from owlready2 import \*

# Create an ontology

onto = get\_ontology("http://www.example.org/liver\_cancer\_ontology.owl")

with onto:

# Define Classes (Concepts)

class Patient(Thing):

pass

class Gender(Thing):

pass

class CauseOfDeath(Thing):

pass

class Stability(Thing):

pass

class Urgency(Thing):

pass

class CytologicalForm(Thing):

pass

class LiverInjury(Thing):

pass

class LiverLobeInvolvement(Thing):

pass

class TumorType(Thing):

pass

class TumorGrade(Thing):

pass

class FatDistribution(Thing):

pass

class FatMorphology(Thing):

pass

class DiabetesType(Thing):

pass

class PressureUlcerGrade(Thing):

pass

class CKDStage(Thing):

pass

class ConnectiveTissueAmount(Thing):

pass

class MeasurementMethod(Thing):

pass

class FibrosisGrade(Thing):

pass

class UICCStage(Thing):

pass

class TNMClassification(Thing):

pass

class VenousInvasion(Thing):

pass

class PerineuralInvasion(Thing):

pass

class LymphaticInvasion(Thing):

pass

class MetastasisTiming(Thing):

pass

class GrowthType(Thing):

pass

class GrowthForm(Thing):

pass

class RecurrenceLocation(Thing):

pass

class LiverChanges(Thing):

pass

class SurgicalRadicality(Thing):

pass

class MultiResistantPathogens(Thing):

pass

class PostoperativeComplications(Thing):

pass

class PancreaticFistula(Thing):

pass

class ChildPughStage(Thing):

pass

# Define Object Properties (Relationships)

class has\_gender(Patient >> Gender):

pass

class has\_cause\_of\_death(Patient >> CauseOfDeath):

pass

class has\_stability(Patient >> Stability):

pass

class has\_urgency(Patient >> Urgency):

pass

class has\_cytological\_form(Patient >> CytologicalForm):

pass

class has\_liver\_injury(Patient >> LiverInjury):

pass

class has\_liver\_lobe\_involvement(Patient >> LiverLobeInvolvement):

pass

class has\_tumor\_type(Patient >> TumorType):

pass

class has\_tumor\_grade(Patient >> TumorGrade):

pass

class has\_fat\_distribution(Patient >> FatDistribution):

pass

class has\_fat\_morphology(Patient >> FatMorphology):

pass

class has\_diabetes\_type(Patient >> DiabetesType):

pass

class has\_pressure\_ulcer\_grade(Patient >> PressureUlcerGrade):

pass

class has\_ckd\_stage(Patient >> CKDStage):

pass

class has\_connective\_tissue\_amount(Patient >> ConnectiveTissueAmount):

pass

class has\_measurement\_method(Patient >> MeasurementMethod):

pass

class has\_fibrosis\_grade(Patient >> FibrosisGrade):

pass

class has\_uicc\_stage(Patient >> UICCStage):

pass

class has\_tnm\_classification(Patient >> TNMClassification):

pass

class has\_venous\_invasion(Patient >> VenousInvasion):

pass

class has\_perineural\_invasion(Patient >> PerineuralInvasion):

pass

class has\_lymphatic\_invasion(Patient >> LymphaticInvasion):

pass

class has\_metastasis\_timing(Patient >> MetastasisTiming):

pass

class has\_growth\_type(Patient >> GrowthType):

pass

class has\_growth\_form(Patient >> GrowthForm):

pass

class has\_recurrence\_location(Patient >> RecurrenceLocation):

pass

class has\_liver\_changes(Patient >> LiverChanges):

pass

class has\_surgical\_radicality(Patient >> SurgicalRadicality):

pass

class has\_multi\_resistant\_pathogens(Patient >> MultiResistantPathogens):

pass

class has\_postoperative\_complications(Patient >> PostoperativeComplications):

pass

class has\_pancreatic\_fistula(Patient >> PancreaticFistula):

pass

class has\_child\_pugh\_stage(Patient >> ChildPughStage):

pass

# Define Data Properties (Attributes)

class patient\_id(Patient >> str):

pass

class age(Patient >> int):

pass

class diagnosis\_date(Patient >> str):

pass

class treatment\_plan(Patient >> str):

pass

# Create Individuals (Examples)

patient\_1 = Patient("patient\_1")

patient\_1.age = 65

patient\_1.diagnosis\_date = "2025-01-15"

patient\_1.treatment\_plan = "Chemotherapy and Surgical Resection"

gender\_male = Gender("male")

patient\_1.has\_gender = [gender\_male]

cause\_of\_death\_cancer = CauseOfDeath("recurrence")

patient\_1.has\_cause\_of\_death = [cause\_of\_death\_cancer]

# Save the ontology

onto.save("liver\_cancer\_ontology.owl")