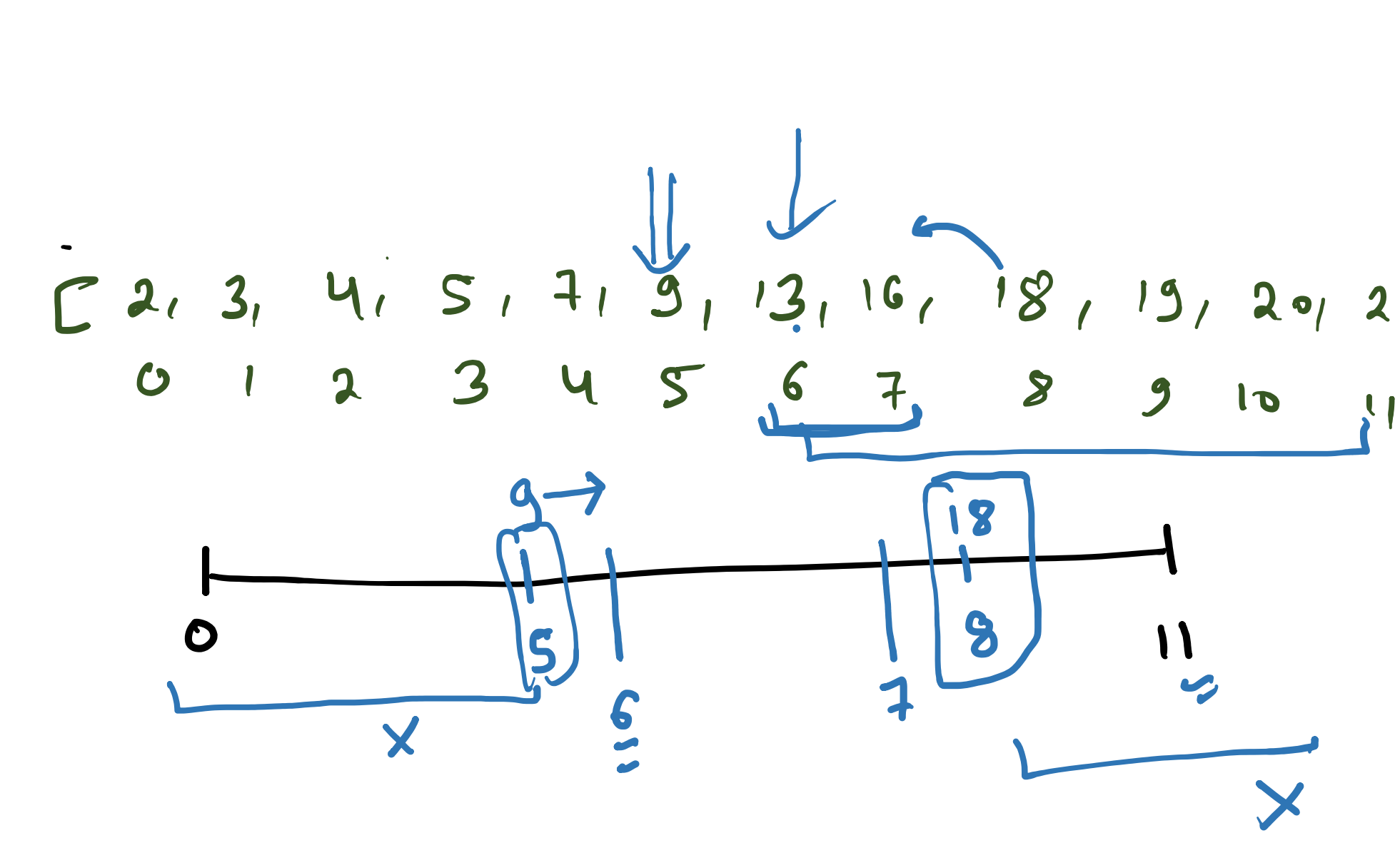
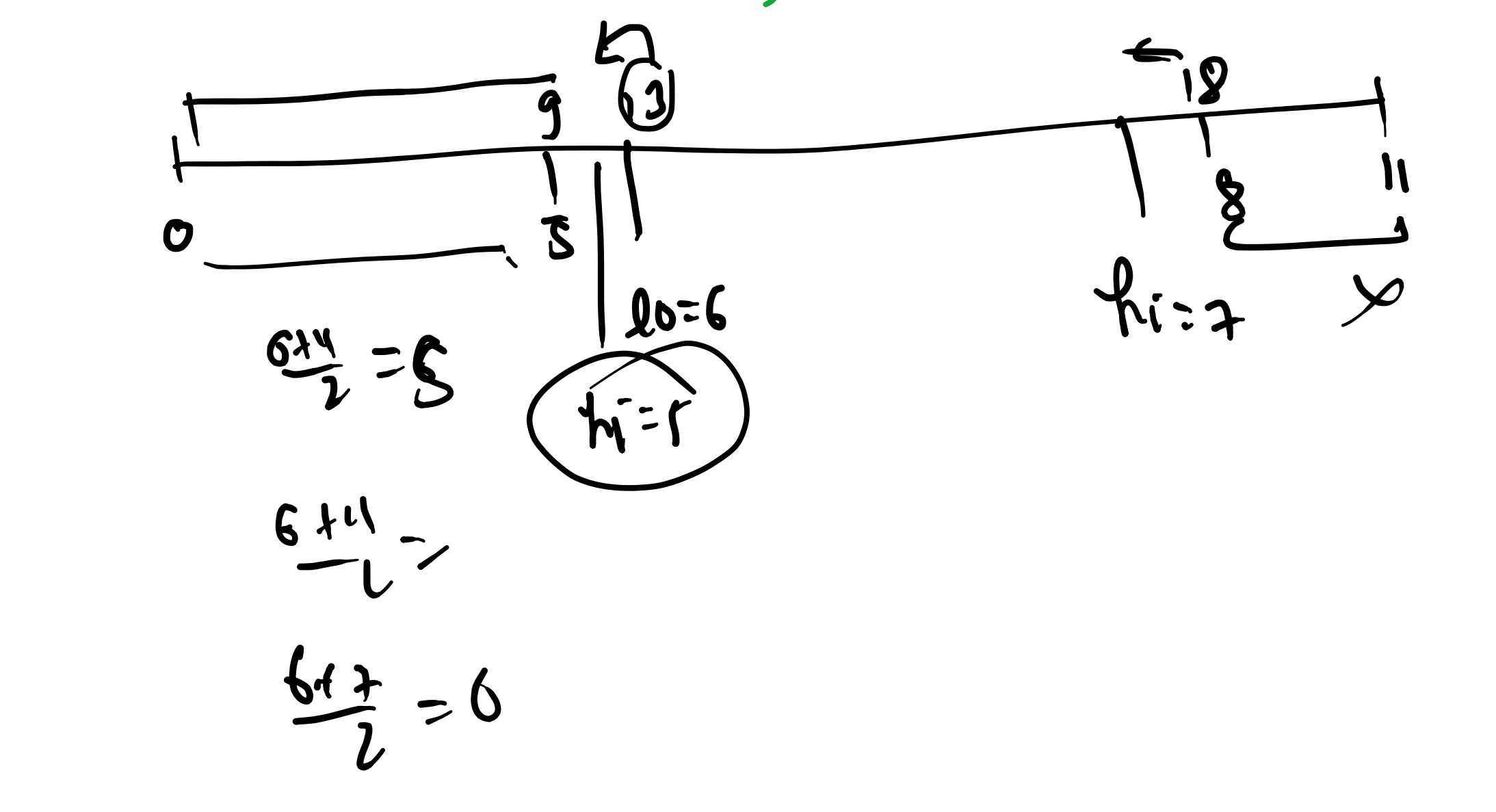
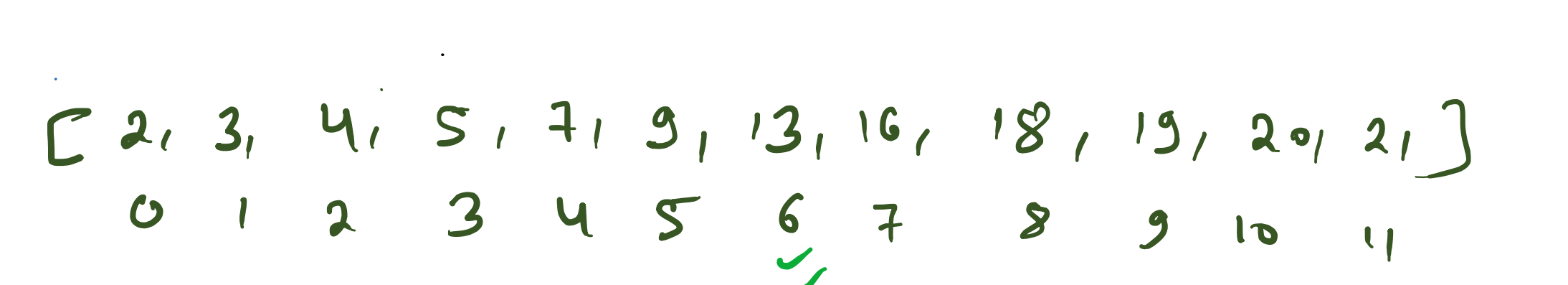


Noida see-15  
7 to 8  
Binary Search



13 finder  
 $\frac{0+11}{2} = 5$   
 $\frac{5+11}{2} = 8$   
 $\frac{6+7}{2} = 6$



while (lo < hi) {  
int mid = (lo+hi)/2;  
if (arr[mid] == item) {  
return mid;  
}  
else if (arr[mid] > item) {  
hi = mid-1;  
}  
else {  
lo = mid+1;  
}  
}  
return -1

$2^k = N$   
 $2^1 = 2$   
 $2^2 = 4$   
 $2^3 = 8$   
 $2^4 = 16$   
 $2^5 = 32$   
 $2^6 = 64$   
 $2^7 = 128$   
 $2^8 = 256$   
 $2^9 = 512$   
 $2^{10} = 1024$   
 $2^{11} = 2048$   
 $2^{12} = 4096$   
 $2^{13} = 8192$   
 $2^{14} = 16384$   
 $2^{15} = 32768$   
 $2^{16} = 65536$   
 $2^{17} = 131072$   
 $2^{18} = 262144$   
 $2^{19} = 524288$   
 $2^{20} = 1048576$   
 $2^{21} = 2097152$   
 $2^{22} = 4194304$   
 $2^{23} = 8388608$   
 $2^{24} = 16777216$   
 $2^{25} = 33554432$   
 $2^{26} = 67108864$   
 $2^{27} = 134217728$   
 $2^{28} = 268435456$   
 $2^{29} = 536870912$   
 $2^{30} = 1073741824$   
 $2^{31} = 2147483648$   
 $2^{32} = 4294967296$   
 $2^{33} = 8589934592$   
 $2^{34} = 17179869184$   
 $2^{35} = 34359738368$   
 $2^{36} = 68719476736$   
 $2^{37} = 137438953472$   
 $2^{38} = 274877906944$   
 $2^{39} = 549755813888$   
 $2^{40} = 1099511627776$   
 $2^{41} = 2199023255552$   
 $2^{42} = 4398046511104$   
 $2^{43} = 8796093022208$   
 $2^{44} = 17592186044416$   
 $2^{45} = 35184372088832$   
 $2^{46} = 70368744177664$   
 $2^{47} = 140737488355328$   
 $2^{48} = 281474976710656$   
 $2^{49} = 562949953421312$   
 $2^{50} = 1125899906842624$   
 $2^{51} = 2251799813685248$   
 $2^{52} = 4503599627370496$   
 $2^{53} = 9007199254740992$   
 $2^{54} = 18014398509481984$   
 $2^{55} = 36028797018963968$   
 $2^{56} = 72057594037927936$   
 $2^{57} = 144115188075855872$   
 $2^{58} = 288230376151711744$   
 $2^{59} = 576460752303423488$   
 $2^{60} = 1152921504606846976$   
 $2^{61} = 2305843009213693952$   
 $2^{62} = 4611686018427387904$   
 $2^{63} = 9223372036854775808$   
 $2^{64} = 18446744073709551616$   
 $2^{65} = 36893488147419103232$   
 $2^{66} = 73786976294838206464$   
 $2^{67} = 147573952589676412928$   
 $2^{68} = 295147905179352825856$   
 $2^{69} = 590295810358705651712$   
 $2^{70} = 1180591620717411303424$   
 $2^{71} = 2361183241434822606848$   
 $2^{72} = 4722366482869645213696$   
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 $2^{75} = 37778931862957161709568$   
 $2^{76} = 75557863725914323419136$   
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 $2^{80} = 1208925819614629174706176$   
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 $2^{85} = 38685626227668133590597632$   
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