

Computer Programming: Skills and Concepts

Tutorial 8 (Tue 21 Nov – Fri 24 Nov)

Pointer revision

Consider the following functions with the following `main`. Describe the relationships between integer-values and pointer-values from the various `printf` statements (including those called from within the functions).

What is the difference between variables `n` and `m`?

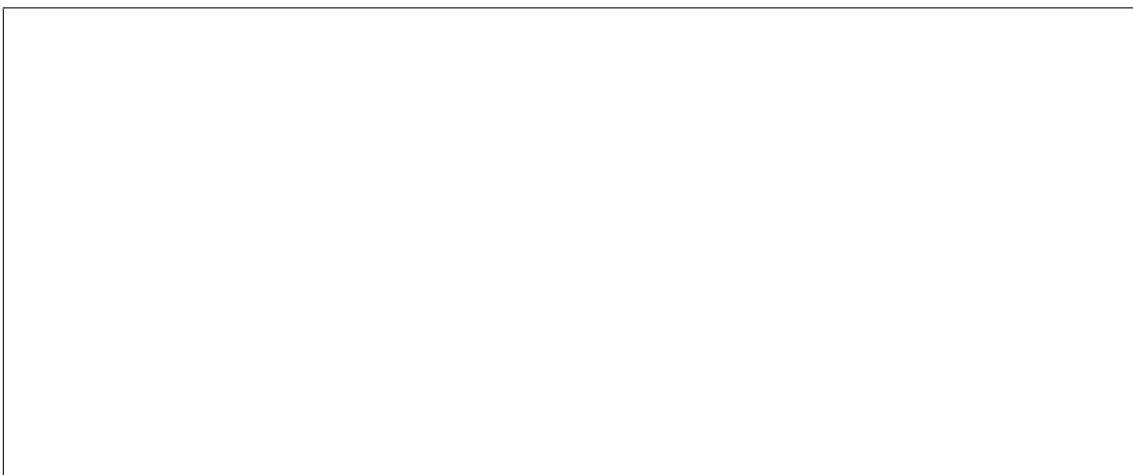
How does it manifest itself during the running of the code?

```
void addressOnly(int n) {
    printf("addressOnly: address of parameter-var n is %p, val %d.\n", &n, n);
}

void valueOfPoint(int *p) {
    printf("valueOfPoint: value of pointer p is %p, points to val %d.\n", p, *p);
}

int m=8;

int main(void) {
    int n=5;
    printf("main: val of n is %d, address of n is %p.\n", n, &n);
    addressOnly(n);
    printf("main: Passing &n into valueOfPoint.\n");
    valueOfPoint(&n);
    printf("\n");
    printf("main: val of m is %d, address of m is %p.\n", m, &m);
    addressOnly(m);
    printf("main: Passing &m into valueOfPoint.\n");
    valueOfPoint(&m);
    return EXIT_SUCCESS;
}
```



Arrays and Functions Revision

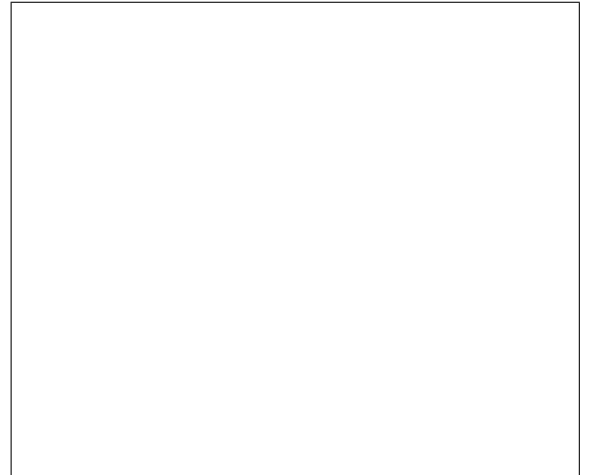
Consider the following code:

```
void max(int x[],int y[], int z[], int n) {
    int i;
    for(i=0; i<n;i++)
        if( x[i]>y[i] )
            z[i] = x[i];
        else
            z[i] = y[i];
}

int main(void) {
    int i, a[10], b[10], c[10];
    for(i=0; i<10; i++) {
        a[i] = 10*i;
        b[i] = 100-10*i;
    }
    max(a,b,c,10);
    return EXIT_SUCCESS;
}
```

What are the values of $c[0]$, ..., $c[9]$?

discuss: What would happen if we wrote $\text{max}(a,b,c,8)$ instead of $\text{max}(a,b,c,10)$?
... if we wrote $\text{max}(a,b,c,12)$?



Programming with files and arguments

Write a program which takes two arguments, interprets them as file names, and then prints the two files side by side, so that line n of the output has line n of file1 on the left and followed by line n of file2 on the right. You should truncate the lines to 40 characters, and pad the file1 half-lines up to 40 characters, so that everything lines up nicely. (**Optional:** Generalize it so that it takes any number of file arguments, and prints them all side by side, assuming the “terminal” is 80 columns wide.)

