

# Verifying Robustness of Programs Under Structural Perturbations

Clay Thomas and Jacob Bond

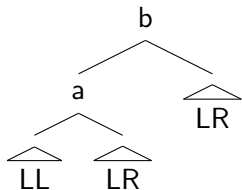
November 27, 2017

# Motivation

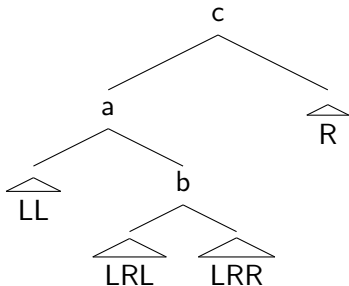
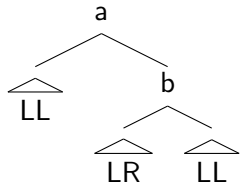
# Lists

asdf

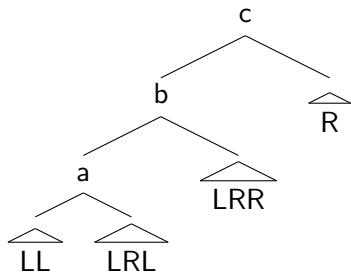
# Binary Search Trees



rotate  
→



flatten  
→



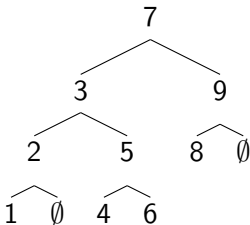
# Binary Search Trees

It suffices to show

- Every tree can be transformed into a “normal form” (i.e. list)
- Every operation is reversible

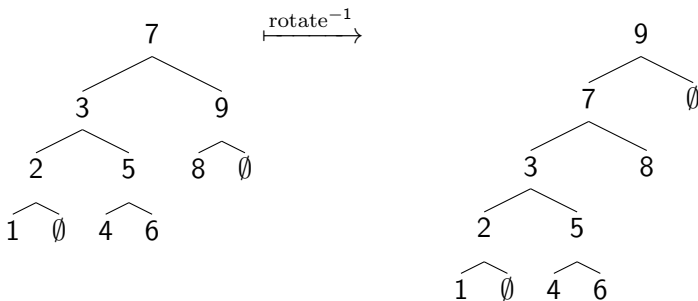
## Binary Search Trees – Proof by example

- Every tree can be transformed into a “normal form” (i.e. list)



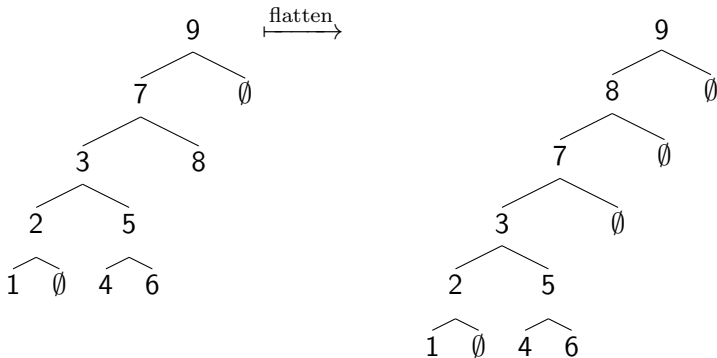
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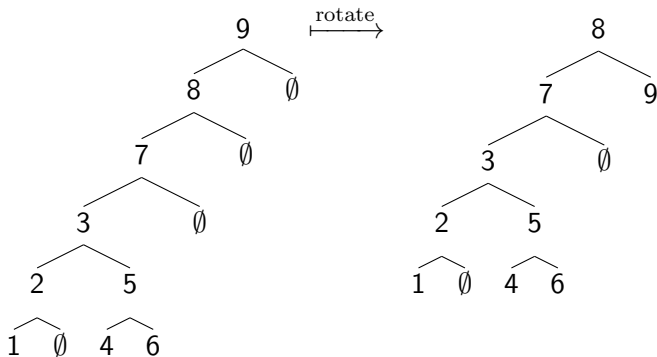
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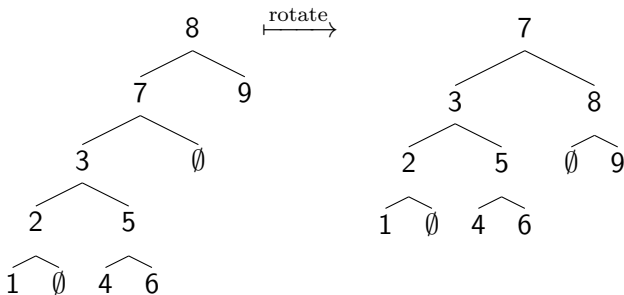
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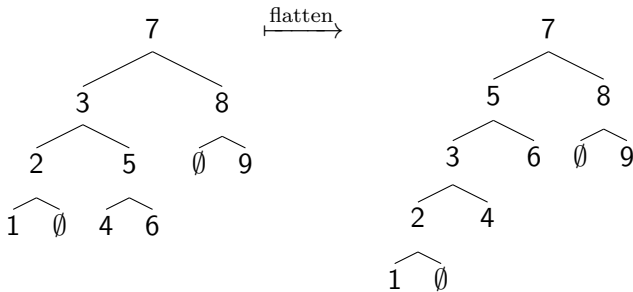
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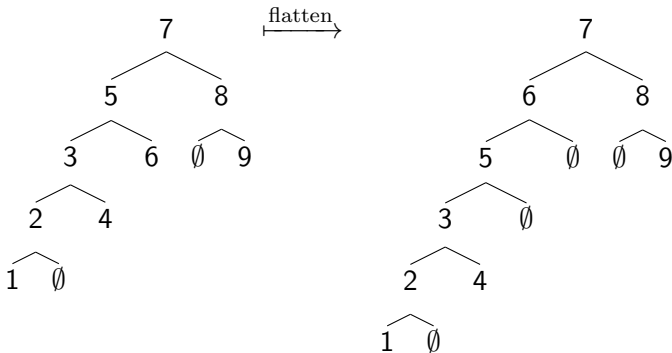
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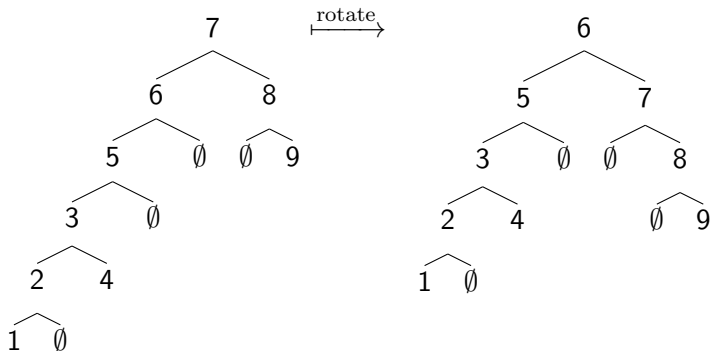
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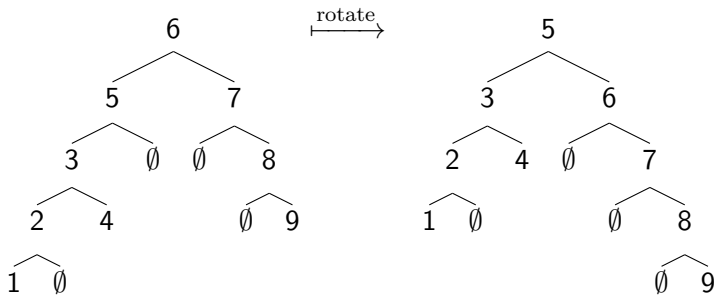
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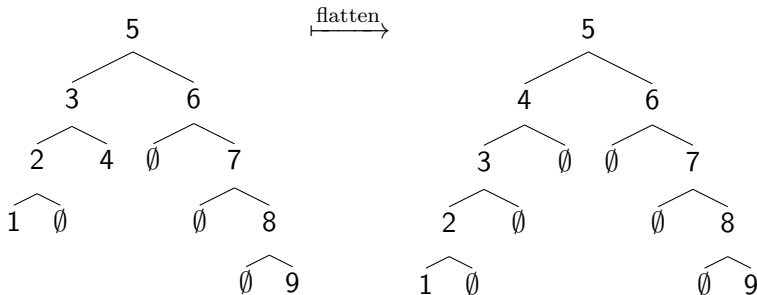
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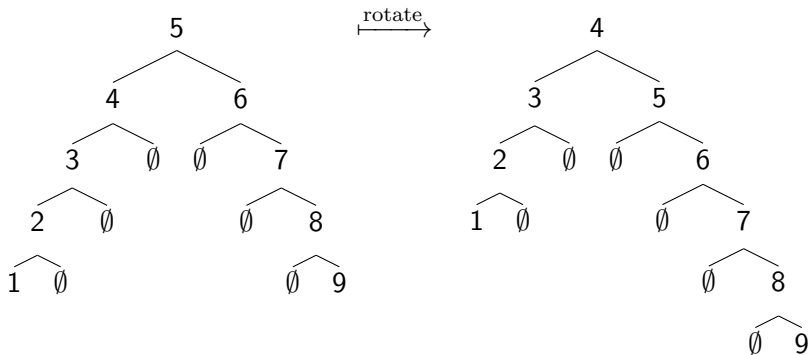
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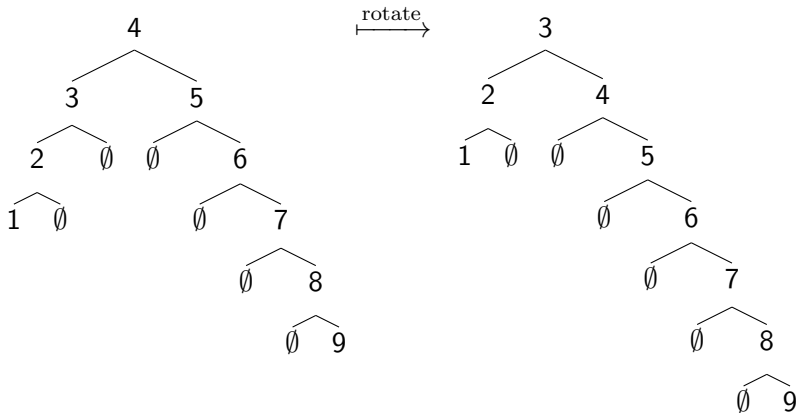
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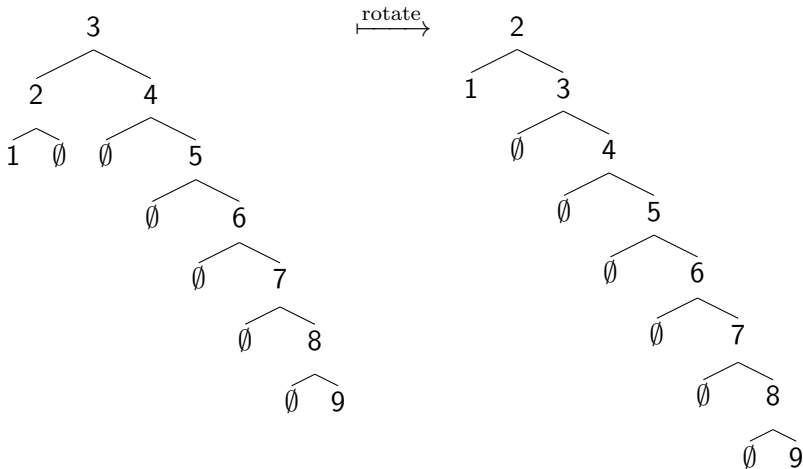
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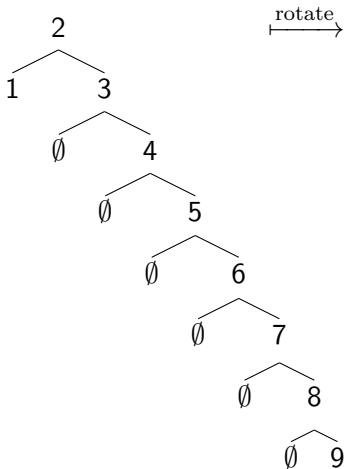
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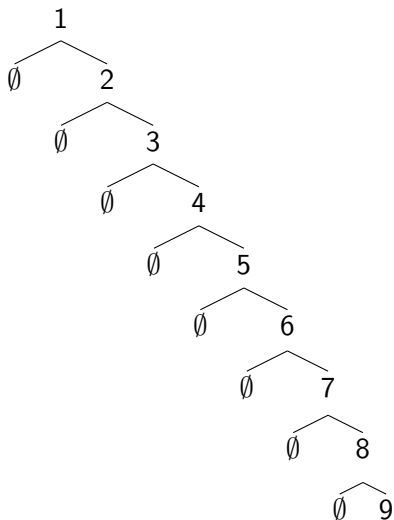


## Binary Search Trees – Proof by example

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rotate  $\longrightarrow$



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