16.216: ECE Application Programming
Spring 2013

Lecture 9: Key Questions
February 13, 2013

1. Explain the usage and basic structure of a `while` loop.

2. **Example:** What does each of the following short programs print?

```
a. x = 7;
   while ( x < 10  )
   {
      printf("%d ",x);
      x = x + 1;
   }
```

```
b. x = 7;
   while ( x < 3  )
   {
      printf("%d ",x);
      x = x + 1;
   }
```

3. **Example:** Finish the following program as directed

```c
int main() {
    int i;                    // Number to square
    int iSquared;             // Square of the number
    printf(" i       i^2\n"); // Column headings


    // Compute and display the squares of numbers 0 to 10
    // Use a field width of 2 to print i and 10 to print i^2
    //   with no extra space between the fields












    return 0;
}
```

4. Explain how `while` loops can be used:
a. When number of iterations is dependent on a variable (flexible limit) (`while2.c`)

b. When you want to repeat an operation until a given value (sentinel) is entered
    (`while3.c`)

5. What is the difference between a `while` loop and a `do-while` loop?

6. Show the difference between the outputs of the loops below

```
x = 7;                              x = 7;
do {                                while ( x < 3  )
    printf("%d",x);                 {
    x = x + 1;                          printf("%d",x);
} while ( x < 3  );                     x = x + 1;
                                    }
```

7. Recall the example for using a while loop with a sentinel value in the grade average
    program and show that loop written as a `do-while` loop.