1. 3 main parts of a recursive algorithm:
   1. The algorithm calls itself with each recursion
   2. The algorithm must have a base case where it starts returning an output
   3. The algorithm decreases its data size with each recursion as it moves towards the base case
2. static int factorial(int n)

{

If (n == 1)

{

Return 1;

}

Return n \* factorial(n – 1);

}

Push

Push

Main()  
findMax( {19, 2, 21, 20, 3}, 4)

Returns 21

Main()  
findMax( {19, 2, 21, 20}, 3)

Returns 21

Main()  
findMax( {19, 2, 21}, 2)

Push

Returns 19

Returns 19

Main()  
findMax( {19, 2} , 1)

Push

Non-recursive base reached

Main()  
findMax( {19}, 0)

11

9

6

5

3

3

2

0

6

9

3

0

11

5

3

2

3

0

9

6

11

3

5

2

3

0

6

9

3

11

2

5

0

3

9

6

5

2

11

3

5

2

11

3

3

0

6

9

11

3

0

6

9

3

2

5

1. The stages of the merge sort algorithm are “divide” and “conquer”. The data is split into two parts until only a single item remains. Then the data is reassembled in order until all data has been sorted.