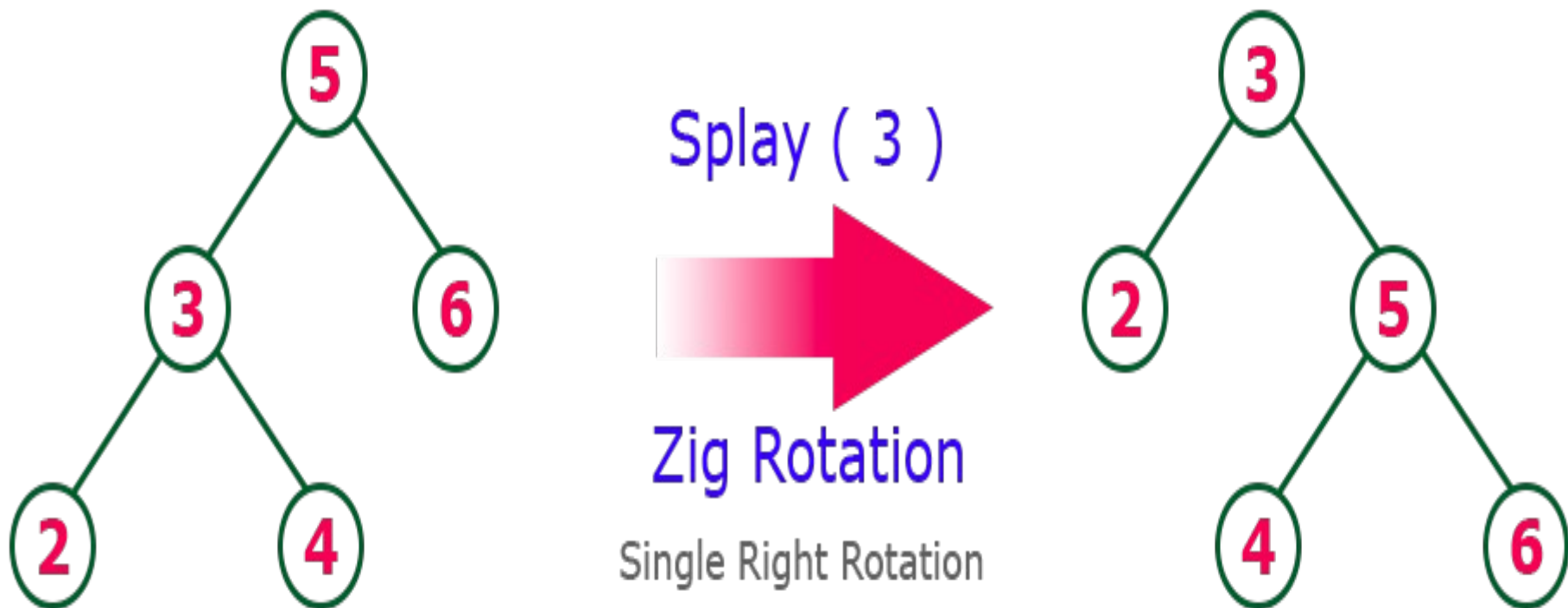# Splay Tree

# Splay Tree Datastructure

- Splay Tree is a self - adjusted Binary Search Tree in which every operation on element rearranges the tree so that the element is placed at the root position of the tree.

- Splaying an element is the process of bringing it to the root position by performing suitable rotation operations.

# Rotations in Splay Tree

1. Zig Rotation

2. Zag Rotation

3. Zig - Zig Rotation

4. Zag - Zag Rotation

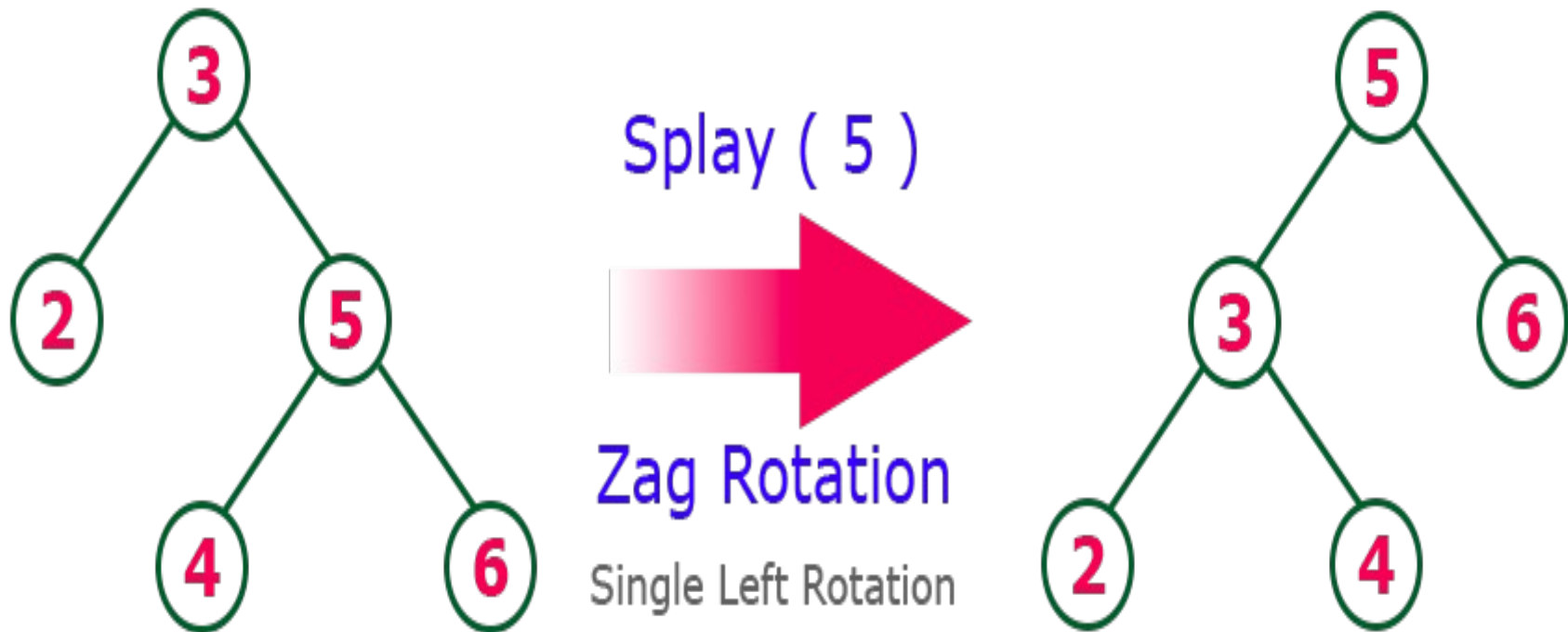5. Zig - Zag Rotation

6. Zag - Zig Rotation

# Zig Rotation

The Zig Rotation in splay tree is similar to the single right rotation in AVL Tree rotations. In zig rotation, every node moves one position to the right from its current position. Consider the following example...
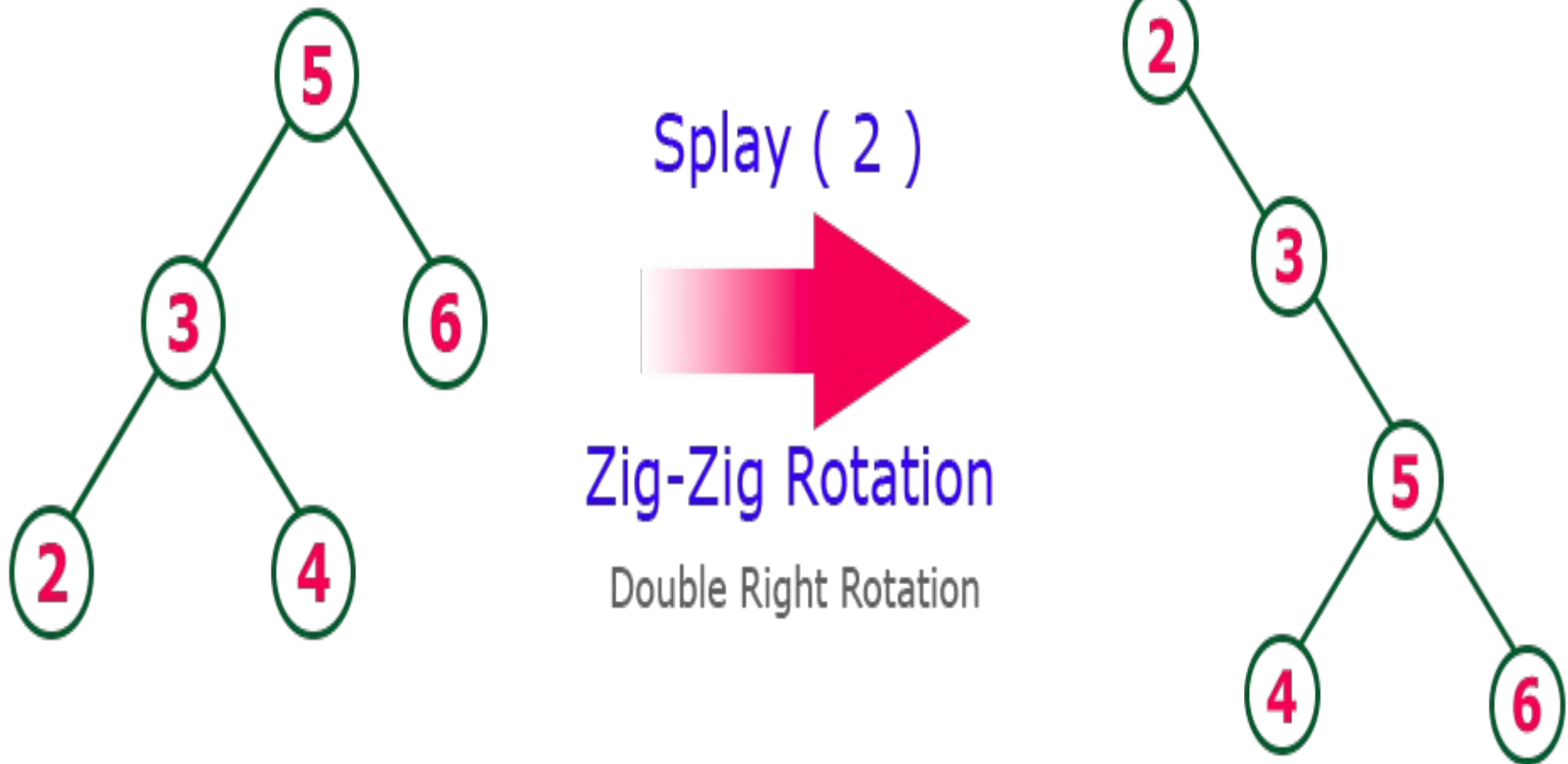
# Zag Rotation

The Zag Rotation in splay tree is similar to the single left rotation in AVL Tree rotations. In zag rotation, every node moves one position to the left from its current position. Consider the following example...
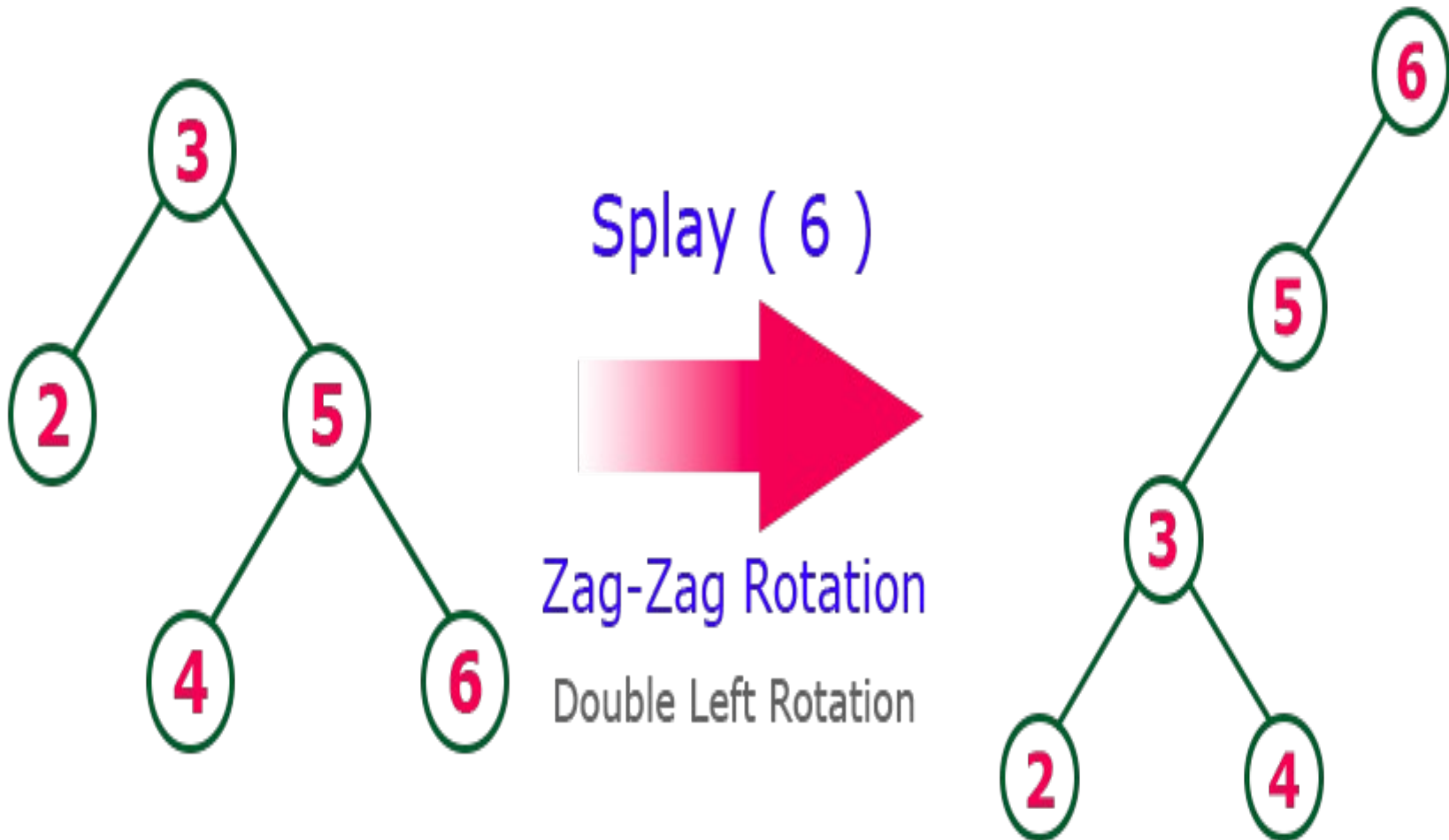
# Zig-Zig Rotation

The Zig-Zig Rotation in splay tree is a double zig rotation. In zig-zig rotation, every node moves two positions to the right from its current position. Consider the following example...



Splay ( 2 )

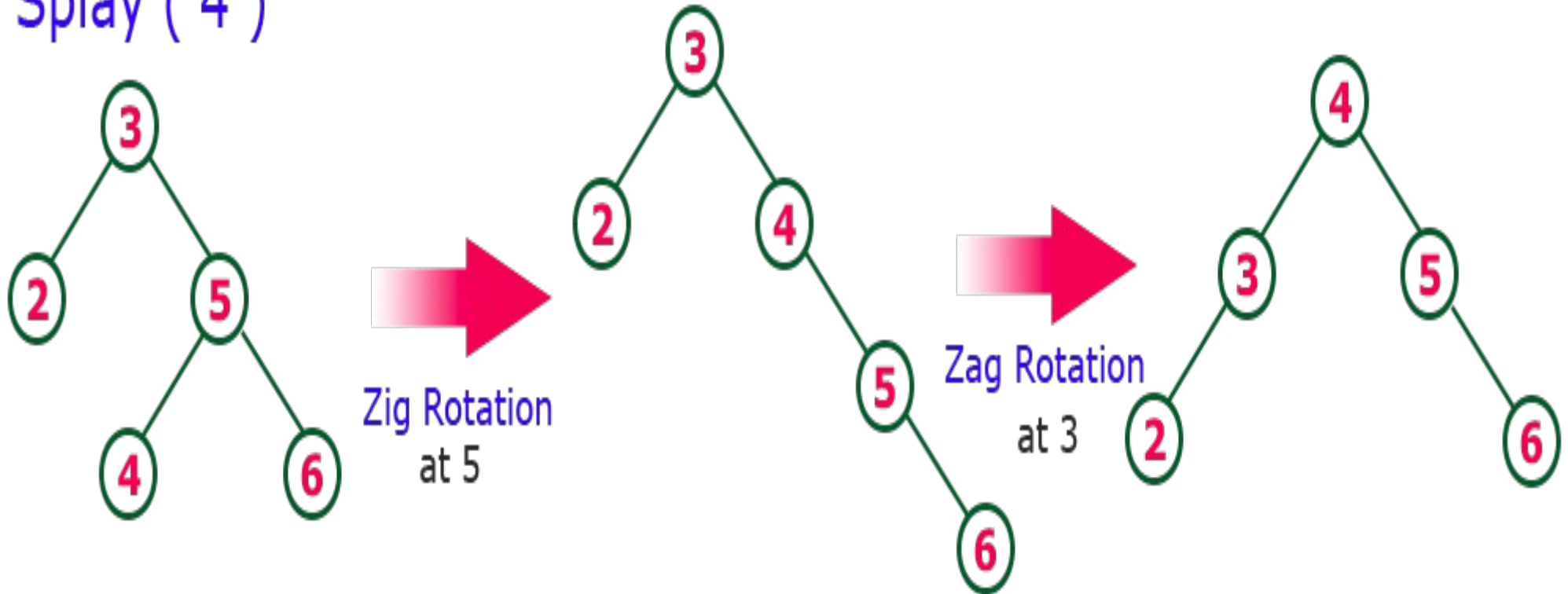Zig-Zig Rotation

Double Right Rotation

# Zag-Zag Rotation

The Zag-Zag Rotation in splay tree is a double zag rotation. In zag-zag rotation, every node moves two positions to the left from its current position. Consider the following example...

# Zig-Zag Rotation

The Zig-Zag Rotation in splay tree is a sequence of zig rotation followed by zag rotation. In zig-zag rotation, every node moves one position to the right followed by one position to the left from its current position. Consider the following example...

# Zag-Zig Rotation

The Zag-Zig Rotation in splay tree is a sequence of zag rotation followed by zig rotation. In zag-zig rotation, every node moves one position to the left followed by one position to the right from its current position. Consider the following example...
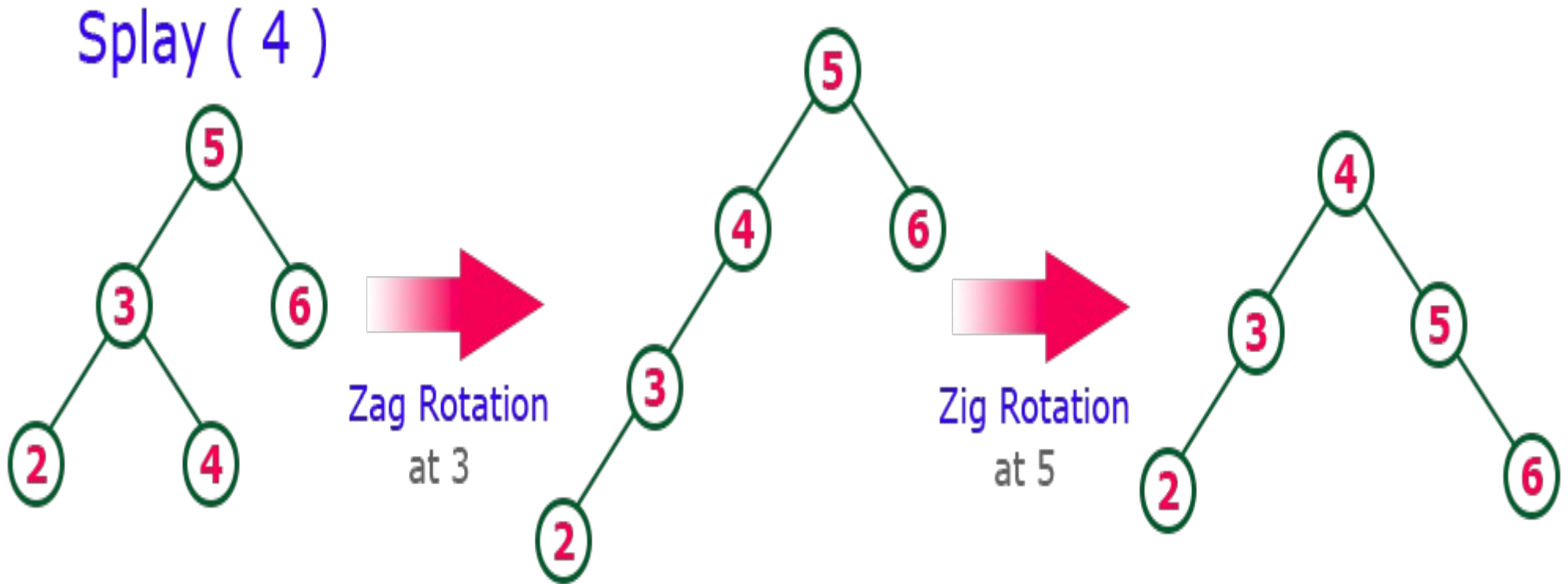
# Insertion

Step 1 - Check whether tree is Empty.

Step 2 - If tree is Empty then insert the newNode as Root node and exit from the operation.

Step 3 - If tree is not Empty then insert the newNode as leaf node using Binary Search tree insertion logic.

Step 4 - After insertion, Splay the newNode

# Deletion

The deletion operation in splay tree is similar to deletion operation in Binary Search Tree. But before deleting the element, we first need to splay that element and then delete it from the root position. Finally join the remaining tree using binary search tree logic.