

C File Processing in Practice

CS 2060

Prof. Jonathan Ventura

Options files

- One common use for file I/O is option / parameter files:

```
name donut  
calories 380  
fat 18
```

- How would we read this data into a NutritionInfo structure?

Options files

```
FILE *f = fopen("donut.txt","r");

Nutritioninfo donut;
while (!feof(f) ) {
    char param[1024];
    if ( fscanf(f,"%1023s",param) != 1 ) break;
```

Options files

```
if ( strcmp(param,"name") == 0 ) {  
    fscanf(f, " %15s", donut.name);  
}
```

Options files

```
else if ( strcasecmp(param,"calories") == 0 ) {  
    fscanf(f, " %d",&donut.calories);  
}
```

Options files

```
else if ( strcasecmp(param,"fat") == 0 ) {  
    fscanf(f," %d",&donut.fat);  
}
```

Options files

```
else {  
    printf("Unrecognized parameter: %s\n",param);  
}
```

Structures for file formats

- Files typically have a fixed header structure with metadata about the file.
- A `struct` can be used to represent this header and to read it from or write it to a file.
- For example, JPEG, PNG, or any other image file format will have some type of pre-defined header.

MD2 Model Format

- MD2 is a 3D model format used by the Quake II engine.



MD2 Model Format

- The MD2 header has the following format:

Offset	Data type	Name	Description
0	int	ident	Magic number. (IDP2)
4	int	version	MD2 version. (8)
8	int	skinwidth	Width of the texture
12	int	skinheight	Height of the texture
16	int	framesize	Size of one frame in bytes
20	int	num_skins	Number of textures
24	int	num_xyz	Number of vertices
28	int	num_st	Number of texture coordinates
32	int	num_tris	Number of triangles
...

MD2 Model Format Header in Struct

- We can represent this using a struct:

```
struct MD2Header {  
    int ident;           // Magic number  
    int version;        // MD2 version  
    int skinwidth;      // Width of the texture  
    int skinheight;    // Height of the texture  
    int framesize;     // Size of one frame in bytes  
    int num_skins;     // Number of textures  
    int num_xyz;       // Number of vertices  
    int num_st;        // Number of texture coordinates  
    int num_tris;     // Number of triangles  
};
```

MD2 Model Format Header in Struct

- Now we can easily read and write the header from a file:

```
struct MD2Header header;
```

```
// open file
```

```
f = fopen("model.md2", "r");
```

```
// read header from file
```

```
fread( &header, sizeof(MD2Header), 1, f );
```

```
// ...
```