A Simple Binary Search Tree Node Class
Version 1a

The *TNODE* module

This module defines a simple search tree node that can be adapted for more sophisticated uses (say, a self-balancing tree) with a minimum of code rewrites.

Here is a conforming *tnode.h* file:

```
#ifndef __TNODE_INCLUDED__
#define __TNODE_INCLUDED__

#include <stdio.h>

typedef struct tnode TNODE;

extern TNODE *newTNODE(void *v,TNODE *l,TNODE *r,TNODE *p);
extern void   setTNODEdisplay(TNODE *n,void (*d)(void *value,FILE *fp));
extern void   setTNODEfree(TNODE *n,void (*f)(void *value));
extern void  *getTNODEvalue(TNODE *n);
extern void   setTNODEvalue(TNODE *n,void *replacement);
extern TNODE *getTNODEleft(TNODE *n);
extern void   setTNODEleft(TNODE *n,TNODE *replacement);
extern TNODE *getTNODEright(TNODE *n);
extern void   setTNODEright(TNODE *n,TNODE *replacement);
extern TNODE *getTNODEparent(TNODE *n);
extern void   setTNODEparent(TNODE *n,TNODE *replacement);
extern void   displayTNODE(TNODE *n,FILE *fp);
extern int    debugTNODE(TNODE *n,int level);
extern void   freeTNODE(TNODE *n);

#endif
```

The TNODE structures and methods should all be placed in *tnode.c.*

Here are some of the behaviors your methods should have. This listing is not exhaustive; you are expected, as a computer scientist, to complete the implementation in the best possible and most logical manner.

- *newTNODE* - The constructor is passed a value and three *TNODE* pointers: the left, right, and parent pointers, respectively.
- *displayTNODE* - If the display method is not set, the address of the value is printed with a preceding ampersand.
- *debugTNODE* - If the debug level is set to greater than zero, the display method prints an ampersand and then the address of the node immediately after displaying the value (with no intervening or following spaces.

The only local includes the *TNODE* module should have are *tnode.h*.

Assertions

Include the following assertions in your methods:

- *newTNODE* - The memory allocated shall not be zero.

Testing your TNODE class

Modify the testing program found in the *dynamic-array class description* to work with a binary search tree node.

Change log

1a	changed return type of setTNODEdisplay/setTNODEfree to void
	changed return type of debugTNODE to int