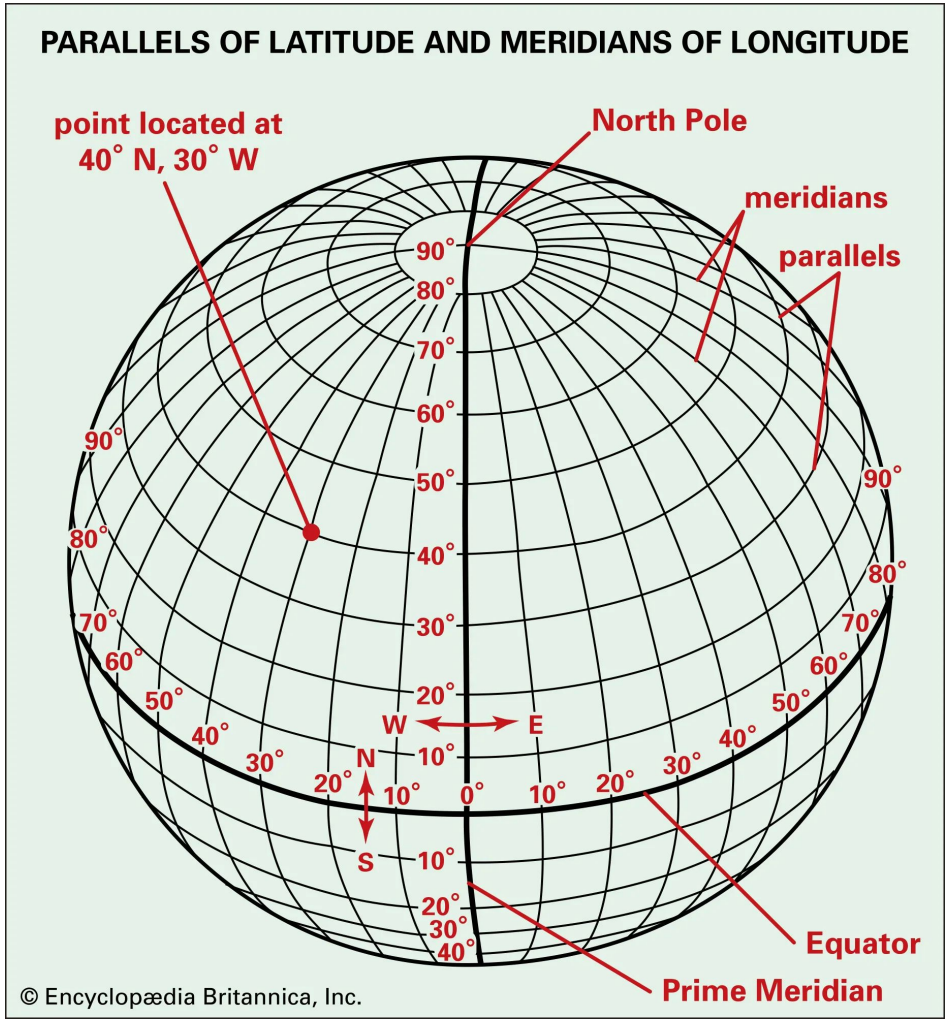
EE261 - Intro to C Programming

Prof Chuck Bland

Project Part 5



Coordinate System Basics

There is one more thing you need to know about coordinates in order to do calculations with them.

What is it?

Example Data Packets

KJ6OIL-10>APDR16,TCPIP*,qAC,T2BIO:=3446.47N/12030.51W$248/044/A=000284 https://aprsdroid.org/

KJ6OIL-10>APDR16,TCPIP*,qAC,T2BIO:=3438.39N/12026.84W$295/002/A=-00004 https://aprsdroid.org/

Appro 9 miles traveled

Assignment

Add the functionality to your program such that

1. **Filter for 1 callsign, KE6GYD-5**
2. Print call, location, distance moved since previous update.
3. Write func to calc distance moved.

Overall Program Outline

1. Open the file
2. While not at EOF
    a. Read a line
    b. If it contains “:=” and not “:`”
        i. Extract the callsign
        ii. If the callsign is KE6GYD-5
            1. Extract the coordinates
            2. First coordinates special case handling
            3. Calculate the distance between the last coordinates and the current coordinates
            4. Increment the packet counter
            5. Print the required output

Helpful Hints (honestly!)

1. Create two structure types
    a. Location - contains a Latitude and a Longitude
    b. Coord - contains degrees, minutes, and seconds
        i. Degrees would be negative where appropriate.
2. Write at least two functions
    a. Pass coord string, return pointer to struct of coords
    b. Pass two coord structs, return the distance between them

```
struct Location
    {
    struct Coord Latitude;
    struct Coord Longitude;
    };
```

Helpful Hints (honestly!)

```
Location *Location1 = StringToCoords(loc1);
Location *Location2 = StringToCoords(loc2);
double    Distance  = CoordsToMiles(Location1, Location2);
```

WARNING: Partial line of code. USE THIS FORMAT!

```
printf("%18s: Lat: %3d %02d %02d  Long: %4d %02d %02d  Miles: %3.1f   %06lu records processed\n",
```

Required Output

```
KE6GYD-5: Lat:  33 42 15  Long: -117 46 24  Miles: 1.2   000042 records processed
```

1. Please DO NOT submit a screen grab of your output screen. Rather, use the Code::Blocks Export Text function to export the text into a text file. Make sure it is cleanly formatted with no line wraps. Submit it as a PDF file.
2. Use the source code formatter in Code::Blocks
   a. Plugins > Source Code Formatter (AStyle)
   b. Take time to clean-up your source for best readability.

Helpful Hints (honestly!)

Helpful Resources

PDF Article in Module