1)

1.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Abs. | Good | Medium | Strong delay |  |
| Without alcohol | 120 | 60 | 20 | 200 (1) |
| With alcohol | 60 | 100 | 40 | 200 (2) |
|  | 180 (3) | 160 (4) | 60 (5) | 400 (6) |

1. 200 subjects where in the group that recieved no alcohol.
2. 200 subjects where in the group that recieved a standardized amount of alcohol.
3. 180 subjects had a good reaction time.
4. 160 subjects had a medium reaction time.
5. 60 subjects had a strong reaction delay.
6. 400 subjects were tested.

2.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| f(a­­­­i|bj) | Good | Medium | Strong delay |  |
| Without alcohol | 2/3 (1) | 3/8 | 1/3 |  |
| With alcohol | 1/3 | 5/8 | 2/3 |  |
|  | 1 | 1 | 1 |  |

1. 2/3 of subjects who had a good reaction time didn’t recieve alcohol.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| f(bj|ai) | Good | Medium | Strong delay |  |
| Without alcohol | 3/5 (1) | 3/10 | 1/10 | 1 |
| With alcohol | 3/10 | 1/2 | 2/20 | 1 |
|  |  |  |  |  |

1. 3/5 of subjects who didn’t recieve alcohol had a good reaction time.

3.

H0: Reaction time doesn’t correlate with alcohol intake

H1: Reaction time correlates with alcohol intake

x2 =

→ i.e. we reject H0 at significance level α = 0.005.

2)

Temperature (F): Intervall-scale

Socio-Economic Status: Ordinal

Temperature (K): Ratio-scale

Distance: Intervall-scale

Grades in School: Ordinal

Description: Nominal

Date: Intervall-scale

2.

Intervall-scale: temperature (Celsius), time (e.g. 00:00)

Ratio-scale: number of sales, weight

3)

1. **Original L1 and L∞ Distances:**

* ∑∣*Ai*​−*Bi*​∣ for each time point *i*.

*L1=∣−1.66−0.29∣+∣0.30−0.89∣+∣−0.08−0.82∣+∣0.10−0.97∣+∣−1.17−0.53∣+∣−0.05−0.83∣+∣0.84−1.06∣+∣−0.66−0.67∣+∣0.42−0.86∣+∣−0.99−0.51∣*

* ∣−1.66−0.29∣=∣−1.95∣=1.95∣−1.66−0.29∣=∣−1.95∣=1.95
* ∣0.30−0.89∣=∣−0.59∣=0.59∣0.30−0.89∣=∣−0.59∣=0.59
* ∣−0.08−0.82∣=∣−0.90∣=0.90∣−0.08−0.82∣=∣−0.90∣=0.90
* ∣0.10−0.97∣=∣−0.87∣=0.87∣0.10−0.97∣=∣−0.87∣=0.87
* ∣−1.17−0.53∣=∣−1.70∣=1.70∣−1.17−0.53∣=∣−1.70∣=1.70
* ∣−0.05−0.83∣=∣−0.88∣=0.88∣−0.05−0.83∣=∣−0.88∣=0.88
* ∣0.84−1.06∣=∣−0.22∣=0.22∣0.84−1.06∣=∣−0.22∣=0.22
* ∣−0.66−0.67∣=∣−1.33∣=1.33∣−0.66−0.67∣=∣−1.33∣=1.33
* ∣0.42−0.86∣=∣−0.44∣=0.44∣0.42−0.86∣=∣−0.44∣=0.44
* ∣−0.99−0.51∣=∣−1.50∣=1.50∣−0.99−0.51∣=∣−1.50∣=1.50

***L*1**=1.95+0.59+0.90+0.87+1.70+0.88+0.22+1.33+0.44+1.50=10.38

* ***L*∞**=max(1.95,0.59,0.90,0.87,1.70,0.88,0.22,1.33,0.44,1.50)=1.95

1. **Offset Translation (Mean Subtraction):**

* ∣A1′−B1′∣=0.912
* ∣A2′−B2′∣=0.448
* ∣A3′−B3′∣=0.138
* ∣A4′−B4′∣=0.168
* ∣A5′−B5′∣=0.662
* ∣A6′−B6′∣=0.158
* ∣A7′−B7′∣=0.818
* ∣A8′−B8′∣=0.292
* ∣A9′−B9′∣=0.598
* ∣A10′−B10′∣=0.462

***L*1offset​** =0.912+0.448+0.138+0.168+0.662+0.158+0.818+0.292+0.598+0.462=4.656

***L*∞offset**​ =max(0.912,0.448,0.138,0.168,0.662,0.158,0.818,0.292,0.598,0.462)=0.912

1. **Amplitude Scaling (Standard Deviation Normalization):**

* ∣*A*1′′​−*B*1′′​∣=0.1897
* ∣*A*2′′​−*B*2′′​∣=0.1405
* ∣*A*3′′​−*B*3′′​∣=0.0549
* ∣*A*4′′​−*B*4′′​∣=0.4792
* ∣*A*5′′​−*B*5′′​∣=0.2207
* ∣*A*6′′​−*B*6′′​∣=0.0592
* ∣*A*7′′​−*B*7′′​∣=0.1062
* ∣*A*8′′​−*B*8′′​∣=0.1622
* ∣*A*9′′​−*B*9′′​∣=0.4327
* ∣*A*10′′​−*B*10′′​∣=0.1070

***L*1scaled** = 0.1897+0.1405+0.0549+0.4792+0.2207+0.0592+0.1062+0.1622+0.4327+0.1070

=1.9524

***L*∞scaled** =max(0.1897,0.1405,0.0549,0.4792,0.2207,0.0592,0.1062,0.1622,0.4327,0.1070)

=0.4792