

CANDEV DATA CHALLENGE

TEAM 2472

Parse Raw Data and Decode! (PYTHON)

```
C:\Windows\System32\cmd.exe - python Parsing2_0.py
{'type': 1, 'repeat': 0, 'mmsi': 316011407, 'status': 'Under way using engine', 'turn': '30.2Â° Left', 'speed': '18.7 knots', 'accuracy': '1', 'lon': '123Â°21\'14.1"W', 'lat': '48Â°50\'39.8"N', 'course': '165.4Â°', 'heading': '164.0Â°', 'second': 49, 'maneuver': 0, 'raim': '0', 'radio': 67393}
{'type': 1, 'repeat': 0, 'mmsi': 373821000, 'status': 'Under way using engine', 'turn': 'N/A', 'speed': '13.8 knots', 'accuracy': '1', 'lon': '127Â°7\'57.9"W', 'lat': '48Â°34\'57.6"N', 'course': '95.1Â°', 'heading': '93.0Â°', 'second': 45, 'maneuver': 0, 'raim': '0', 'radio': 17636}
{'type': 1, 'repeat': 0, 'mmsi': 316001687, 'status': 'Under way using engine', 'turn': 'N/A', 'speed': '5.4 knots', 'accuracy': '1', 'lon': '79Â°14\'57.9"W', 'lat': '42Â°52\'30.6"N', 'course': '189.9Â°', 'heading': '191.0Â°', 'second': 49, 'maneuver': 0, 'raim': '0', 'radio': 34623}
{'type': 1, 'repeat': 0, 'mmsi': 316006970, 'status': 'Under way using engine', 'turn': 'N/A', 'speed': '6.8 knots', 'accuracy': '1', 'lon': '53Â°55\'0.72"W', 'lat': '46Â°11\'9.42"N', 'course': '187.2Â°', 'heading': '193.0Â°', 'second': 35, 'maneuver': 0, 'raim': '1', 'radio': 2203}
{'type': 1, 'repeat': 0, 'mmsi': 316015716, 'status': 'Under way using engine', 'turn': 'N/A', 'speed': '0 knots', 'accuracy': '1', 'lon': '63Â°35\'9.33"W', 'lat': '44Â°39\'37.6"N', 'course': '00.0Â°', 'heading': 'N/A', 'second': 49, 'maneuver': 0, 'raim': '1', 'radio': 67398}
{'type': 2, 'repeat': 0, 'mmsi': 212797000, 'status': 'Under way using engine', 'turn': 'N/A', 'speed': '9.9 knots', 'accuracy': '1', 'lon': '79Â°12\'36.1"W', 'lat': '43Â°15\'47.5"N', 'course': '46.0Â°', 'heading': '45.0Â°', 'second': 50, 'maneuver': 0, 'raim': '0', 'radio': 17636}
{'type': 1, 'repeat': 0, 'mmsi': 316003370, 'status': 'Moored', 'turn': 'N/A', 'speed': 'N/A', 'accuracy': '0', 'lon': '181Â°0\'0.0"E', 'lat': '91Â°0\'0.0"N', 'course': '360.0Â°', 'heading': 'N/A', 'second': 'PS inoperative', 'maneuver': 0, 'raim': '0', 'radio': 231277}
{'type': 1, 'repeat': 0, 'mmsi': 367382440, 'status': 'Under way using engine', 'turn': 'N/A', 'speed': '0 knots', 'accuracy': '1', 'lon': '123Â°9\'26.3"W', 'lat': '48Â°36\'37.8"N', 'course': '234.9Â°', 'heading': '137.0Â°', 'second': 50, 'maneuver': 0, 'raim': '0', 'radio': 67396}
{'type': 1, 'repeat': 0, 'mmsi': 316006988, 'status': 'Not defined (default)', 'turn': 'N/A', 'speed': '0 knots', 'accuracy': '0', 'lon': '123Â°5\'21.3"W', 'lat': '49Â°12\'0.57"N', 'course': '277.2Â°', 'heading': 'N/A', 'second': 49, 'maneuver': 0, 'raim': '0', 'radio': 82119}
{'type': 1, 'repeat': 0, 'mmsi': 366929710, 'status': 'Under way using engine', 'turn': 'N/A', 'speed': '0 knots', 'accuracy': '0', 'lon': '123Â°25\'48.8"W', 'lat': '48Â°7\'20.9"N', 'course': '258.9Â°', 'heading': 'N/A', 'second': 50, 'maneuver': 0, 'raim': '0', 'radio': 100166}
{'type': 1, 'repeat': 0, 'mmsi': 316010139, 'status': 'Not defined (default)', 'turn': 'N/A', 'speed': '8.0 knots', 'accuracy': '1', 'lon': '54Â°36\'44.0"W', 'lat': '47Â°22\'48.1"N', 'course': '214.2Â°', 'heading': 'N/A', 'second': 49, 'maneuver': 0, 'raim': '1', 'radio': 49154}
{'type': 1, 'repeat': 0, 'mmsi': 255804570, 'status': 'Under way using engine', 'turn': 'N/A', 'speed': '13.0 knots', 'accuracy': '1', 'lon': '60Â°31\'21.0"W', 'lat': '44Â°46\'32.6"N', 'course': '218.5Â°', 'heading': '218.0Â°', 'second': 49, 'maneuver': 0, 'raim': '0', 'radio': 133352}
{'type': 1, 'repeat': 0, 'mmsi': 366972030, 'status': 'Under way using engine', 'turn': 'N/A', 'speed': '1.3 knots', 'accuracy': '0', 'lon': '84Â°20\'53.3"W', 'lat': '46Â°30\'11.2"N', 'course': '266.7Â°', 'heading': '267.0Â°', 'second': 47, 'maneuver': 0, 'raim': '0', 'radio': 231235}
{'type': 1, 'repeat': 0, 'mmsi': 316001834, 'status': 'Under way using engine', 'turn': 'N/A', 'speed': '7.8 knots', 'accuracy': '1', 'lon': '83Â°22\'47.9"W', 'lat': '45Â°20\'41.9"N', 'course': '262.4Â°', 'heading': '261.0Â°', 'second': 50, 'maneuver': 0, 'raim': '0', 'radio': 49172}
{'type': 3, 'repeat': 0, 'mmsi': 316008101, 'status': 'Under way using engine', 'turn': '> 5Â°/30sec Left (No TI available)', 'speed': '0.9 knots', 'accuracy': '0', 'lon': '61Â°22\'53.5"W', 'lat': '45Â°35\'14.5"N', 'course': '63.1Â°', 'heading': '155.0Â°', 'second': 49, 'maneuver': 0, 'raim': '0', 'radio': 3904}
{'type': 1, 'repeat': 0, 'mmsi': 235068085, 'status': 'Under way using engine', 'turn': 'N/A', 'speed': '11.7 knots', 'accuracy': '0', 'lon': '124Â°32\'43.8"W', 'lat': '48Â°25\'8.10"N', 'course': '114.0Â°', 'heading': '113.0Â°', 'second': 49, 'maneuver': 0, 'raim': '0', 'radio': 17636}
{'type': 1, 'repeat': 0, 'mmsi': 316004661, 'status': 'Under way using engine', 'turn': 'N/A', 'speed': '6.4 knots', 'accuracy': '1', 'lon': '124Â°9\'51.9"W', 'lat': '49Â°34\'50.3"N', 'course': '140.6Â°', 'heading': '139.0Â°', 'second': 50, 'maneuver': 0, 'raim': '0', 'radio': 2238}
```

Differentiating between Valid or Not Valid Static AIS Info Using Machine Learning (JAVA)

```
import java.io.BufferedReader;
import java.io.FileReader;
import java.util.List;
import java.util.ArrayList;
import java.io.FileNotFoundException;
import java.io.IOException;
import java.util.Arrays;

public class Validity2{

    public void valid (String name) throws IOException{

        BufferedReader read = new BufferedReader(new FileReader(name));
        String line = read.readLine();
        int i = 0;
        while( (line = read.readLine()) != null){
            System.out.println("i: " + i);
            i++;
            String[] values = line.split(",");
            if((values[14]).equals("NA") || Integer.parseInt((values[14])) == 0){
                System.out.println(" " + values[16] + " is not a valid ship: " + values[14] + " ");
            }else if ( Integer.parseInt((values[14])) != 0){
                System.out.println(" " + values[16] + " is a valid ship: " + values[14] + " ");
            }
        }
    }
}
```

```
NA is not a valid ship: NA
i: 296508
NA is not a valid ship: NA
i: 296509
HAILEY MEGAN is not a valid ship: NA
i: 296510
NA is not a valid ship: NA
i: 296511
KD&4J&??S is not a valid ship: NA
i: 296512
NA is not a valid ship: NA
i: 296513
COLETTE MARIE is not a valid ship: NA
i: 296514
NA is not a valid ship: NA
i: 296515
PUBLICO STAR is not a valid ship: NA
i: 296516
T&3J&??S is not a valid ship: NA
i: 296517
NA is not a valid ship: NA
i: 296518
GRAMVILLE is not a valid ship: NA
i: 296519
FORTUNE PRIDE is not a valid ship: NA
i: 296520
MAKE OR BREAK 2016 is not a valid ship: NA
i: 296521
NA is not a valid ship: NA
i: 296522
MARIE EVE II is not a valid ship: NA
i: 296523
MARIE CHARLOTTE 2 is not a valid ship: NA
i: 296524
JORDAN MIST is not a valid ship: NA
i: 296525
NA is not a valid ship: NA
i: 296526
NA is not a valid ship: NA
i: 296527
IVY ROSE is not a valid ship: NA
i: 296528
STELLA LEORA is not a valid ship: NA
i: 296529
```

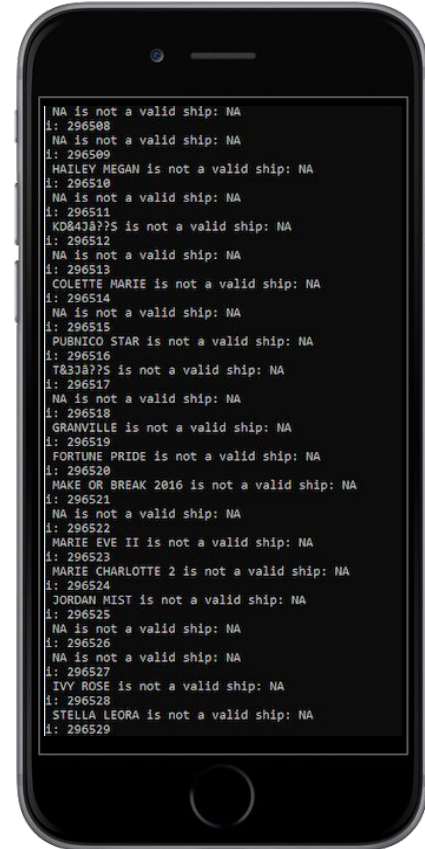
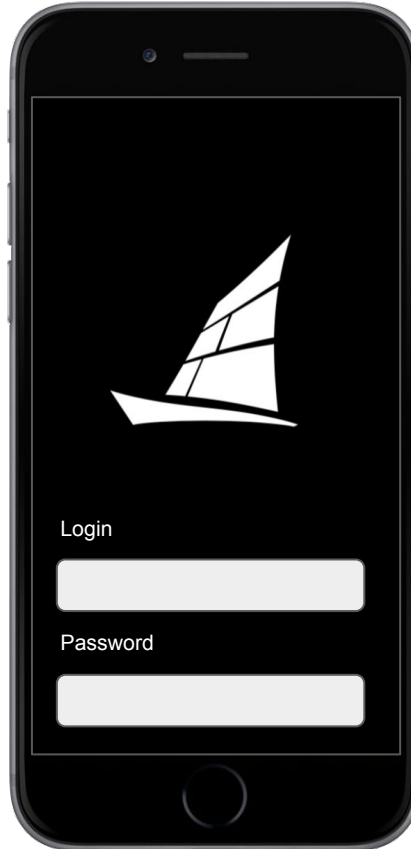
Minimum Information Update through Machine Learning

Application Development Admin vs. User Design



MyFisheriesMyOceans

Admin vs. User Login



Hourly density of vessels
travelling 5 knots, 5-10
knots, 10-15 knots, and greater
than 15 knots?

Is there any variation between the days
available?

What would be the impact of limiting the speed to 10 knots?