

# Project 3 – Solution

## Task 1: Array analyzer

Write a function that takes array number and returns an object with the count of positive numbers, negative numbers, and the average of all numbers.

## Solution



## Inside function node:

```
function analytics(input)
{
    var positiveCount = 0;
    var negativeCount = 0;
    var average = 0;
    for (var index in input) {
        if (input[index] > 0)
        {
            positiveCount += 1;
        }
        else if (input[index] < 0)
        {
            negativeCount += 1;
        }
    }
}
```

```

    average = average + input[index]
  }
  average = average/input.length
  return {
    "positiveCount": positiveCount,
    "negativeCount": negativeCount,
    "average": Number(average.toFixed(2))
  };
}

```

```

msg.payload = analytics(msg.payload);
return msg;

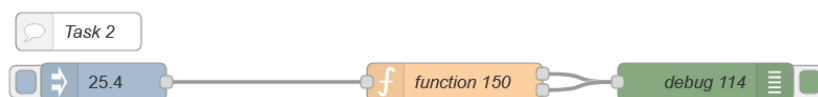
```

## Task 2: Sensor data converter

Write two functions that converts sensor data from one unit to another:

- Temperature from Celsius to Fahrenheit
- Distance from millimeters to inches

## Solution



```

2/7/2024, 10:07:57 PM node: debug 114
Fahrenheit : msg.payload : number
77.72

2/7/2024, 10:07:57 PM node: debug 114
Inches : msg.payload : number
1

```

## Inside function node:

```
function celciusToFahrenheit(celcius)
```

```
{  
    return (celcius * 9/5) + 32;  
}
```

```
function mmToInches(mm)
```

```
{  
    return (mm * 1/25.4);  
}
```

```
var msg1 = {topic: "Fahrenheit", payload : celciusToFahrenheit(msg.payload)};
```

```
var msg2 = {topic: "Inches", payload : mmToInches(msg.payload)};
```

```
return [msg1,msg2];
```

### Task 3: OEE Calculator

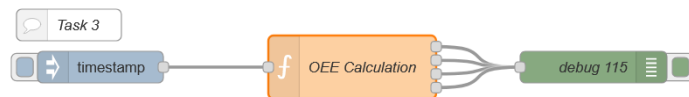
Write several functions that calculates the OEE of a machine.

Reference: <https://www.oeo.com/calculating-oeo/>

- **Availability** = Run Time / Planned Production Time
- **Run Time** = Planned Production Time – Stop Time
- **Performance** = (Ideal Cycle Time × Total Count) / Run Time
- **Quality** = Good Count / Total Count
- **OEE** = Availability × Performance × Quality

### Solution

The solution has been created with static values of runtime, planned production time, stop time etc. I would like you to take these values from the dashboard and simulate OEE based on dynamic good and bad counts input. Be creative and feel free to share the solution via [LinkedIn](#). Don't forget to tag [me](#). Good luck!



all nodes		all
2/7/2024, 10:06:44 PM	node: debug 115	
Availability : msg.payload : number		
		62.5
2/7/2024, 10:06:44 PM	node: debug 115	
Performance : msg.payload : number		
		60
2/7/2024, 10:06:44 PM	node: debug 115	
Quality : msg.payload : number		
		83.33333333333333
2/7/2024, 10:06:44 PM	node: debug 115	
OEE : msg.payload : number		
		31.25

## Inside function node:

/\*Simulated data

Runtime: 5 hours

Planned Production time: 8 hours

Stop time: 3 hours

Ideal cycle time: 0.1 hour

Total Count: 30

Good Count: 25

\*/

function availability(runtime, plannedProductionTime)

{

return runtime / plannedProductionTime \* 100;

}

function performance(idealCycleTime, totalCount, runtime)

```
{  
    return (idealCycleTime * totalCount *100 / runTime);  
}
```

```
function quality(goodCount, totalCount)  
{  
    return (goodCount * 100 /totalCount);  
}
```

```
var msg1 = {topic: "Availability", payload : availability(5,8)};  
var msg2 = {topic: "Performance", payload : performance(0.1,30,5)};  
var msg3 = {topic: "Quality", payload : quality(25,30)};  
var msg4 = {topic: "OEE", payload : (msg1.payload * msg2.payload *  
msg3.payload)/10000};  
  
return [msg1,msg2,msg3,msg4];
```