TI DSP, MCU, Xilinx Zynq FPGA Based Programming Expert Program

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Binary Search Tree(BST)

Non-recursive insertion algorithm :

I thought all nodes in the insert path be saved in stack. It was right. But, I can't finish the algorithm until today. I was obsessed with pushing single pointer. Today, I modified push function's second parameter (avl* data -> void* data) and applied type cast(avl**) to void pointer.

But I'm still a little confused why I should use double pointer. So I memorized that code and analyzed it.

```
void avl_ins(avl** root,element data){
    avl** tmp = root;
    stack* top = NULL;
    int chk;
    while(*tmp){
        printf("%d push!!\n",(*tmp)->data);
        push(&top,tmp);
        if(data < (*tmp)->data)
            tmp = &(*tmp)->left;
        else if(data > (*tmp)->data)
            tmp = &(*tmp)->right;
    }
    *tmp = get_avl_node();
    (*tmp)->data = data;
    while(Is_not_empty(&top)){
        avl** t = (avl**)pop(&top);
        (*t)->lev = update_level(*t);

        chk = rot_chk(*t);
        if(abs(chk) > 1){
            (*t) = rotation((*t),kinds_of_rot(*t));
            printf("rotate!!\n");
        }
    }
}
```

am

Null | root
2000 (1000).

vl_ins

1000 root (10000) 1000 tmp (20000)

vl_ins

1000 root (10,000) 1000 tmp (20,000)
2008

avl_ins.

1000 root (10,000) 1000 tmp (20,000)
2008
3008

30 t
3000 (100)

rotate

tmp 2000 tmp
3000

vot_rr

2000 tmp 2008 root
2008
3000

30 2000
NULL

60 3000
2000 3008

70 4000

2000

50 push!

3000
2000

50 push!

60 push!

↓

50 push!

50 push!

60 push!

rotate!

50

main 끝

root
2000 (1000)

avl_ins.

1000 tmp (10,000) 1000 root (20000)

avl_ins.

1000 tmp (10000) 1000 root (20000)

2008 ~~2008~~

avl_ins

1000 tmp (10,000) 1000 root (20,000)

2008
3008.

avl_ins

1000 tmp (10000) 1000 root (20000)

2008 t (30000)

1000

50
2000

60
3000

120
4000

2000

50 push!

50 push!
60 push!.

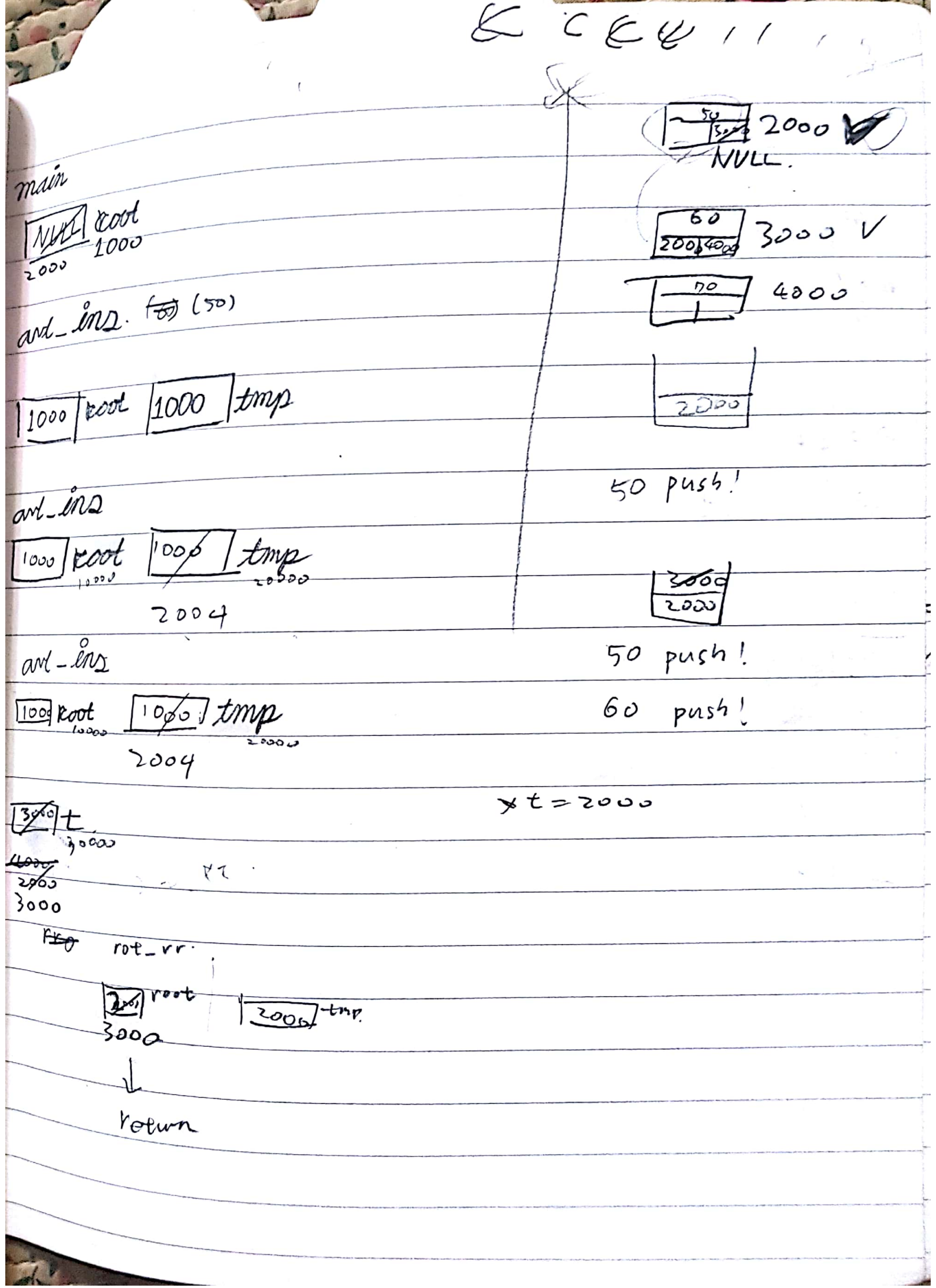
50 push!.

rotate

1000 root. tmp

rot_rr

1000 root 1000 tmp



"555"

main

NULL root
2000 1000.
a 3000

avl_ins.

1000 root 1000 tmp

a

avl_ins.

1000 root 1000 tmp
2004.

avl_ins

1000 root 1000 tmp
2004
3004.

a 2004 t.
1000

*t = 3000;