously referred to as "non insulin-dependent diabetes mellitus" (NIDDM) or "adult-onset diabetes". The most common cause is excessive body weight and not enough exercise.<sup>[3]</sup>
- **Gestational diabetes** is the third main form and occurs when pregnant women without a previous history of diabetes develop high blood-sugar levels.<sup>[3]</sup>

Prevention and treatment involve maintaining a healthy diet, regular physical exercise, a normal body weight, and avoiding use of tobacco. Control of blood pressure and maintaining proper foot care are important for people with the disease. Type 1 DM must be managed with insulin injections.<sup>[3]</sup> Type 2 DM may be treated with medications with or without insulin.<sup>[7]</sup> Insulin and some oral medications can cause [low blood sugar](#).<sup>[8]</sup> **Weight loss surgery** in those with [obesity](#) is sometimes an effective measure in those with type 2 DM.<sup>[9]</sup> Gestational diabetes usually resolves after the birth of the baby.<sup>[10]</sup>

As of 2015, an estimated 415 million people had diabetes worldwide,<sup>[11]</sup> with type 2 DM making up about 90% of the cases.<sup>[12][13]</sup> This represents 8.3% of the adult population,<sup>[13]</sup> with equal rates in both women and men.<sup>[14]</sup> As of 2014, trends suggested the rate would continue to rise.<sup>[15]</sup> Diabetes at least doubles a person's risk of early death.<sup>[3]</sup> From 2012 to 2015, approximately 1.5 to 5.0 million deaths each year resulted from diabetes.<sup>[7][11]</sup> The

Diabetes mellitus

Universal blue circle symbol for diabetes.<sup>[11]</sup>

Classification and external resources

<b>Specialty</b>	Endocrinology
<b>ICD-10</b>	E10 –E14
<b>ICD-9-CM</b>	250
<b>MedlinePlus</b>	001214
<b>eMedicine</b>	med/546  emerg/134
<b>Patient UK</b>	Diabetes mellitus
<b>MeSH</b>	C18.452.394.750

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