Question 1 - Code

```
> cj_hess510 > Desktop > MST Computer Science > CS 1200 > Homework 1 > home
# Question 1
hyps = [ '(p and r) <= q','r or (not q)', 'q <= p']
concl = '(p and q) <= r'

fst = "{0:^3s}|{1:^3s}|{2:^3s}|{3:^3s}|{4:^8s}|{5:^7s}|{6:^9s}|"
fst2 = "{0:^3d}|{1:^3d}|{2:^3d}|  {3:^3d}  |{4:^8d}|{5:^7d}|{6:^9d}|"
div = "---+---+---+-------+--------+-------+---------+---"

print(fst.format('p','q','r','p& r->q','r| ~q','q -> p','p & q->r'))
for p in range(2):
    for q in range(2):
        for r in range(2):
            print(div)
            print (fst2.format(p,q,r, eval(hyps[0]),
                    eval(hyps[1]), eval(hyps[2]),eval(concl)))
```

Question 1 - Output

```
(base) CJs-MacBook-Pro:~ cj_hess510$ python -u "/Users/cj_hess510/Desktop/M
ork1-part1.py"
 p | q | r |p& r->q| r| ~q  |q -> p |p & q->r |
---+---+---+-------+--------+-------+---------+---
 0 | 0 | 0 |   1   |   1    |   1   |    1    |
---+---+---+-------+--------+-------+---------+---
 0 | 0 | 1 |   1   |   1    |   1   |    1    |
---+---+---+-------+--------+-------+---------+---
 0 | 1 | 0 |   1   |   0    |   0   |    1    |
---+---+---+-------+--------+-------+---------+---
 0 | 1 | 1 |   1   |   1    |   0   |    1    |
---+---+---+-------+--------+-------+---------+---
 1 | 0 | 0 |   1   |   1    |   1   |    1    |
---+---+---+-------+--------+-------+---------+---
 1 | 0 | 1 |   0   |   1    |   1   |    1    |
---+---+---+-------+--------+-------+---------+---
 1 | 1 | 0 |   1   |   0    |   1   |    0    |
---+---+---+-------+--------+-------+---------+---
 1 | 1 | 1 |   1   |   1    |   1   |    1    |
(base) CJs-MacBook-Pro:~ cj_hess510$
```

Question 2 – Code

```
# Question 2
hyps = [ '((not m) and c) <= (not t)','(not c) <= ((not m) or (not t))']
concl = 'm <= c'

fst = "{0:^3s}|{1:^3s}|{2:^3s}|{3:^3s}|{4:^8s}|  {5:^7s}   |"
fst2 = "{0:^3d}|{1:^3d}|{2:^3d}|      {3:^3d}     | {4:^8d}      |   {5:^7d}  |"
div = "---+---+---+-------------+---------------+------------+"

print(fst.format('m','c','t','(~m & c) -> ~t','~c -> (~m | ~t)','m -> c'))
for m in range(2):
  for c in range(2):
    for t in range(2):
        print(div)
        print (fst2.format(m,c,t, eval(hyps[0]),
                eval(hyps[1]),eval(concl)))
```

Question 2 - Output

```
(base) CJs-MacBook-Pro:~ cj_hess510$ python -u "/Users/cj_hess510/Desktop/MST Computer Science/CS 1200/homework1-part2.py"
 m | c | t |(~m & c) -> ~t|~c -> (~m | ~t)|  m -> c    |
---+---+---+-------------+---------------+------------+
 0 | 0 | 0 |       1      |    1          |      1     |
---+---+---+-------------+---------------+------------+
 0 | 0 | 1 |       1      |    1          |      1     |
---+---+---+-------------+---------------+------------+
 0 | 1 | 0 |       1      |    1          |      1     |
---+---+---+-------------+---------------+------------+
 0 | 1 | 1 |       0      |    1          |      1     |
---+---+---+-------------+---------------+------------+
 1 | 0 | 0 |       1      |    1          |      0     |
---+---+---+-------------+---------------+------------+
 1 | 0 | 1 |       1      |    0          |      0     |
---+---+---+-------------+---------------+------------+
 1 | 1 | 0 |       1      |    1          |      1     |
---+---+---+-------------+---------------+------------+
 1 | 1 | 1 |       1      |    1          |      1     |
(base) CJs-MacBook-Pro:~ cj_hess510$
```

Question 3 – Code

```
# Question 3
hyps = [ 'p <= q','r or s', '(not s) <= (not t)', '(not q) or s', '(not s)', '((not p) and r) <= u', 'w or t']
concl = 'u and w'

fst = "{0:^3s}|{1:^3s}|{2:^3s}|{3:^3s}|{4:^3s}|{5:^3s}|{6:^3s}|{7:^3s}|{8:^3s}|{9:^3s}|{10:^3s}|{11:^3s}|{12:^3s}|{13:^3s}|"
fst2 = "{0:^3d}|{1:^3d}|{2:^3d}|{3:^3d}|{4:^3d}|{5:^3d}|{6:^3d}| {7:^3d} | {8:^3d} | {9:^3d} | {10:^3d} | {11:^3d} | {12:^3d} |   {13:^3d}   |"
div = "---+---+---+---+---+---+---+-----+-----+-----+-----+-----+-----+----------+"

print(fst.format('p','q','r', 's', 't', 'w', 'u', 'prem1','prem2','prem3','prem4','prem5','prem6','conclusion'))
for p in range(2):
  for q in range(2):
    for r in range(2):
      for s in range(2):
        for t in range(2):
          for w in range(2):
            for u in range(2):
              print(div)
              print (fst2.format(p,q,r,s,t,w,u, eval(hyps[0]),
                      eval(hyps[1]), eval(hyps[2]), eval(hyps[3]), eval(hyps[4]),
                      eval(hyps[5]), eval(concl)))
```

Question 3 - Output

p	q	r	s	t	w	u	prem1	prem2	prem3	prem4	prem5	prem6	conclusion
0	0	0	0	0	0	0	1	0	1	1	1	1	0
0	0	0	0	0	0	1	1	0	1	1	1	1	0
0	0	0	0	0	1	0	1	0	1	1	1	1	0
0	0	0	0	0	1	1	1	0	1	1	1	1	1
0	0	0	0	1	0	0	1	0	0	1	1	1	0
0	0	0	0	1	0	1	1	0	0	1	1	1	0
0	0	0	0	1	1	0	1	0	0	1	1	1	0
0	0	0	0	1	1	1	1	0	0	1	1	1	1
0	0	0	1	0	0	0	1	1	1	1	0	1	0
0	0	0	1	0	0	1	1	1	1	1	0	1	0
0	0	0	1	0	1	0	1	1	1	1	0	1	0
0	0	0	1	0	1	1	1	1	1	1	0	1	1
0	0	0	1	1	0	0	1	1	1	1	0	1	0
0	0	0	1	1	0	1	1	1	1	1	0	1	0
0	0	0	1	1	1	0	1	1	1	1	0	1	0
0	0	0	1	1	1	1	1	1	1	1	0	1	1
0	0	1	0	0	0	0	1	1	1	1	1	0	0
0	0	1	0	0	0	1	1	1	1	1	1	1	0
0	0	1	0	0	1	0	1	1	1	1	1	0	0
0	0	1	0	0	1	1	1	1	1	1	1	1	1
0	0	1	0	1	0	0	1	1	0	1	1	0	0
0	0	1	0	1	0	1	1	1	0	1	1	1	0
0	0	1	0	1	1	0	1	1	0	1	1	0	0
0	0	1	0	1	1	1	1	1	0	1	1	1	1
0	0	1	1	0	0	0	1	1	1	1	0	0	0
0	0	1	1	0	0	1	1	1	1	1	0	1	0
0	0	1	1	0	1	0	1	1	1	1	0	0	0
0	0	1	1	0	1	1	1	1	1	1	0	1	1
0	0	1	1	1	0	0	1	1	1	1	0	0	0
0	0	1	1	1	0	1	1	1	1	1	0	1	0
0	0	1	1	1	1	0	1	1	1	1	0	0	0
0	0	1	1	1	1	1	1	1	1	1	0	1	1
0	1	0	0	0	0	0	1	0	1	0	1	1	0
0	1	0	0	0	0	1	1	0	1	0	1	1	0

1	0	1	1	1	0	1	0	1	1	1	0	1	0
1	0	1	1	1	1	0	0	1	1	1	0	1	0
1	0	1	1	1	1	1	0	1	1	1	0	1	1
1	1	0	0	0	0	0	1	0	1	0	1	1	0
1	1	0	0	0	0	1	1	0	1	0	1	1	0
1	1	0	0	0	1	0	1	0	1	0	1	1	0
1	1	0	0	0	1	1	1	0	1	0	1	1	1
1	1	0	0	1	0	0	1	0	0	0	1	1	0
1	1	0	0	1	0	1	1	0	0	0	1	1	0
1	1	0	0	1	1	0	1	0	0	0	1	1	0
1	1	0	0	1	1	1	1	0	0	0	1	1	1
1	1	0	1	0	0	0	1	1	1	1	0	1	0
1	1	0	1	0	0	1	1	1	1	1	0	1	0
1	1	0	1	0	1	0	1	1	1	1	0	1	0
1	1	0	1	0	1	1	1	1	1	1	0	1	1
1	1	0	1	1	0	0	1	1	1	1	0	1	0
1	1	0	1	1	0	1	1	1	1	1	0	1	0
1	1	0	1	1	1	0	1	1	1	1	0	1	0
1	1	0	1	1	1	1	1	1	1	1	0	1	1
1	1	1	0	0	0	0	1	1	1	0	1	1	0
1	1	1	0	0	0	1	1	1	1	0	1	1	0
1	1	1	0	0	1	0	1	1	1	0	1	1	0
1	1	1	0	0	1	1	1	1	1	0	1	1	1
1	1	1	0	1	0	0	1	1	0	0	1	1	0
1	1	1	0	1	0	1	1	1	0	0	1	1	0
1	1	1	0	1	1	0	1	1	0	0	1	1	0
1	1	1	0	1	1	1	1	1	0	0	1	1	1
1	1	1	1	0	0	0	1	1	1	1	0	1	0
1	1	1	1	0	0	1	1	1	1	1	0	1	0
1	1	1	1	0	1	0	1	1	1	1	0	1	0
1	1	1	1	0	1	1	1	1	1	1	0	1	1
1	1	1	1	1	0	0	1	1	1	1	0	1	0
1	1	1	1	1	0	1	1	1	1	1	0	1	0
1	1	1	1	1	1	0	1	1	1	1	0	1	0
1	1	1	1	1	1	1	1	1	1	1	0	1	1

(base) Cls-MacBook-Pro:~ ci_hes510$