**Home Work Assignment 1**

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Noa

Task 1: Deep Learning Introduction

Dry section

1. Working with a convolution network:
   1. the output dimensions of the following layers is with an Input RGB image of size 128X128X3:

|  |  |  |
| --- | --- | --- |
| Layer # | Layer description | output dimensions |
| 1 | convolution with 64 kernels of size 1X1X3 | 128X128X64 |
| 2 | max pooling of size 2x2 | 64X64X64 |
| 3 | convolution with 32 kernels of size 5X5X64 (no zero padding). | 60X60X64 |

* 1. We will explain the calculation of a 2D convolution with a kernel of size 1X1X3.

The output of the convolution is the sum of the same pixel in all 3 channels of the image. i.e. let’s assume we have the following kernel:



|  |  |  |
| --- | --- | --- |
| **1** | **1** | **1** |

And the following image channels:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | **3** |  | **1** | **2** | **3** |  | **1** | **2** | **3** |
| **4** | **5** | **6** |  | **4** | **5** | **6** |  | **4** | **5** | **6** |
| **7** | **8** | **9** |  | **7** | **8** | **9** |  | **7** | **8** | **9** |

Then the output, as described above, will be:

|  |  |  |
| --- | --- | --- |
| **3** | **6** | **9** |
| **12** | **15** | **18** |
| **21** | **24** | **27** |

* 1. We will present the output of the convolution of the given sub-image with the following average filter:
     1. With stride = 1 and padding = 2
     2. With stride = 3 and padding = 2

1. 