16.216: ECE Application Programming

Summer 2012

Lecture 1: Key Questions
July 10, 2012

1. Describe the key components of the basic C program shown below. What is the output of this program?

```
#include <stdio.h>
int main()
{
     printf("Hello World!\n");
     return 0;
}
```

2. What is the output of each of the following variations on the basic program shown in Question 3?

a.

```
#include <stdio.h>
int main()
{
    printf("Hello");
    printf("there");
    printf("World!");
    return 0;
}
```

b.

```
#include <stdio.h>
int main()
{
    printf("Hello\n");
    printf("there\n");
    printf("World!\n");
    return 0;
}
```

c.

```
#include <stdio.h>
int main()
{
    printf("Hello\nthere\nWorld!\n");
    return 0;
}
```

3. Describe how to represent values in binary (base 2) and hexadecimal (base 16).

4. Explain how to convert values between decimal, binary, and hexadecimal.

5. **Example:** Perform the following base conversions:

a. $11_{10} = ?_2 = ?_{16}$

b. $37_{10} = ?_2 = ?_{16}$

c. $11_{16} = ?_{10}$

d. $0x2F = ?_2 = ?_{10}$

6. List the four basic data types in C, as well as the typical size and range of values for each. List some valid and invalid values for each type.

7. Explain how `#define` can be used to assign a symbolic name to a constant.

8. What are the four key characteristics of a variable?

9. What rules must be followed when naming variables?

10. Show how variables are declared and how values are assigned to them.