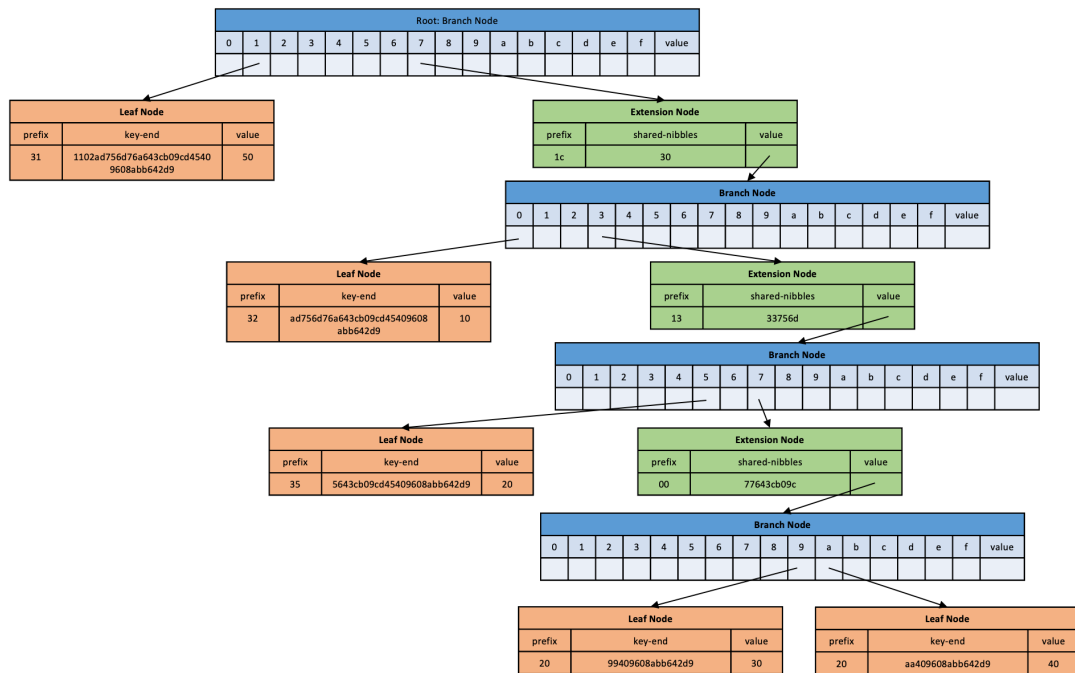# CS5363 Blockchain Technologies and Applications: Hw5 – Test Paper Merkle Patricia Tree

Scenario 1:

Draw your Trie Diagram (just as <u>Diagram-1</u>):
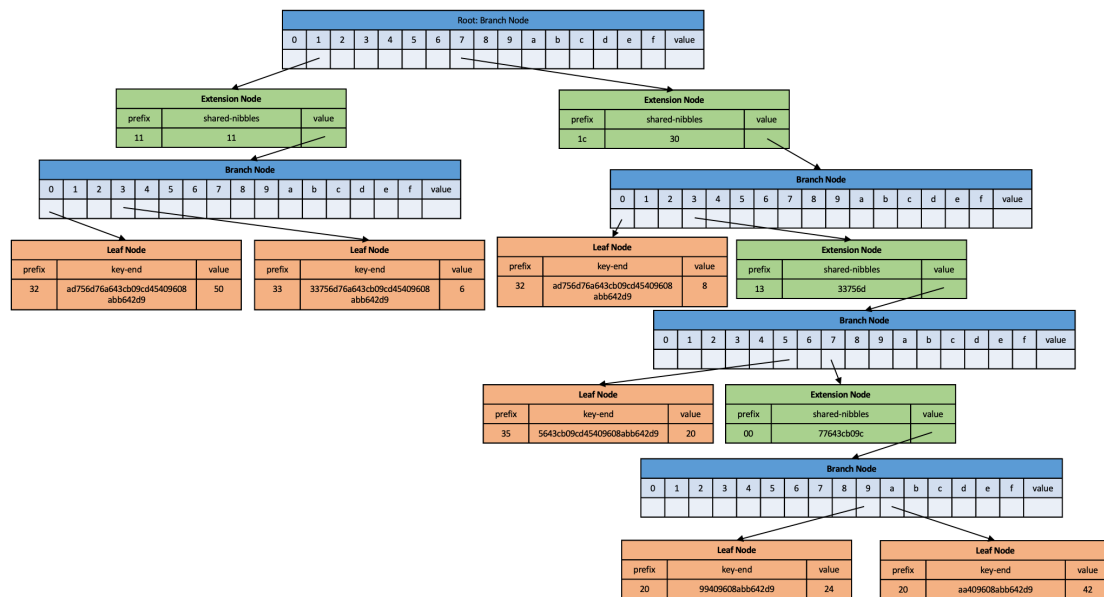

Display your Trie by your program:

State Root =

b3506d16d769a8aaf5e2fe2f4449a673b408472c04ba0e0837aba0bc9d5364cd

Scenario 2:

Draw your Trie Diagram (just as Diagram-1):

Root: Branch Node

0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f	value

Extension Node

prefix	shared-nibbles	value
11	11	

Extension Node

prefix	shared-nibbles	value
1c	30	

Branch Node

0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f	value

Leaf Node

prefix	key-end	value
32	ad756d76a643cb09cd45409608abb642d9	50

Leaf Node

prefix	key-end	value
33	33756d76a643cb09cd45409608abb642d9	6

Branch Node

0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f	value

Leaf Node

prefix	key-end	value
32	ad756d76a643cb09cd45409608abb642d9	8

Extension Node

prefix	shared-nibbles	value
13	33756d	

Branch Node

0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f	value

Leaf Node

prefix	key-end	value
35	5643cb09cd45409608abb642d9	20

Extension Node

prefix	shared-nibbles	value
00	77643cb09c	

Branch Node

0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f	value

Leaf Node

prefix	key-end	value
20	99409608abb642d9	24

Leaf Node

prefix	key-end	value
20	aa409608abb642d9	42

Display your Trie by your program:

```
Branch, [hash]: b'\xef\xf4\x02\xb4l+\x81\xe20y|\xf2$\xc5D\n\xef\xde\x935YBq\xe1\x9d\xa8\xc7^\xccGm\x08'
 ├─ [1]
  Extension, [key]: 1111, [hash]: b'\xc60\x14\xbf\xa8/\x9de\xab\xe6\x8e{\x9fG\xea\xba0\xa7\xd4*\xa7~+\x0f\r~)\xe7\x1c\x95pi'
   ├─ [0]
   Leaf, [key]: 32ad756d76a643cb09cd45409608abb642d9, [value]: b'50', [hash]: [b'2\xadumv\xa6C\xcb\t\xcdE@\x96\x08\xab\xb6B\xd9', b'50']
    ├─ [3]
   Leaf, [key]: 3333756d76a643cb09cd45409608abb642d9, [value]: b'6', [hash]: [b'33umv\xa6C\xcb\t\xcdE@\x96\x08\xab\xb6B\xd9', b'6']
    ├─ [7]
  Extension, [key]: 1c30, [hash]: b'\xff\xa5\xdds\xbcs\x14\xb9XW\x14#\x0b=*\xcc\xce\xf9\xb4\xc7\xf0\xda\xc2\rT.?\x11\x00\xa5\x943'
   ├─ [0]
   Leaf, [key]: 32ad756d76a643cb09cd45409608abb642d9, [value]: b'8', [hash]: [b'2\xadumv\xa6C\xcb\t\xcdE@\x96\x08\xab\xb6B\xd9', b'8']
    ├─ [3]
   Extension, [key]: 1333756d, [hash]: b'\x94\xa2\x98\xcc\xefn8\t\xc0\xb8\x8b\x1dH@\xb5\xba\xf0\xce 0\x8b\x95\xb5\xc7\xe1Gv\x10\x06\x071\xf4'
    ├─ [5]
    Leaf, [key]: 355643cb09cd45409608abb642d9, [value]: b'20', [hash]: [b'5VC\xcb\t\xcdE@\x96\x08\xab\xb6B\xd9', b'20']
     ├─ [7]
    Extension, [key]: 0077643cb09c, [hash]: b'u\x19Px\xd6\xa6b7\xb7\xc6u\xc5P0Fm\xd43R\xee\xcf\x17+\x84\x963\xbf\xf5Y\xed\x0cL'
     ├─ [9]
     Leaf, [key]: 2099409608abb642d9, [value]: b'24', [hash]: [b' \x99@\x96\x08\xab\xb6B\xd9', b'24']
      ├─ [A]
     Leaf, [key]: 20aa409608abb642d9, [value]: b'42', [hash]: [b' \xaa@\x96\x08\xab\xb6B\xd9', b'42']
roothash:  b'\xef\xf4\x02\xb4l+\x81\xe20y|\xf2$\xc5D\n\xef\xde\x935YBq\xe1\x9d\xa8\xc7^\xccGm\x08'
roothash in str:  eff402b46c2b81e230797cf224c5440aefde9335594271e19da8c75ecc476d08
```

(New) State Root =

eff402b46c2b81e230797cf224c5440aefde9335594271e19da8c75ecc476d08