Christopher K. Schmitt

Problem 1.1

```
@base <https://shmishtopher.github.io#>.
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>.

:bob :believes [
  rdf:type      rdf:Statement;
  rdf:subject   :carly;
  rdf:predicate :loves;
  rdf:object    :bob
].
```
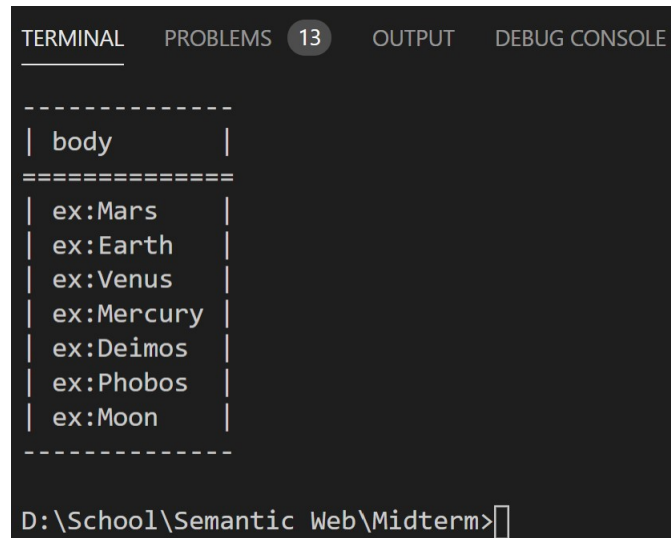
Problem 1.2

```
@base <https://shmishtopher.github.io#>.
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>.

:teacher :notices [
  rdf:type      rdf:Statement;
  rdf:subject   :john;
  rdf:predicate :worksOn;
  rdf:object    :project
].
```

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Problem 2.1

```
PREFIX ex: <http://example.org/>

SELECT ?body WHERE {
  {
    ex:Sun ex:satellite ?body.
  }

  UNION

  {
    ex:Sun ex:satellite ?child.
    ?child ex:satellite ?body.
  }
}
```
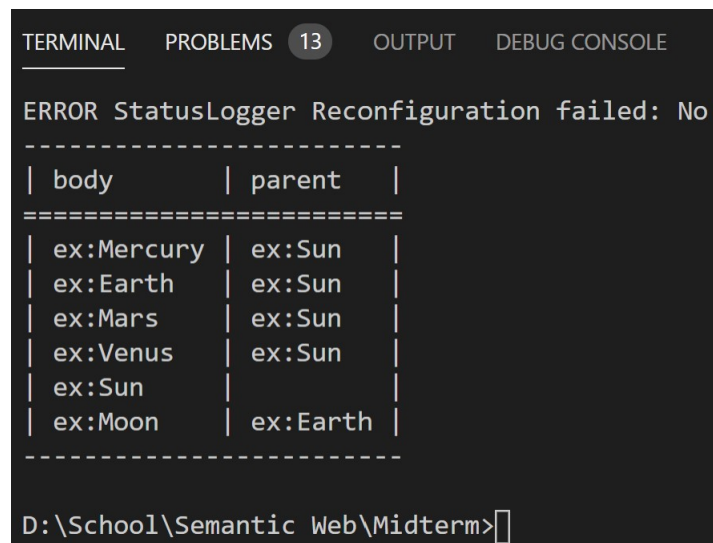
```
TERMINAL    PROBLEMS  13    OUTPUT    DEBUG CONSOLE


--------------
| body        |
==============
| ex:Mars     |
| ex:Earth    |
| ex:Venus    |
| ex:Mercury  |
| ex:Deimos   |
| ex:Phobos   |
| ex:Moon     |
--------------

D:\School\Semantic Web\Midterm>
```

Problem 2.2

```
PREFIX ex: <http://example.org/>

SELECT ?body ?parent {
  ?body ex:radius ?radius.

  FILTER(?radius > 1683.89).

  OPTIONAL {
    ?parent ex:satellite ?body.
  }
}
```

```
TERMINAL    PROBLEMS  13    OUTPUT    DEBUG CONSOLE

ERROR StatusLogger Reconfiguration failed: No
-----------------------
| body       | parent   |
=========================
| ex:Mercury | ex:Sun   |
| ex:Earth   | ex:Sun   |
| ex:Mars    | ex:Sun   |
| ex:Venus   | ex:Sun   |
| ex:Sun     |          |
| ex:Moon    | ex:Earth |
-----------------------

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```
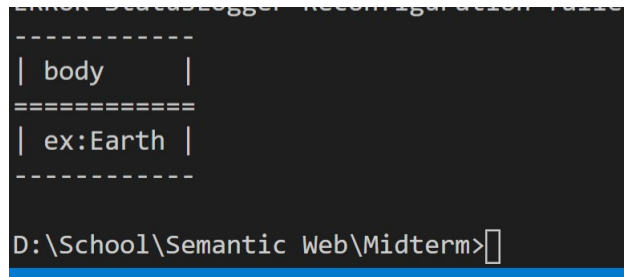
Problem 2.3

```
PREFIX ex: <http://example.org/>

SELECT DISTINCT ?body {
  ?body ex:satellite ?satellite.
  ?parent ex:satellite ?body.
  ?parent ex:radius ?radius.
  ?satellite ex:name ?name.

  FILTER(?radius > 1500 && lang(?name) = 'en').
}
```

```
-----------
| body      |
===========
| ex:Earth |
-----------

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```
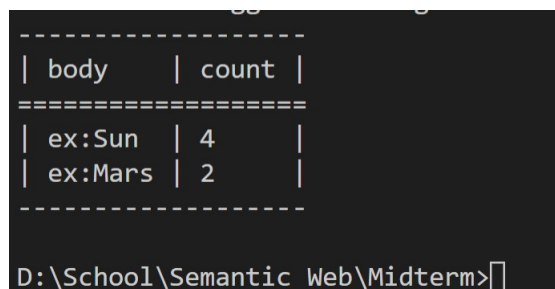
Problem 2.4

```
PREFIX ex: <http://example.org/>

SELECT ?body (COUNT(?satellite) as ?count) WHERE {
  ?body ex:satellite ?satellite.
}
GROUP BY ?body
HAVING (?count > 1)
```

```
------------------
| body    | count |
==================
| ex:Sun  | 4     |
| ex:Mars | 2     |
------------------

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```

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Problem 3

The following file is also included as an

```
@base <https://shmishtopher.github.io#>.
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#>.


#
# Films
#
:Giant
  :year 1956;
  :directedBy :FredGuiol;
  :starring
    :ElizabethTaylor,
    :RockHudson,
    :JamesDean.

:EastOfEden
  :year 1955;
  :directedBy :EliaKazan;
  :starring
    :JamesDean,
    :RaymondMassey,
    :JulieHarris.

:ItShouldHappenToYou
  :year 1954;
  :directedBy :GeorgeCukor;
  :starring
    :JudyHolliday,
    :JackLemmon,
    :PeterLawford.

:TheSearchers
  :year 1956;
  :directedBy :JohnFord;
  :starring
    :JohnWayne,
    :JefferyHunter,
    :VeraMiles.

:RebelWithoutACause
  :year 1955;
  :directedBy :NicholasRay;
  :starring
```

```
      :JamesDean,
      :NatalieWood,
      :SalMineo.


#
# Directors
#
:FredGuiol
  a :Director;
  rdfs:label "Fred Guiol".

:EliaKazan
  a :Director;
  rdfs:label "Elia Kazan".

:GeorgeCukor
  a :Director;
  rdfs:label "George Cukor".

:JohnFord
  a :Director;
  rdfs:label "John Ford".

:NicholasRay
  a :Director;
  rdfs:label "Nicholas Ray".

#
# Actors
#
:ElizabethTaylor
  a :Actor;
  rdfs:label "Elizabeth Talor".

:RockHudson
  a :Actor;
  rdfs:label "Rock Hudson".

:JamesDean
  a :Actor;
  rdfs:label "James Dean".

:RaymondMassey
  a :Actor;
  rdfs:label "Raymond Massey".
```

Christopher K. Schmitt

```
:JulieHarris
  a :Actor;
  rdfs:label "Julie Harris".

:JudyHolliday
  a :Actor;
  rdfs:label "Judy Holliday".

:JackLemmon
  a :Actor;
  rdfs:label "Jack Lemmon".

:PeterLawford
  a :Actor;
  rdfs:label "Perter Lawford".

:JohnWayne
  a :Actor;
  rdfs:label "John Wayne".

:JefferyHunter
  a :Actor;
  rdfs:label "Jeffery Hunter".

:VeraMiles
  a :Actor;
  rdfs:label "Vera Miles".

:NatalieWood
  a :Actor;
  rdfs:label "Natalie Wood".

:SalMineo
  a :Actor;
  rdfs:label "Sal Mineo".
```
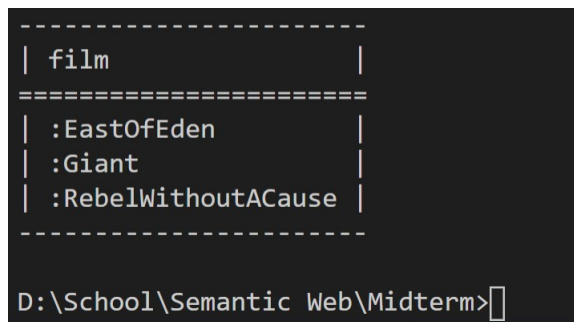
SELECT query 1:

```
PREFIX : <https://shmishtopher.github.io#>

# Select all of the films starring James Dean
SELECT  ?film WHERE {
  ?film :starring :JamesDean.
}
```
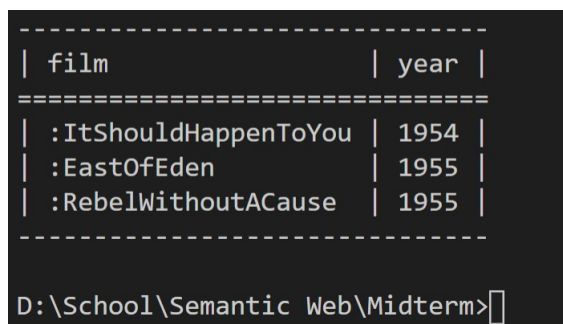
```
----------------------
| film                |
======================
| :EastOfEden         |
| :Giant              |
| :RebelWithoutACause |
----------------------

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```

SELECT query 2:

```
PREFIX : <https://shmishtopher.github.io#>

# Select all of the films produced before 1956
SELECT  ?film ?year WHERE {
  ?film :year ?year.
  FILTER(?year < 1956).
}
```

```
------------------------------
| film                 | year |
==============================
| :ItShouldHappenToYou | 1954 |
| :EastOfEden          | 1955 |
| :RebelWithoutACause  | 1955 |
------------------------------

D:\School\Semantic Web\Midterm>
```

SELECT query 3:

```
PREFIX : <https://shmishtopher.github.io#>

# Select all of actors who have worked with James Dean
SELECT ?actor ?film WHERE {
  ?film :starring :JamesDean.
  ?film :starring ?actor.

  FILTER(?actor != :JamesDean).
}
```

```
-----------------------------------------
| actor           | film                |
=========================================
| :RaymondMassey  | :EastOfEden         |
| :JulieHarris    | :EastOfEden         |
| :ElizabethTaylor| :Giant              |
| :RockHudson     | :Giant              |
| :SalMineo       | :RebelWithoutACause |
| :NatalieWood    | :RebelWithoutACause |
-----------------------------------------

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```

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CONSTRUCT query 1:

```
PREFIX : <https://shmishtopher.github.io#>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>

# Construct a graph of directors who know actors
CONSTRUCT { ?director foaf:knows ?actor } WHERE {
  ?film :directedBy ?director.
  ?film :starring ?actor.
}
```

```
@prefix :      <https://shmishtopher.github.io#> .
@prefix rdfs:  <http://www.w3.org/2000/01/rdf-schema#> .
@prefix foaf:  <http://xmlns.com/foaf/0.1/> .

:GeorgeCukor  foaf:knows  :JackLemmon , :PeterLawford , :JudyHolliday .

:NicholasRay  foaf:knows  :NatalieWood , :SalMineo , :JamesDean .

:EliaKazan  foaf:knows  :JulieHarris , :JamesDean , :RaymondMassey .

:FredGuiol  foaf:knows  :RockHudson , :JamesDean , :ElizabethTaylor .

:JohnFord  foaf:knows  :JefferyHunter , :VeraMiles , :JohnWayne .

D:\School\Semantic Web\Midterm>
```

CONSTRUCT query 2:

```
PREFIX : <https://shmishtopher.github.io#>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>

# Construct a graph of every actor who knows Fred Guiol
CONSTRUCT { ?actor foaf:knows :FredGuiol } WHERE {
  ?film :directedBy :FredGuiol.
  ?film :starring ?actor.
}
```

```
@prefix :       <https://shmishtopher.github.io#> .
@prefix rdfs:   <http://www.w3.org/2000/01/rdf-schema#> .
@prefix foaf:   <http://xmlns.com/foaf/0.1/> .

:ElizabethTaylor  foaf:knows  :FredGuiol .

:JamesDean  foaf:knows  :FredGuiol .

:RockHudson  foaf:knows  :FredGuiol .

D:\School\Semantic Web\Midterm>
```

ASK query:

```
PREFIX : <https://shmishtopher.github.io#>

# Did Fred Guiol direct "Giant"?
ASK {
  :Giant :directedBy :FredGuiol.
}
```

```
Ask => Yes

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```

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DESCRIBE query:

```
PREFIX : <https://shmishtopher.github.io#>

# Describe all the movies James Dean starred in
DESCRIBE ?x WHERE {
  ?x :starring :JamesDean.
}
```

```
@prefix :      <https://shmishtopher.github.io#> .
@prefix rdfs:  <http://www.w3.org/2000/01/rdf-schema#> .

:EastOfEden  :directedBy  :EliaKazan ;
       :starring    :JulieHarris , :JamesDean , :RaymondMassey ;
       :year        1955 .

:RebelWithoutACause  :directedBy  :NicholasRay ;
       :starring    :NatalieWood , :SalMineo , :JamesDean ;
       :year        1955 .

:Giant  :directedBy  :FredGuiol ;
       :starring    :RockHudson , :JamesDean , :ElizabethTaylor ;
       :year        1956 .

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```

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Problem 4.1

```
PREFIX ex: <http://example.org/addressbook#>
PREFIX d: <http://example.org/data#>

INSERT DATA {
  d:i44
      ex:firstName "George";
      ex:lastName "Westerlund";
      ex:homeTel "(414) 344-1585";
      ex:email "GeorgeMWesterlund@gmail.com".

  d:i55
      ex:firstName "Elizabeth";
      ex:lastName "Holland";
      ex:homeTel "(802) 245-5788";
      ex:email "ElizabethMHolland@gmail.com".
}
```

Problem 4.2

```
PREFIX ex: <http://example.org/addressbook#>
PREFIX d: <http://example.org/data#>

CONSTRUCT {
  ?s a ex:Student.
  ?s ?p ?o.
}
WHERE { ?s ?p ?o }
```

```
 1  @prefix ex:    <http://example.org/addressbook#> .
 2  @prefix d:     <http://example.org/data#> .
 3
 4  d:i55   a              ex:Student ;
 5          ex:email       "ElizabethMHolland@gmail.com" ;
 6          ex:firstName   "Elizabeth" ;
 7          ex:homeTel     "(802) 245-5788" ;
 8          ex:lastName    "Holland" .
 9
10  d:i44   a              ex:Student ;
11          ex:email       "GeorgeMWesterlund@gmail.com" ;
12          ex:firstName   "George" ;
13          ex:homeTel     "(414) 344-1585" ;
14          ex:lastName    "Westerlund" .
15
16  d:i33   a              ex:Student ;
17          ex:email       "greg@gmail.com" , "greg@yahoo.com" ;
18          ex:firstName   "Greg" ;
19          ex:lastName    "Wilson" .
20
21  d:i22   a              ex:Student ;
22          ex:email       "emi@gmail.com" ;
23          ex:firstName   "Emi" ;
24          ex:homeTel     "(860) 846-2323" ;
25          ex:lastName    "Smith" .
26
27  d:i11   a              ex:Student ;
28          ex:email       "bob@hotmail.com" ;
29          ex:firstName   "Bob" ;
30          ex:homeTel     "(560) 333-5135" ;
31          ex:lastName    "Jones" .
32
```

Problem 4.3

```
PREFIX ex: <http://example.org/addressbook#>
PREFIX d: <http://example.org/data#>

SELECT DISTINCT ?first ?last {
  ?x ex:firstName ?first.
  ?x ex:lastName ?last.

  FILTER NOT EXISTS { ?x ex:homeTel ?o }.
}
```

first		last	
1 "Greg"		"Wilson"	

Showing 1 to 1 of 1 entries

Problem 4.4

```
PREFIX ex: <http://example.org/addressbook#>
PREFIX d: <http://example.org/data#>

INSERT { ?s ex:homeTel "(860) 578-7614" }
WHERE {
  ?s ?p ?o.
  MINUS { ?s ex:homeTel ?x }
}
```

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Final Graph (also included in attachments):

```
@prefix ex:     <http://example.org/addressbook#> .
@prefix d:      <http://example.org/data#> .

d:i55   a           ex:Student ;
        ex:email        "ElizabethMHolland@gmail.com" ;
        ex:firstName    "Elizabeth" ;
        ex:homeTel      "(802) 245-5788" ;
        ex:lastName     "Holland" .

d:i44   a           ex:Student ;
        ex:email        "GeorgeMWesterlund@gmail.com" ;
        ex:firstName    "George" ;
        ex:homeTel      "(414) 344-1585" ;
        ex:lastName     "Westerlund" .

d:i33   a           ex:Student ;
        ex:email        "greg@gmail.com" , "greg@yahoo.com" ;
        ex:firstName    "Greg" ;
        ex:homeTel      "(860) 578-7614" ;
        ex:lastName     "Wilson" .

d:i22   a           ex:Student ;
        ex:email        "emi@gmail.com" ;
        ex:firstName    "Emi" ;
        ex:homeTel      "(860) 846-2323" ;
        ex:lastName     "Smith" .

d:i11   a           ex:Student ;
        ex:email        "bob@hotmail.com" ;
        ex:firstName    "Bob" ;
        ex:homeTel      "(560) 333-5135" ;
        ex:lastName     "Jones" .
```