**Lembar Jawaban Kalkulasi Neural Network**

**Pada lembar jawaban ini, kamu dapat menuliskan cara mengkalkulasikan nilai-nilai yang diminta pada arsitektur neural network sesuai soal, ya, semangat!😄**

Pertama, masukkan dulu nilai initial value dan randomnya ya …

**Initial Value**

| **x1** | **x2** | **x3** | **α** | **Threshold** | **Yd,6** |
| --- | --- | --- | --- | --- | --- |
| 0.7 | 0.8 | 0.9 | 0.1 | -1 | 0 |

**Initial Random**

| **W14** | **W15** | **W24** | **W25** | **W34** | **W35** | **W46** | **W56** | **θ4** | **θ5** | **θ6** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0.5 | 0.6 | 0.3 | 1.1 | -1.0 | 0.1 | -1.1 | -0.7 | 0.2 | 0.3 | 0.4 |

Jika sudah selesai, kita akan masuk ke langkah-langkah kalkulasi, sebagai berikut:

**Forward Pass**

Forward Pass merupakan hasil dari langkah 1 pada proses kalkulasi di challenge deck. Oleh karena itu kamu tuliskan langkah kalkulasi yang kamu lakukan untuk mencari nilai-nilai di bawah ini, ya🙌

**Langkah 1: Menghitung output Neuron 4 (y4), Neuron 5 (y5), Neuron 6 (y6), dan Error menggunakan sigmoid function**

| Y4 | = |
| --- | --- |
|  | = |
|  | = 0.3752 |
| Y5 | = |
|  | = |
|  | = 0.7484 |
| Y6 | = |
|  | = |
|  | = 0.2081 |
| e | = |
|  | = |
|  | = -0.2081 |

Lalu isi rangkuman hasilnya di tabel ini ya …

| **Y4** | **Y5** | **Y6** | **e** |
| --- | --- | --- | --- |
| 0.3752 | 0.7484 | 0.2081 | -0.2081 |

**Backward Pass**

Sementara itu, nilai-nilai dari backward pass didapatkan dengan menjalankan langkah 2, 3, dan 4. Jangan lupa tuliskan proses dan hasil kalkulasinya pada tempat yang telah disediakan di bawah, ya👍

**Langkah 2: Hitung error gradient untuk Neuron 6 di Output Layer dan weight corrections**

| δ6 | = |
| --- | --- |
|  | = |
|  | = 0.2081 ( 0.7919 ) (-0.2081) = -0.0342 |
| ∇w46 | = |
|  | = 0.1 x 0.3752 x (-0.0342) |
|  | = -0.0013 |
| ∇w56 | = |
|  | = |
|  | = -0.0026 |
| ∇θ6 | = |
|  | = 0.1 x (- 1 ) x (-0.0342) |
|  | = 0.0034 |

Lalu isi rangkuman hasilnya di tabel ini ya …

| **δ6** | **∇46** | **∇56** | **∇θ6** |
| --- | --- | --- | --- |
| -0.0342 | -0.0013 | -0.0026 | 0.0034 |

**Langkah 3: Hitung error gradients untuk Neuron 4 dan Neuron 5 di Middle Layer/Hidden Layer**

| δ4 | = |
| --- | --- |
|  | = 0.3752(1- 0.3752 ) x (-0.0342) x (-1.1) |
|  | = 0.0088 |
| δ5 | = |
|  | = 0.7484 ( 1 - 0.7484 ) x ( -0.0342 ) x (-0.7) |
|  | = 0.0045 |

Lalu isi rangkuman hasilnya di tabel ini ya …

| **δ4** | **δ5** |
| --- | --- |
| 0.0088 | 0.0045 |

**Langkah 4: Hitung weight corrections**

| ∇w14 | = |
| --- | --- |
|  | = 0.1 x 0.7 x 0.0088 |
|  | = 0.0006 |
| ∇w24 | = |
|  | = 0.1 x 0.8 x 0.0088 |
|  | = 0.0007 |
| ∇w34 | = |
|  | = 0.1 x 0.9 x 0.0088 |
|  | = 0.0008 |
| ∇θ4 | = |
|  | = 0.1 x ( - 1 ) x 0.0088 |
|  | = -0.0009 |
| ∇w15 | = |
|  | = 0.1 x 0.7 x 0.0045 |
|  | = 0.0003 |
| ∇w25 | = |
|  | = 0.1 x 0.8 x0.0045 |
|  | = 0.0004 |
| ∇w35 | = |
|  | = 0.1 x 0.9 x 0.0045 |
|  | = 0.0004 |
| ∇θ5 | = |
|  | = 0.1 x ( - 1 ) x 0.0045 |
|  | = -0.0005 |

Lalu isi rangkuman hasilnya di tabel ini ya …

| **∇w14** | **∇w24** | **∇w34** | **∇θ4** | **∇w15** | **∇w25** | **∇w35** | **∇θ5** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0.0006 | 0.0007 | 0.0008 | -0.0009 | 0.0003 | 0.0004 | 0.0004 | -0.0005 |

**Backward Pass**

Last but not least, adalah nilai-nilai dari updated weight didapatkan dengan menjalankan langkah nomor 5. Seperti biasa, tuliskan proses dan hasil kalkulasinya pada tempat yang telah disediakan di bawah, ya👌

**Langkah 5: Hitung semua weights dan theta pada arsitektur yang telah diperbarui**

| w14 | = |
| --- | --- |
|  | = 0.5 + 0.0006 |
|  | = 0.5006 |
| w15 | = |
|  | = 0.6 + 0.003 |
|  | = 0.6003 |
| w24 | = |
|  | = 0.3 + 0.0007 |
|  | = 0.3007 |
| w25 | = |
|  | = 1.1 + 0.0004 |
|  | = 1.1004 |
| w34 | = |
|  | = -1.0 + 0.0008 |
|  | = -0.9992 |
| w35 | = |
|  | = 0.1 + 0.0004 |
|  | = 0.1004 |
| θ4 | = |
|  | = 0.2 + -0.0009 |
|  | = 0.1991 |
| θ5 | = |
|  | = 0.3 + -0.0005 |
|  | = 0.2995 |
| θ6 | = |
|  | = 0.4 + 0.0034 |
|  | = 0.4034 |

Lalu isi rangkuman hasilnya di tabel ini ya …

| **w14** | **w15** | **w24** | **w25** | **w34** | **w35** | **θ4** | **θ5** | **θ6** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0.5006 | 0.6003 | 0.3007 | 1.1004 | -0.9992 | 0.1004 | 0.1991 | 0.2995 | 0.4034 |

**Hore, kamu sudah menyelesaikan satu dari tiga proyek challenge, semoga mendapatkan hasil yang maksimal dan selamat bersenang-senang~**