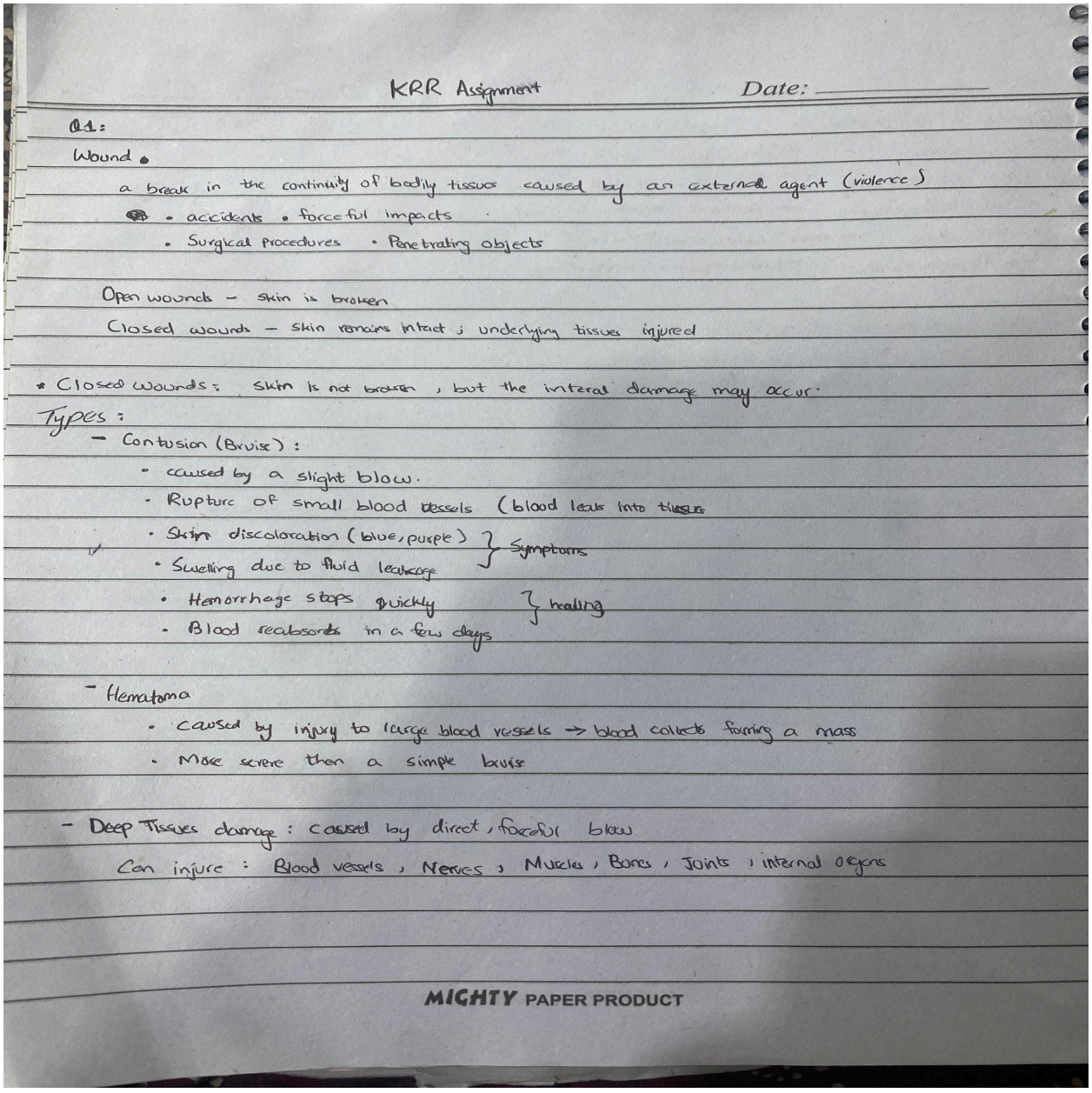
Resources used:

Intro to Ontology - YouTube
Ontology Development 101: A Guide to Creating Your First Ontology
A Practical Introduction to Protégé OWL
Ontology Practice - Build pizza.owl in Protégé - YouTube
ProtegeReasonerPlugin - Protege Wiki
Deep Dive: Creating Your First Ontology
https://youtube.com/playlist?list=PLIHlyoU28t59kTr-0dDS6S_____clDkCfXHy_&si=YxrVDNqCVralRs-v
Knowledge Graphs in one Video! It is Trending by Why?? Eveything you need to k…
An Introduction to Knowledge Graphs | SAIL Blog
AI Explained - Knowledge Graphs | Turning Raw Data Into Useful Information
https://chatgpt.com/share/69229311-5a94-8005-b37a-a8c805e7df31

Question 1: Ontology - Wounds



KRR Assignment Date: _____

Q1:

Wound •

a break in the continuity of bodily tissues caused by an external agent (violence)

• accidents • forceful impacts

• Surgical procedures • Penetrating objects

Open wounds – skin is broken

Closed wounds – skin remains intact ; underlying tissues injured

* Closed wounds: skin is not broken , but the interal damage may occur.

Types :

– Contusion (Bruise) :

- caused by a slight blow.
- Rupture of small blood vessels (blood leak into tissues
- Skin discoloration (blue, purple) } Symptoms
- Swelling due to fluid leakage
- Hemorrhage stops quickly } healing
- Blood reabsorbs in a few days

– Hematoma

- caused by injury to large blood vessels → blood collects forming a mass
- More severe than a simple bruise

– Deep Tissues damage : caused by direct , forceful blow

Can injure : Blood vessels , Nerves , Muscles , Bones , Joints , internal Organs

MIGHTY PAPER PRODUCT

- Indirect injuries
  - Twisted injuries → sprains, broken ankle / leg / hip
  - Bending injuries
  - Deceleration injuries – common in car, aircraft accidents → cause whiplash (head snaps)

- Fall on outstretched hand
  - Force may fracture scaphoid (wrist), Radius (forearm), Elbow, Shoulder
  - The breaking point depends on force direction + anatomy

★ Open Wounds : make breaks in skin or mucous membrane
risk of contamination and infection
- Entry of bacteria, dirt
- Exposure to air dries tissues and increases tissue damage
- serious if joint, nerve, vessel or organ is damaged

Skins → heals well (elastic, well vascularized)
Fat tissue → delicate, easily deprived of blood
Muscle → tears easily (dies quickly without blood) prone to infection
Bone → dangerous if exposed, fragments can die and act as foreign bodies

★ Bacterial & Non Bacterial Contamination
most ~~Dangerous~~ (Bacterial)
Non Bacterial → Dirt, gravel, clothing fibres (severity depends on the extent of contamination)

1. Gas gangrene
   - Caused by anaerobic bacteria (Clostridium)
   - Occurs in dead / damaged muscle
   - Rapidly fatal without treatment.

2. Pyogenic infections
   - Caused by streptococcus, Staphylococcus, Coliform bacteria
   - Produces pus + sytemic symptoms

3. Tetanus
   - caused by clostridium tetani
   - Signs appear days later
   - Causes muscle spasms, lockjaw

★ How body Heals wounds : (Clean, Uncomplicated wound)
1. Blood Clotting → blood fills wounds → clots → forms a scab
2. Wound Contraction (First 24 hour) scab shrinks → draw edges together
3. Granulation Tissue (Red, bumpy tissue form beneath scab (1 week), rich in new capillaries
4. Epithelialization →
5. Contraction and Scar Formation → wound shrinks for weeks
   red → Pale, thin
   doesnot tan, sweat or grow hair

white blood cells

★ Type of Open wounds
- Abrasion → scrape of skin against rough surface (road rash), Minimal bleed, must be cleaned properly
- Laceration → Deep irregular tear of skin, heavy bleeding, (knives, machine, accidents)
- Puncture → small but deep hole, Minimal bleeding, High risk of organ damage, tetanus, Infection, always requires medical attention
- Avulsion → tissue is torn away, severe bleeding (explosion, gunshot, crash)

★ Treatment of Open wounds
- Home Care → Minor Wound
  - Clean with water / disinfectant
  - apply pressure to stop bleeding
  - apply bandage
  - Use tylenol (avoid aspirin due to bleeding)
  - Apply ice for swelling
  - Use sunscreen when healed

See a doctor if wound is deep (½ inch), bleeding doesnt stop (20+ mins), Caused by major accident, caused by bit, rusty nail or puncture.

- Medical Treatments
  - Stitches
  - Skin glue
  - Tetanus shot (puncture wounds)
  - Antibiotics
  - Gauze packing

If a body sparse is severed → wrap in moist guze, place in ice, bring to hospital

★ Complication of open wounds :-
- Infection → fever, puss, Tender lumps in groin, wound not healing
- Hemorrhage → bleeding that does not stop
- Serious Conditions → tetanus, Necrotizing fasciitis, Cellulitis

★ Cuts and Puncture wounds :
...ses : Falls, Car accidents, Broken glass, Knives/razors, Bites, Stepping on sharp objects
...atments : Cuts :
- Stop bleeding → clean → antibiotic → bandage
- Remove debris with alchohol
- Deep cuts → Stitches or Staples.

Puncture : Hard to clean → high infection chances
Donot wash deeply
Must see doctor for tetanus

1. Scabbing and Scarring
2. Keloids
3. Infections

- Go to Emergency if heavy bleeding, loss of function, object impaled in body, Exposed bone, muscle
- Complications : Sepsis, grangrene, Amputation, loss of function, Nerve Organ damage

★ Surgical Wound - wound made intentionally during surgery using scalpel

Types :
- Class 1 (Clean) – no infection (eye, skin, vascular surgery)
- Class 2 (Clean-Contaminated) – higher risk (GI tract)
- Class 3 (Contaminated) – External object exposure (gunshot)
- Class 4 (Dirty-Infected) – fecal contamination

- Risk Factors for infection :- Diabetes, Weak immune system, Obesity, Smoking, Elderly, >2 hours surgery, Emergency surgeries
- Symptoms of surgical Infection : Increased pain, Redness, Pus, Fever, Foul odor, Delayed Healing
- Treatments : Frequent wound cleaning, Dressings, Irrigation with saline, Antibiotics, Opening wound if necessary

First Aid to Stop Bleeding :
- Keep calm, Apply direct pressure 10 minutes, Elevate limb, Add more cloth if blood soaks, don't r... first one,
- Clean small cuts with water, Tape clean bandage
- Don't remove embedded objects, Don't clean large wounds, Don't remove bandage early

Signs of shock : Pale, clammy skin, weak pulse, loss of conciousness (lie patient down, elevate legs)

- Nose bleeds (Procedure, Danger if)
- When you need Stitches (Size, Bleeding, location)

General Wound care (Self care, Avoid, Medication)
Special cases → Wounds in Diabetes
→ Tetanus Prevention

Ontology Specification Document Guide I followed:

✅ Guide: What to Include in Your Ontology Specification Document

Below is a section-by-section breakdown of what YOU must fill in.

1. Domain & Scope

Include:

- **A short description of the domain you are modeling**
- **What is included in the ontology**
- **What is intentionally excluded**

2. Purpose & Goals

Describe:

- **Why this ontology is being created**
- **How it will be used**
- **Who the users are (general roles, not people)**

3. Competency Questions

List the questions your ontology should answer.
(You will create 10–15 questions on your own.)

4. Key Concepts / Vocabulary

List:

- **Important terms from the domain text**
- **Definitions in your own words**
- **Terms that clearly represent classes, properties, or attributes**

5. Class Hierarchy (Taxonomy)

Include:

- **A complete tree/hierarchy of your classes**
- **Well-structured parent → child subclass design**
- **Only concepts that belong in a hierarchy (types, categories)**

Format:

- **Text outline or Diagram/screenshot from an editor**

6. Object Properties

For each property, specify:

- **Name**
- **Domain**
- **Range**
- **Short description of what relationship it represents**

Do NOT include actual domain examples, only structure.

7. Data Properties

For each property, specify:

- **Name**
- **Domain**
- **Datatype (string, integer, float, boolean, date…)**
- **What attribute it represents**

8. Axioms & Constraints

List at least three (or more) non-trivial constraints, such as:

- **Class disjointness**
- **Cardinality restrictions**
- **Property characteristics (functional, inverse functional, transitive, symmetric…)**
- **Necessary & sufficient conditions**

Describe them, but no actual ontology content.

9. Instances (Optional Section)

If you choose to include instances, specify only:

- **What kinds of individuals your ontology could include**
- **How they demonstrate reasoning**

Do *not* include actual individuals from your assignment here.

10. Reasoning Capabilities

Explain:

- **What types of inference the reasoner will be able to make**
- **Why the axioms support meaningful conclusions**

(No real reasoning results.)

11. Query Requirements

Include:

- **The type of queries you will build (DL or SPARQL)**
- **Which competency questions they will answer**
- **Only describe the query intent, not the actual query**

12. Tools & Standards

Mention:

- **What tools you are using (Protégé, reasoner, OWL language profile)**
- **Format (OWL, RDF/XML)**

13. Conclusion

Include:

- **A brief summary of your design**
- **What the ontology achieves**
- **How it supports reasoning or answers the competency questions**

Q2: Knowledge Graph - NYC Mayor

Read following Wikipedia pages

Mayor of New York City - Wikipedia
List of mayors of New York City - Wikipedia
https://en.wikipedia.org/wiki/Democratic_Party_(United_States)
Eric Adams - Wikipedia
Michael Bloomberg - Wikipedia
Rudy Giuliani - Wikipedia
Bill de Blasio - Wikipedia