

Insertion (shifting)

$O(n^2)$

for $\rightarrow n$
for $\rightarrow n$

temp = 2

skipping

Selection (swap)

$O(n^2)$

for $\rightarrow n$
for $\rightarrow n$

1st pass

2nd pass

3rd pass

4th pass

5th pass

6th pass

7th pass

8th pass

9th pass

10th pass

11th pass

12th pass

13th pass

14th pass

15th pass

16th pass

17th pass

18th pass

19th pass

20th pass

21st pass

22nd pass

23rd pass

24th pass

25th pass

26th pass

27th pass

28th pass

29th pass

30th pass

31st pass

32nd pass

33rd pass

34th pass

35th pass

36th pass

37th pass

38th pass

39th pass

40th pass

41st pass

42nd pass

43rd pass

44th pass

45th pass

46th pass

47th pass

48th pass

49th pass

50th pass

51st pass

52nd pass

53rd pass

54th pass

55th pass

56th pass

57th pass

58th pass

59th pass

60th pass

61st pass

62nd pass

63rd pass

64th pass

65th pass

66th pass

67th pass

68th pass

69th pass

70th pass

71st pass

72nd pass

73rd pass

74th pass

75th pass

76th pass

77th pass

78th pass

79th pass

80th pass

81st pass

82nd pass

83rd pass

84th pass

85th pass

86th pass

87th pass

88th pass

89th pass

90th pass

91st pass

92nd pass

93rd pass

94th pass

95th pass

96th pass

97th pass

98th pass

99th pass

100th pass

Repetitive Swapping:

For n values
n-1 iterations
passes

Searching:

Linear Search $\rightarrow O(n)$
Binary Search $\rightarrow O(\log n)$
Recursive Binary Search $O(\log n)$
Jump Search $O(\sqrt{n})$
Interpolation Search \rightarrow pos or index

Sorting:

1) Bubble
2) Selection
3) Insertion
4) Merge
5) Quick
6) Heap Sort
7) Count Sort
8) Radix Sort
9) Shell Sort
10) Wave Sort

Operators:

Arithmetic $\rightarrow +, -, /, *, \%$
Assignment $\rightarrow =, +=, -=, ...$
Relational/Comparison $\rightarrow >, <, >=, <=, ==, !=$
Logical $\rightarrow \&\&, \|\|, !$
Ternary Operator (Condition) $? \text{true value} : \text{false value} ;$
Unary Operators | Prefix | Postfix $++$

Bitwise Operators:

AND $\&$
OR $|$
XOR \wedge
Right Shift $>>$
Left Shift $<<$
NOT \sim

Bit Masking/Manipulation

Bitwise Shift Operations:

a = 10
step/unit = 2

10 << 2

10 >> 2

Bitwise NOT:

5 $\rightarrow 0101$
 $\sim 5 \rightarrow 1010 = 10$
prove that $\sim 5 = 10$
MCQ: ~ 5
a) 5
b) 4
c) 10
d) -6

Printing Patterns:

Right Angle Triangle:
n = 5

1 to 5 rows
for (1 to n)
for (1 to row No)
print (*)
print("\n")

Logic 1:

row = 3
col = 9, 13, 17, 21, 25

Logic 2

Hamming Weight:

n = 11 (integer) Bin X
n = 11 $\rightarrow 1011$
C = 0
++ 1
++ 2
++ 3

while (n > 0) TCs

Logic 2:

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col = 9, 13, 17, 21, 25

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