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ADS-Lab - B-Tree.

B-Tree insertion

```
BTreeInsertion (T, k)
x ← root[T]
if n[x] = 2t - 1
    s = AllocateNode()
    root[T] = s
    leaf[s] = False
    n[s] ← 0
    c1[s] ← x
    BTreeSplitChild(s, 1, x)
    BTreeInsertNonFull(s, k)
else BTreeInsertNonFull(x, k)
BTreeInsertNonFull(x, k)
i = n[x]
if leaf[x]
    while i ≥ 1 and k < keyi[x]
        keyi+1[x] = keyi[x]
        i = i - 1
    keyi+1[x] = k
    n[x] = n[x] + 1
else while i ≥ 1 and k < keyi[x]
    i = i - 1
i = i + 1
```

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```
if n[ci[x]] == 2t-1
        Btree Split Child (x, i, ci[x])
        if k > key_i [x]
            i = i+1
    ~~Btree~~
    Btree Insert-Nonfull (ci[x], k)
Btree Split Child (x, i)
Btree Split Child (x, i, y)
z = AllocateNode ()
leaf [z] = leaf [y]
n[z] = t - 1
for j=1 to t-1
        key j[z] = key[j + t [y]
if not leaf [y]
        for j=1 to t
            cj [z] = cj + t[y]
n [y] = t-1
    for j = n[x] +1 to i+1
        cj + 1[x] = cj[x]
    ci + 1 [x] = z
    for j = n[x] to i
        ~~keyi[x] = key t[y]~~  key j + 1[x] = key j [x]
    keyi (x) = key t[y]
    n[x] = n[x] + 1
```