B- Tree

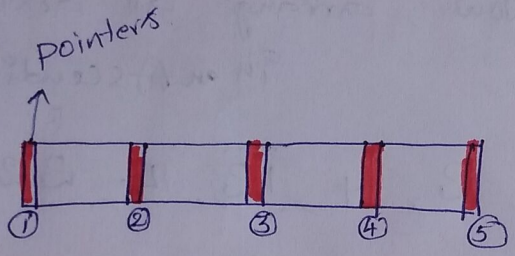
Elements:

2, 14, 12, 4, 22, 8, 16, 26, 20, 10, 38, 18, 36, 48, 6, 24, 28, 40, 42, 32

Order: $m = 5$

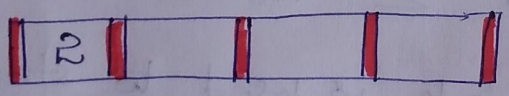
i.e Each node has at most 5 pointers
Each node has at most 4 elements (keys)

Initially:

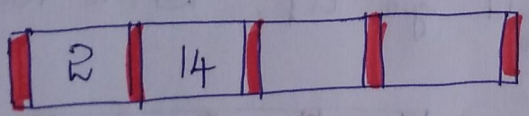


Empty Node

insert 2

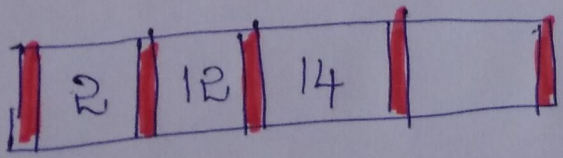


insert 14

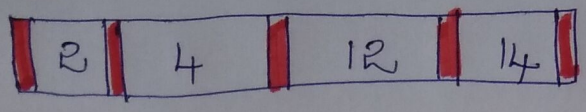


While inserting elements elements should be in an Ascending order.

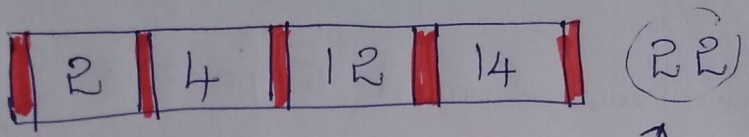
insert 12



insert '4'



insert '22'



To insert '22' No space

Now, arrange all above elements in an Ascending order

2, 4, 12, 14, 22

Now find median from above elements

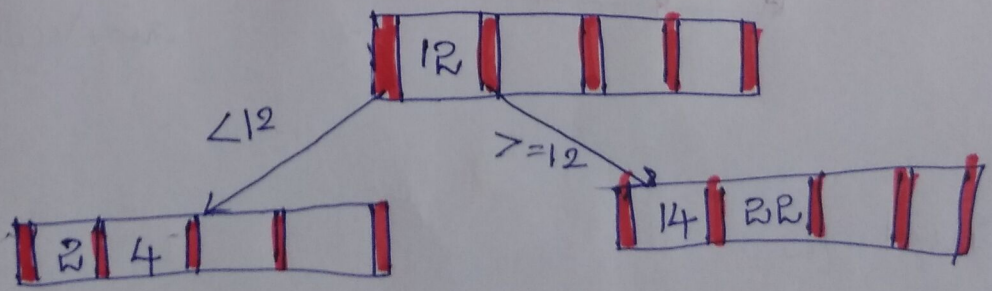
median is "12"

Split the Node into '2' Nodes

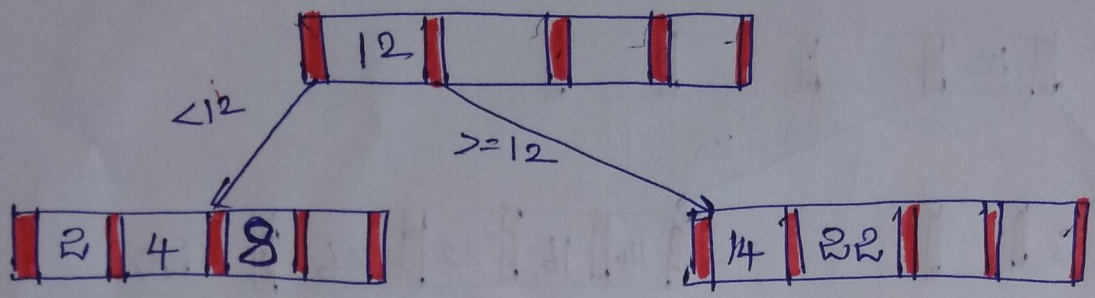
One Node is used to store left of median

Another Node is used to store right of median

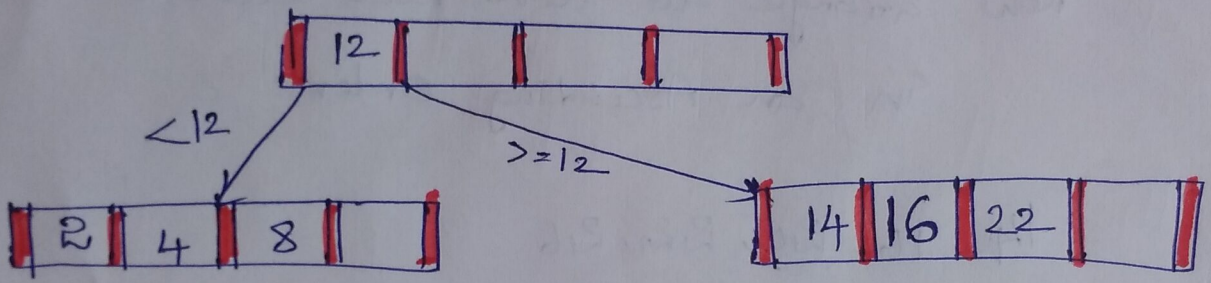
Median element should go up, With New Node



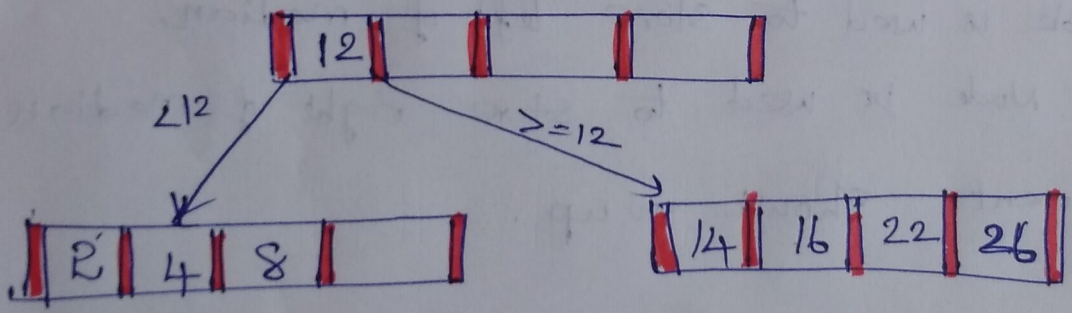
Insert 8'



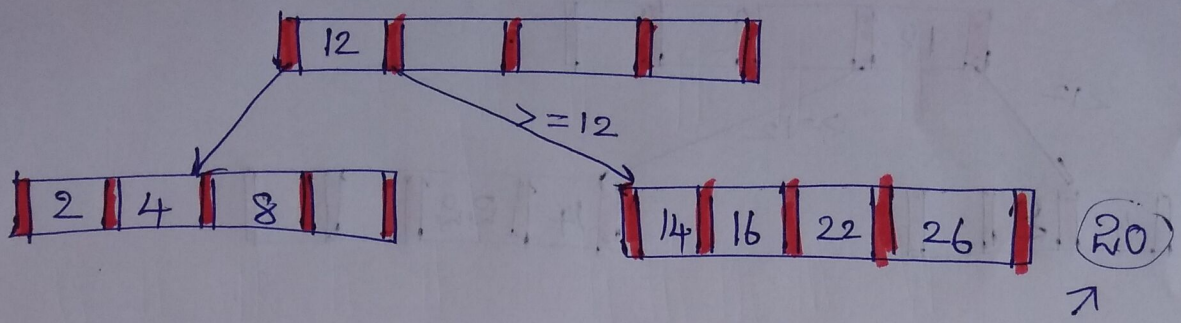
Insert 16 :



Insert 26



Insert 20 :-



To insert '20' No space

Now arrange all above Node elements in an Ascending Order

14, 16, 20, 22, 26

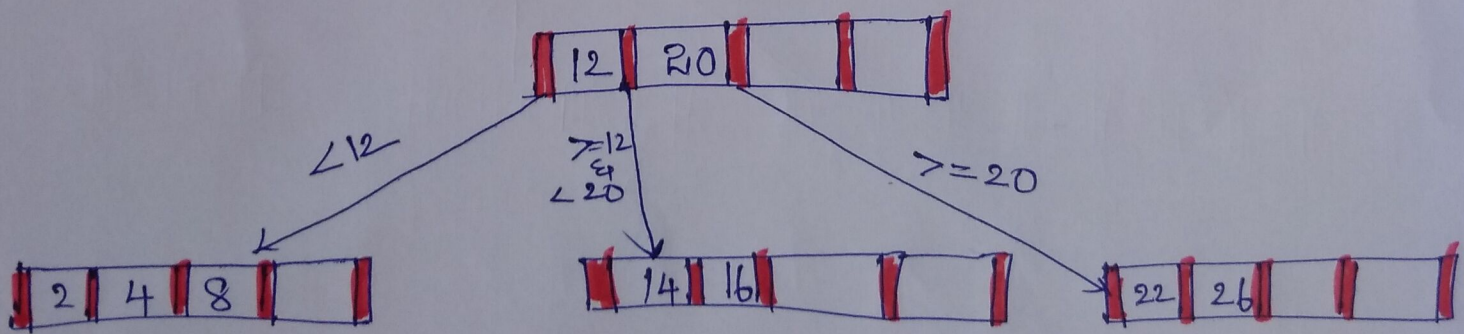
Median is '20'

Split the Node into '2' Nodes

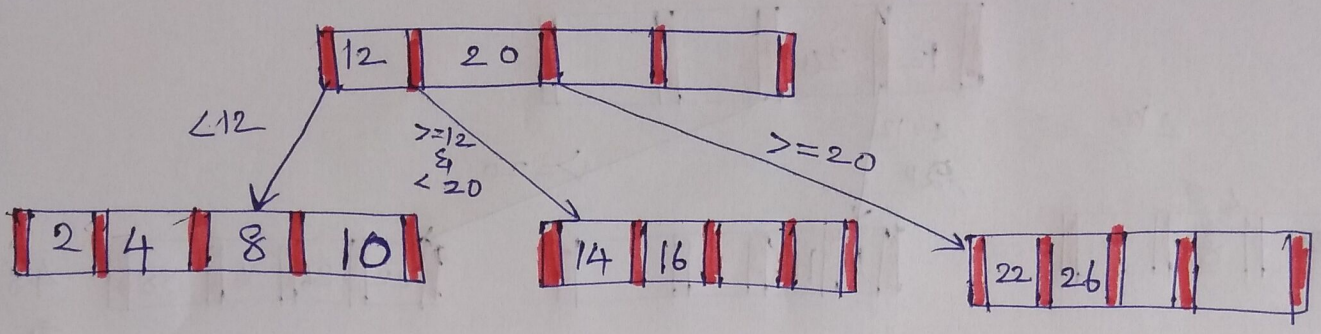
One Node is used to store left of median

another Node is used to store right of median

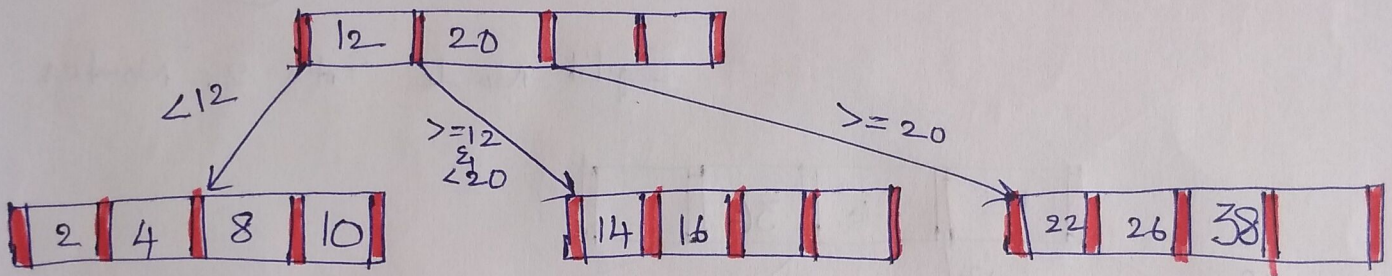
Median element should go up.



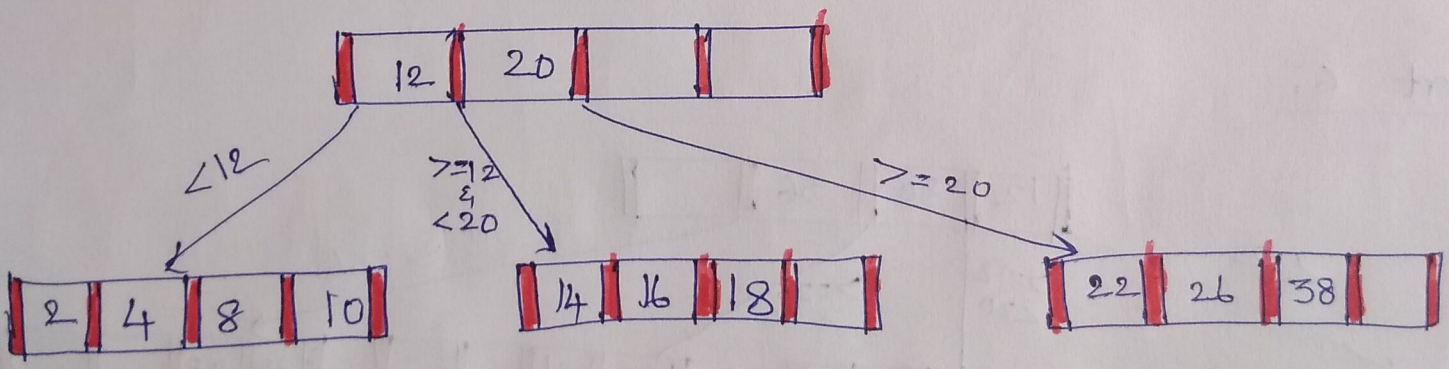
Insert 10 :-



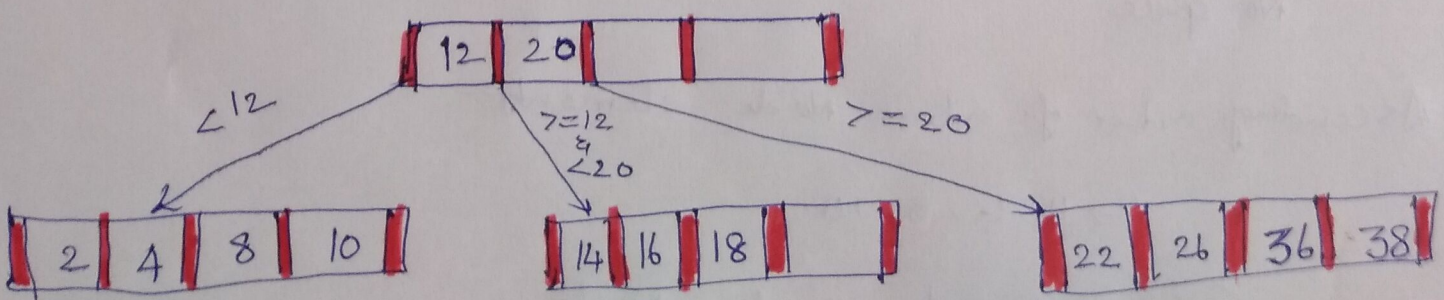
Insert 38 :



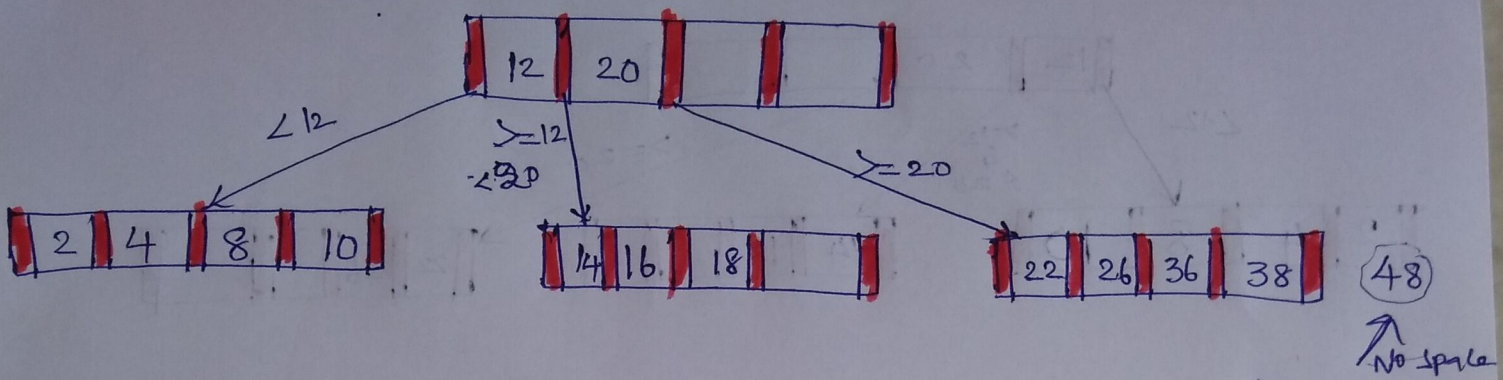
Insert 18 :



Insert 36 :-



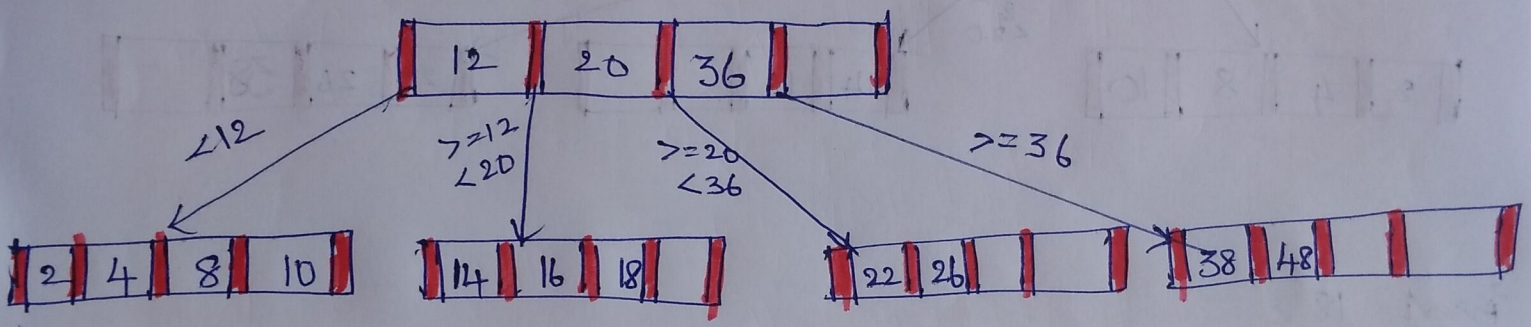
Insert 48:



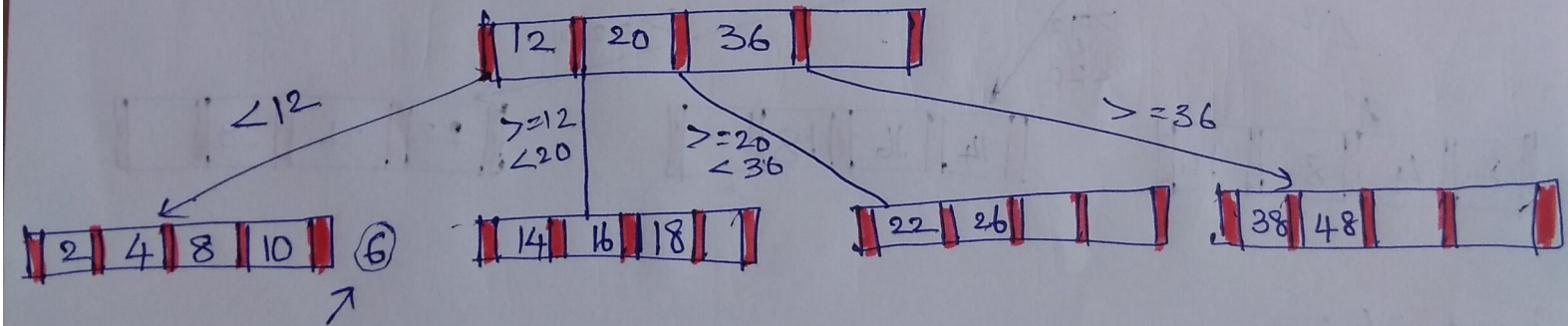
Ascending order ↑ elements

22, 26, (36) 38, 48

Split Node into 2 Nodes.



Insert 6:.

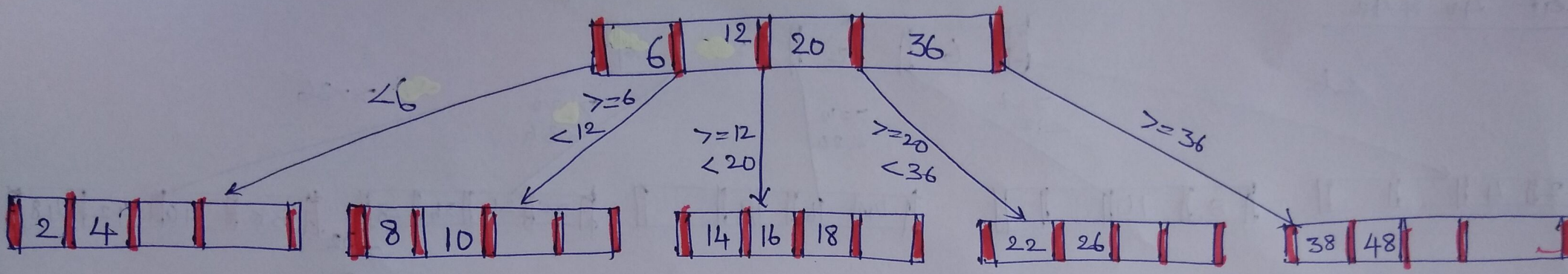


No space

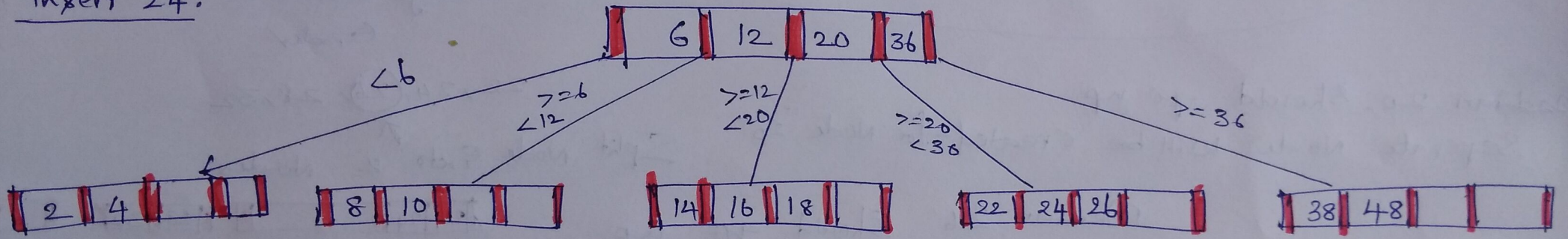
Ascending order of above Node elements

2, 4, (6), 8, 10

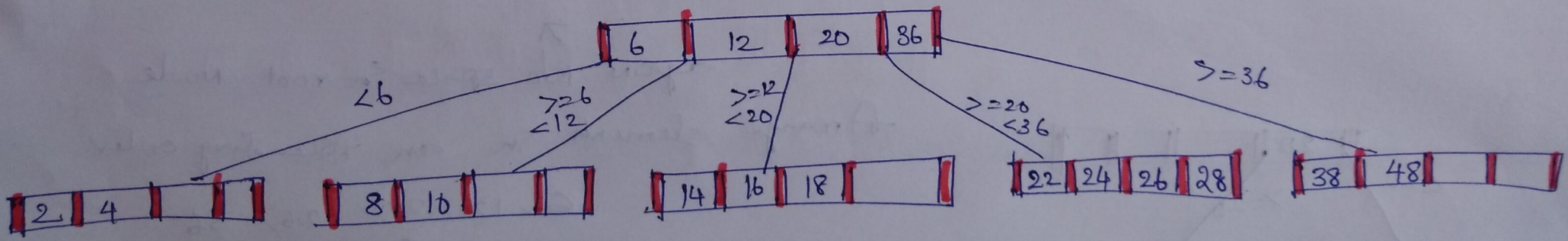
Split Node into 2 two Node



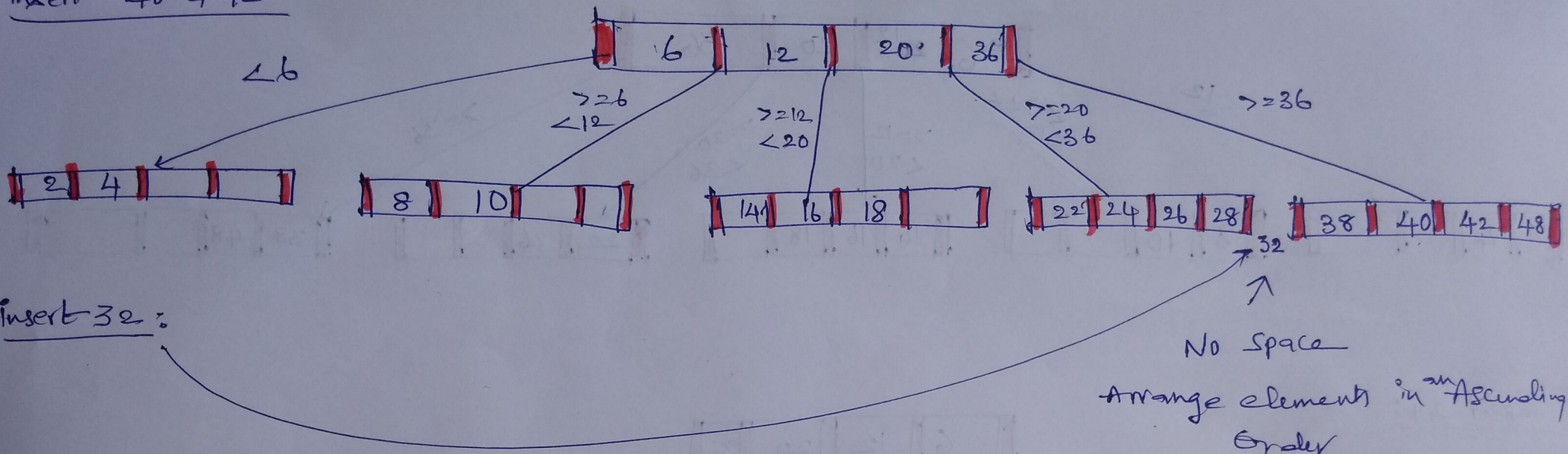
Insert 24:



Insert 28:



Insert 40 & 42



Insert 32:

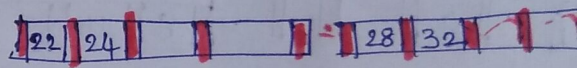
No Space

Arrange elements in an Ascending Order

22, 24, 26, 28, 32

Median 26, should go up

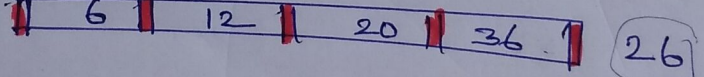
Split Node into 2 Nodes.



Seperate Node will be Created for Node "26"

Median '26' Should go up

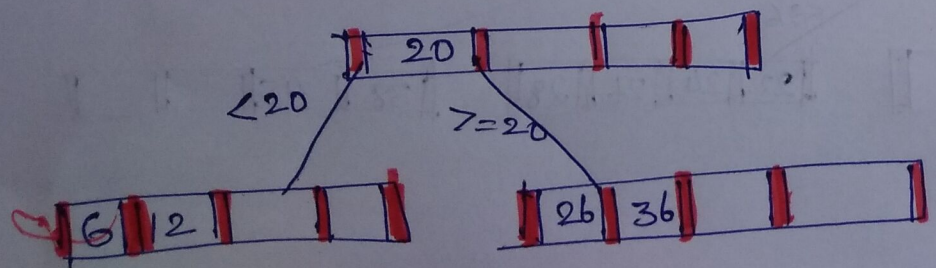
root Node



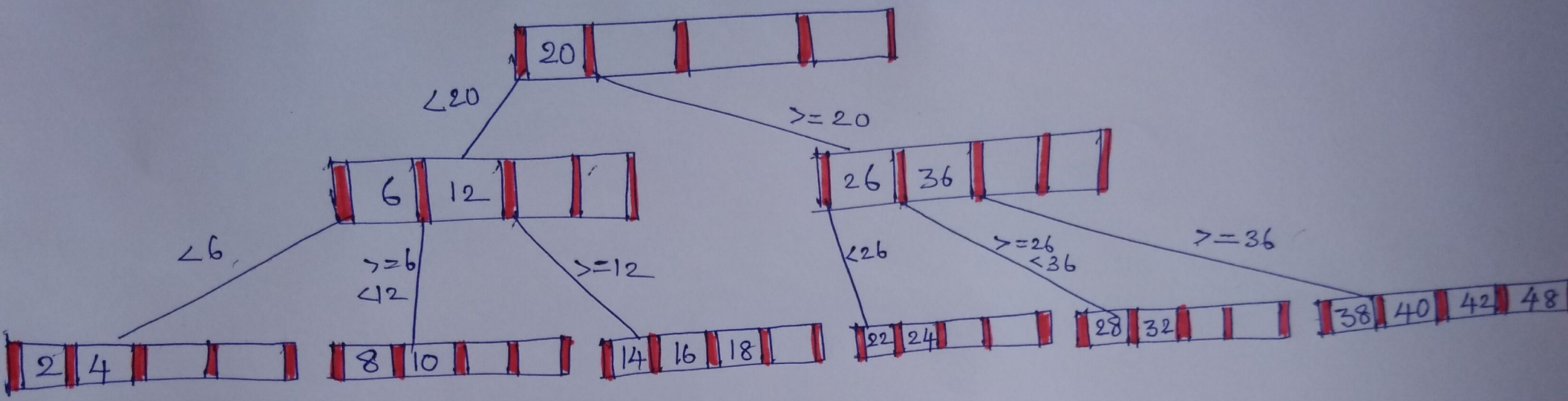
again No space in root Node

Arrange elements in an Ascending order

6, 12, 20, 26, 36



Split root Node into 2 Nodes.


20
<20
>=20
6
12
26
36
<6
>=6
<12
>=12
<26
>=26
<36
>=36
2
4
8
10
14
16
18
22
24
28
32
38
40
42
48