ECE-C301 Advanced Programming for Engineers
Laboratory Assignment: Week 6

Name: _____

(10 Points) The following table shows telephone area codes in the state of Georgia along with the largest city in each area:

Area Code	Major City
229	Albany
404	Atlanta
470	Atlanta
478	Macon
678	Atlanta
706	Columbus
762	Columbus
770	Atlanta
912	Savannah

Write a **switch** statement whose controlling expression is the variable **area_code**. If the value of **area_code** is in the table, the **switch** statement will print the corresponding city's name. Otherwise, the **switch** statement will display the message "Area code not found." Use **case** "fall throughs" in order to simplify the **switch** block as much as possible.

TA Initials _____

(20 Points) The following prime number test is not very efficient:

```c
int is_prime (int n)
{
    int d;

    for (d = 2; d < n; d++) {
        if (!(n % d))
            return 0;
    }

    return 1;
}
```

It is unnecessary to divide **n** by all numbers between 2 and **n** -1 to determine if it is prime. Only divisors up to $\sqrt{n}$ need to be checked. Make this change. Next, write a simple **main()** function that uses a **for-loop** and your improved implementation of **is_prime()** to compute the first 25 primes (starting with 2). Show your program to the TA.

<u>Note:</u> *Computing a square root takes much longer than computing a square. So, instead of computing* $\sqrt{n}$, *compare* $d \times d$ *with* n.

TA Initials _____