Report for 5.3

**Introduction:**

The manual annotation is human work to define the positive value and negative value of each sentience from the corpus. We need to analyze those crawling data and to determine the polarity value of them.

**Goal:**

By using the Cohen’s kappa coefficient, we can measures the inter-rate agreement from the sample. It calculates the score of the homogeneity or consensus of among given agreement and optimize the raters by human judges.

**Cohen’s kappa:**

The Kappa value and Accuracy value forms the same simulated binary data. The value of the Accuracy is generated in direct proportion to the value of Kappa. The Accuracy value of the agreement is characterized:

* 0 – 0.2 as “slight”;
* 0.21 – 0.4 as “fair”;
* 0.41 – 0.6 as “moderate”;
* 0.61 – 0.8 as “substantial”;
* 0.81 – 1 as “almost perfect”;

We define when the Kappa value is equal to “0”, and the corresponding value of the accuracy is equal to “0.5”.

Q1:

We set the first 100 texts as a subset “S1”, median 100 texts as a subset “S2”, last 100 texts as a subset “S3”.

Q2:

The result of A1:

|  |  |  |
| --- | --- | --- |
|  | Yes | No |
| A | 36 | 64 |

Q3:

The result of A2:

|  |  |  |
| --- | --- | --- |
|  | Yes | No |
| A | 43 | 57 |
| B | 35 | 65 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | | A2G2 | |
| Yes | No |
| A2G1 | Yes | 5 | 30 |
| NO | 38 | 27 |

Q 4 & 5:

The kappa value of the IAA:

K = (Po - Pe) / (1 - Pe);

The observed proportionate agreement Po = (5+27) / 100 = 0.32;

A declares “Yes” is 0.43 of the time:

B declares “Yes” is 0.35 of the time;

The overall probability of random agreement

Pe = 0.43 \* 0.35 + (1 – 0.43) \* (1 – 0.35) = 0.521;

I1 = (0.32 – 0.521) / (1 – 0.521) = (-) 0.42;

Q6:

The result of A3:

|  |  |  |
| --- | --- | --- |
|  | Yes | No |
| A | 37 | 63 |
| B | 40 | 60 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | | A3G2 | |
| Yes | No |
| A3G1 | Yes | 17 | 23 |
| NO | 20 | 40 |

The observed proportionate agreement Po = (17+40) / 100 = 0.57;

A declares “Yes” is 0.37 of the time:

B declares “Yes” is 0.4 of the time;

The overall probability of random agreement

Pe = 0.37 \* 0.4 + (1 – 0.37) \* (1 – 0.4) = 0.526;

I2 = (0.57 – 0.526) / (1 – 0.526) = 0.093;

Q7:

For S2, the kappa value of IAA is I1 = (-) 0.42, the according accuracy value is around 0.2.

For S3, the kappa value of IAA is I2 = 0.093, the according accuracy value is around 0.5.

Since I1 is smaller than I2, the agreement decision in S3 is more coherent than the S2’s. In the other words, people will have higher rate of the same opinion (either both are positive or negative) in S3 compared with S2.