Part 3: NMEA Parser

Program to parse the http://www.catb.org/gpsd/NMEA.html#_gst_gps_pseudorange_noise_statistics
NMEA format string.

NMEA Parser Static Analysis Results Summary

#	Severity	Types & description of the problem
1	Medium	Error ID: "**Deference after null check**" *Problem Description: pointer p2 might be null as it is being compared to null, but then it is being assigned to buff. Passing null pointer buff to strchr() deference it.* Line 218: if((p2 = strchr(buf, ',')) == NULL) printf("Wrong format"); Line 233: buf = p2 + 1; Line 243: if((p2=strchr(buf,','))==NULL) { printf("Wrong format\n");
2	Medium	Error ID: "**Deference after null check**" *Problem Description: Deference before NULL check* Line 912: if(buf== NULL) return; Null checking buff suggests that it may be null which has already been deferenced in preceding paths like if((p2=strchr(buf,','))==NULL).
3	Medium	Error ID: "**Missing Break in switch**" *Problem Description: The case for value M is not terminated by break statement* Line 1899: case 'M':if((digitFound==0) && (HexDigit==0) && (DirectionFound==0) && (dotFound==0) && (starFound==0)) { ManualFound++;} else {printf("\nInvalid Input "); return i; }
4	Medium	Error ID: "**Logically dead code**" *Problem Description: At condition buff==NULL the value of buff cannot be NULL because buff is being used in previous instructions. It is a logically dead code, execution cannot reach this statement.*

Dynamic analysis of NMEA Parser:

#	Problem Descriptions	Inputs
1	If first few lines blank, afterwards valid input present, then parser shows no valid input present.	" $GPGLL,4916.45,N,12311.12,W,225444,V,*34 "
2	Incorrect parsing for the below input string	• $GPGLL,4916.45,N,.12,W,225444,V,*34 • $GPGLL,4916.45,N,1.12,W,225444,V,*34
3	**The parser crash for the following inputs.** **(i.e. anything with 24 decimal points above)**	$GPGLL,4916.45,N,1.12222222222222222222 2222,W,225444,V,*34
4	The parser fails to check the for the input	$GPGLL,.45,N,12311.12,W,225444,V,*34
5	The incorrect message shows for the input. Output: **Wrong value of latitude. Latitude measurements range from 0B0 to 90B0.** If input is: $GPGLL,90B0,N,12311.12,W,225444,V,*34 Output: $GPGLL,90B0,N,12311.12,W,225444,V,*34 Error Found at location :10	$GPGLL,111111114916.45,N,12311.12,W,225 444,V,*34