Perform insertion sort Key = a[i]

| 1 | 19 | 20 | 2 | 3 | 0 | 11 | 17 | 10 | 7 |
(j above position 1, i above position of 20) i $\boxed{1}$ j $\boxed{0}$ Key $\boxed{20}$

| 1 | 19 | 20 | 2 | 3 | 0 | 11 | 17 | 10 | 7 | i $\boxed{\not{1}}$2   j $\boxed{\not{0}}$1   Key $\boxed{20}$ 2

| 1 | 2 | 19 | 20 | 3 | 0 | 11 | 17 | 10 | 7 | i $\boxed{\not{1}}$ $\not{2}$ 3   j $\boxed{\not{0}}$ $\not{1}$ 2   Key $\boxed{20}$ $\not{2}$ 3

| 1 | 2 | 3 | 19 | 20 | 0 | 11 | 17 | 10 | 7 | i $\boxed{\not{1}}$ $\not{2}$ $\not{3}$ 4   j $\boxed{\not{0}}$ $\not{1}$ $\not{2}$ 3   Key $\boxed{20}$ $\not{2}$ $\not{3}$ 0

| 1 | 0 | 2 | 3 | 19 | 20 | 11 | 17 | 10 | 7 | i $\boxed{\not{1}}$ $\not{2}$ $\not{3}$ $\not{4}$ 5   j $\boxed{\not{0}}$ $\not{1}$ $\not{2}$ $\not{3}$ 4

Key $\boxed{20}$ $\not{2}$ $\not{3}$ $\not{0}$ 11

| 1 | 0 | 2 | 3 | 11 | 19 | 20 | 17 | 10 | 7 | i $\boxed{\not{1}}$ $\not{2}$ $\not{3}$ $\not{4}$ $\not{5}$ 6   j $\boxed{\not{0}}$ $\not{1}$ $\not{2}$ $\not{3}$ $\not{4}$ 5

Key $\boxed{20}$ $\not{2}$ $\not{3}$ $\not{0}$ $\not{11}$ 17

| 1 | 0 | 2 | 3 | 11 | 17 | 19 | 20 | 10 | 7 | i $\boxed{\not{1}}$ $\not{2}$ $\not{3}$ $\not{4}$ $\not{8}$ $\not{6}$ 7   j $\boxed{\not{0}}$ $\not{1}$ $\not{2}$ $\not{3}$ $\not{4}$ $\not{8}$ 6

Key $\boxed{20}$ $\not{2}$ $\not{3}$ $\not{0}$ $\not{11}$ $\not{17}$ 10

| 1 | 0 | 2 | 3 | 10 | 11 | 17 | 19 | 20 | 7 | i $\boxed{\not{1}}$ $\not{2}$ $\not{3}$ $\not{4}$ $\not{8}$ $\not{6}$ $\not{7}$ 8 j $\boxed{\not{0}}$ $\not{1}$ $\not{2}$ $\not{3}$ $\not{4}$ $\not{8}$ $\not{6}$ 7

Key $\boxed{20}$ $\not{2}$ $\not{3}$ $\not{0}$ $\not{11}$ $\not{17}$ $\not{10}$ 7

| 1 | 0 | 2 | 3 | 7 | 10 | 11 | 17 | 19 | 20 | Fully Sorted

Binary Search

Find 20 , use L, R, M   Midpoint $\dfrac{L+R}{2} = 4$

  L   M   R
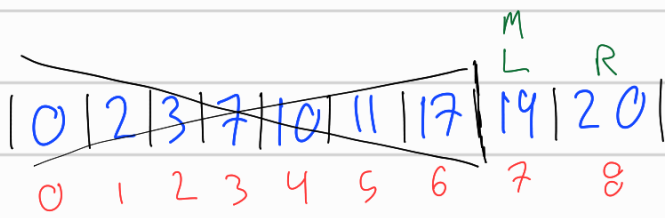| 1 | 0 | 2 | 3 | 7 | 10 | 11 | 17 | 19 | 20 | L $\boxed{0}$ M $\boxed{4}$ R $\boxed{8}$
  0   1   2   3   4   5   6   7   8

                    a[M] $\boxed{10}$ L < M < R
                                        0   10   20

                  L m   R
| ~~0~~ | ~~2~~ | ~~3~~ | ~~7~~ | ~~10~~ | 11 | 17 | 19 | 20 | L $\boxed{\not{0}}$ 5   M $\boxed{\not{4}}$ 6   R $\boxed{8}$
  ~~0~~ ~~1~~ ~~2~~ ~~3~~ ~~4~~ 5   6   7   8

                    a[M] $\boxed{\not{10}}$ 17   L < M < R
                                        11   17   20

L $\boxed{\varnothing}$ $\cancel{8}$ 7 M $\boxed{\cancel{4}}$ $\cancel{6}\cancel{7}$ R $\boxed{8}$

a[M] $\boxed{\cancel{10}}$ $\cancel{17}$ 19   L=M<R
                                              19   20
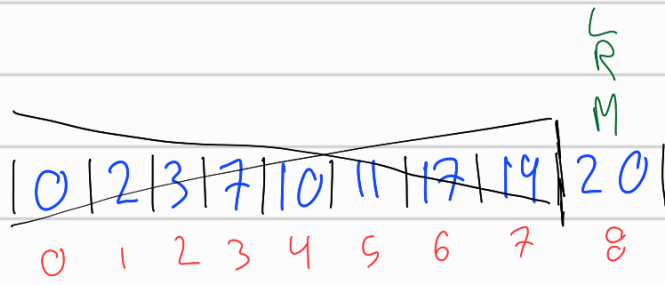
L $\boxed{\varnothing}$ $\cancel{8}$ 8 M $\boxed{\cancel{4}}$ $\cancel{6}$ 8 R $\boxed{8}$

a[M] $\boxed{\cancel{10}}$ $\cancel{17}$ 20

Target found: 20 at position 8 using 3 comparisons