



# Ahsanullah University of Science and Technology

## Department of Computer Science and Engineering (CSE)

### CSE4108: Artificial Intelligence Lab, Spring 2018

#### Lab Group: B2    Offline: 1    Topic: Prolog

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#### **Task 1. English Sentence Syntax Checker**

We will design a toy English syntax checker. It will be a simpler subset of English Language parser. The checker will consist of some English words/phrases and some rules of valid sentences. The basic types of words/phrases and the corresponding valid words/phrases are:

**Person** Thanos, "Captain America", "Peter Parker", "Tony Stark", Nebula, Drax, Thor

**Place** Titan, Brooklyn, Queens, Manhattan, Xander, Asgard

**Thing** "Infinity Gauntlet", shield, "his fingers", webs

**Adjective** young, obsessive, narcissist, vengeful, worthy, red, blue

**Adverb** vigorously, anxious.

**Verb** destroy, snap, wield, weave, fight

**Verb(3rd person)** destroys, snaps, wields, weaves, fights

**Auxiliary verb** is, will

**Continuous verb** destroying, snapping, wielding, weaving, fighting

**Preposition** : from, in

The valid syntax structures and valid/invalid examples are described below:

- Person + 3rd Person verb + place/thing/person

**Valid Example** "Captain America" wields shield.

**Invalid Example** Thanos destroy "Tony Stark".

- Person + 3rd Person verb + place/thing/person + adverb

**Valid Example** "Peter Parker" weaves web vigorously.

**Invalid Example** Thor snap shield young.

- Person + is + adjective

**Valid Example** Nebula is blue.

**Invalid Example** Drax is will.

- person + is + continuous verb + thing/place/person

**Valid Example** Thanos is destroying Xander.

**Invalid Example** Thor is weave web.

- Person+ is + continuous verb + thing/place/person + adverb

**Valid Example** Drax is fighting Thanos vigorously.

**Invalid Example** Drax is fighting Thor red.

- Person + will + verb+ place/thing/person

**Valid Example** "Tony Stark" will fight Thanos.

**Invalid Example** "Tony Stark" is fight Thanos.

- Person + will + verb + place/thing/person + adverb

**Valid Example** Nebula will fight Thanos vigorously.

**Invalid Example** Nebula will fighting Thanos vigorously.

- Person + is + preposition + place

**Valid Example** Thanos is from Titan.

**Invalid Example** Titan is from Thanos.

You need to insert all these terms, valid words/phrases and syntax rules as facts and rules in your knowledge base. Your knowledge base will also consist of rule isValidSentence with different arity, which will take words/phrases as different parameters and return true/false if they are

valid/invalid sentences respectively.

$? - isValidSentence(Thanos, destroy, "TonyStark").$

**false**

$? - isValidSentence("CaptainAmerica", wields, shield).$

**true**

$? - isValidSentence(Thanos, is, from, Titan).$

**true**

$? - isValidSentence(Titan, is, from, Thanos).$

**false**

$? - isValidSentence(Nebula, will, fight, Thanos, vigorously).$

**true**

$? - isValidSentence(Nebula, will, fighting, Thanos, vigorously).$

**false**

## Task 2. Quadratic Equation

Write a functor `quad(A,B,C,X,Res)`, so that,  $Res = AX^2 + BX + C$

$? - quad(1, 2, 1, -5, Res).$

$-Res = 16$

## Note

Bring both the soft copy and hard copy. The soft copy should be brought in .pl files. The hard copy should contain the code printed as well as a top sheet provided by the instructors.