**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 | = |
|  | = = |
|  | = 0.375193526 |
| Y5 | = |
|  | = = |
|  | = 0.74838172 |
| Y6 | = |
|  | = = |
|  | = 0.20807303 |
| e | = |
|  | = 0 – 0.20807303 |
|  | = - 0.20807303 |

Lalu isi rangkuman hasilnya di tabel ini ya …

|  |  |  |  |
| --- | --- | --- | --- |
| **Y4** | **Y5** | **Y6** | **e** |
| 0.375193526 | 0.74838172 | 0.20807303 | - 0.20807303 |

**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 | = |
|  | = 0.20807303 \* (1-0.20807303) \* (-0.20807303) |
|  | = -0.03428599 |
| ∇w46 | = |
|  | = 0.1 \* 0.375193526 \* (-0.03428599) |
|  | = -0.00128639 |
| ∇w56 | = |
|  | = 0.1 \* 0.748381722 \* (-0.03428599) |
|  | = -0.0025659 |
| ∇θ6 | = |
|  | = 0.1 \* (-1) \* (-0.03428599) |
|  | = 0.0034286 |

Lalu isi rangkuman hasilnya di tabel ini ya …

|  |  |  |  |
| --- | --- | --- | --- |
| **δ6** | **∇w46** | **∇w56** | **∇θ6** |
| -0.03428599 | -0.00128639 | -0.0025659 | 0.0034286 |

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

|  |  |
| --- | --- |
| δ4 | = |
|  | = 0.375193526 \* (1 - 0.375193526) \* (-0.03428599) \* (-1.1) |
|  | = 0.00884118 |
| δ5 | = |
|  | = 0.748381722 \* (1 - 0.748381722) \* (-0.03428599) \* (-0.7) |
|  | = 0.004519393 |

Lalu isi rangkuman hasilnya di tabel ini ya …

|  |  |
| --- | --- |
| **δ4** | **δ5** |
| 0.00884118 | 0.004519393 |

**Langkah 4: Hitung weight corrections**

|  |  |
| --- | --- |
| ∇w14 | = |
|  | = 0.1 \* 0.7 \* 0.00884118 |
|  | = 0.000618883 |
| ∇w24 | = |
|  | = 0.1 \* 0.8 \* 0.00884118 |
|  | = 0.000707294 |
| ∇w34 | = |
|  | = 0.1 \* 0.9 \* 0.00884118 |
|  | = 0.000795706 |
| ∇θ4 | = |
|  | = 0.1 \* (-1) \* 0.00884118 |
|  | = -0.00088412 |
| ∇w15 | = |
|  | = 0.1 \* 0.7 \* 0.004519393 |
|  | = 0.00031636 |
| ∇w25 | = |
|  | = 0.1 \* 0.8 \* 0.004519393 |
|  | = 0.00036155 |
| ∇w35 | = |
|  | = 0.1 \* 0.9 \* 0.004519393 |
|  | = 0.00040675 |
| ∇θ5 | = |
|  | = 0.1 \* (-1) \* 0.004519393 |
|  | = -0.00045194 |

Lalu isi rangkuman hasilnya di tabel ini ya …

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **∇w14** | **∇w24** | **∇w34** | **∇θ4** | **∇w15** | **∇w25** | **∇w35** | **∇θ5** |
| 0.000619 | 0.000707 | 0.000796 | -0.000884 | 0.000316 | 0.000362 | 0.000407 | -0.000452 |

**Updated Weight**

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 + 0.000618883 |
|  | = 0.500618883 |
| w15 | = |
|  | = 0.6 + 0.00031636 |
|  | = 0.60031636 |
| w24 | = |
|  | = 0.3 + 0.000707294 |
|  | = 0.300707294 |
| w25 | = |
|  | = 1.1 + 0.00036155 |
|  | = 1.10036155 |
| w34 | = |
|  | = -1 + 0.000795706 |
|  | = -0.9992043 |
| w35 | = |
|  | = 0.1 + 0.00040675 |
|  | = 0.10040675 |
| θ4 | = |
|  | = 0.2 + (-0.00088412) |
|  | = 0.19911588 |
| θ5 | = |
|  | = 0.3 + (-0.00045194) |
|  | = 0.299548061 |
| θ6 | = |
|  | = 0.4 + 0.0034286 |
|  | = 0.4034286 |

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** | **0.403** |

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