Deep Learning

**Practical:09**

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**J001**

**BTECH Data Science**

**THIRD YEAR**

**J1 Batch**

**Aim:**

Identify and download 10 types of images from ImageNet and build a CNN model to classify them. The CNN model includes filters as 32, kernel size as (3,3) and activation function used in reLu.

The optimizer used in this model is ad delta and the loss function is binary\_crossentropy. Accuracy: 76.3%.

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| --- | --- | --- | --- |
| Flatten 1 (Flatten) | (None, | 256) |  |
| Dense 1 (Dense) | (done, | 128) | 32896 |
| Dropout 1 (Dropout) | (done, | 12B) |  |
| dense\_2 (Dense) | (done, | b4) | 8256 |
| dropout\_2 (Dropout) | (None | 64) |  |
| dense\_3 (Dense) | (None, | 32) | 2888 |



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| conv2d\_l\_input: IdputL | iiiput | (None. 32, 32, 3j  {Nooe, 32, 32, 3) |
| outpuc |

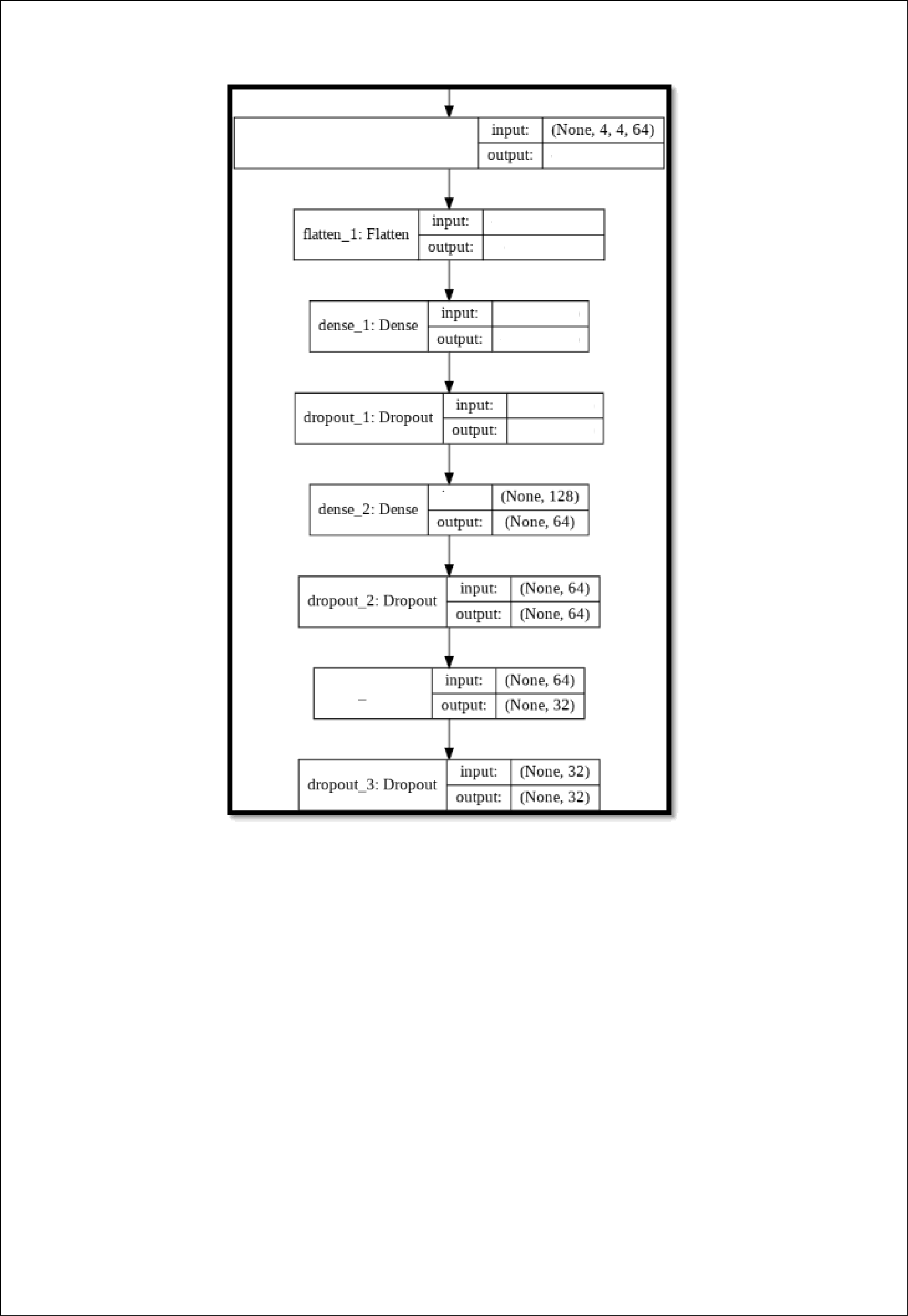
|  |  |  |
| --- | --- | --- |
| mw2d\_1: Corr•2D | input: | tNone. 32. 32.3} |
|  |  |

|  |  |  |
| --- | --- | --- |
| 2: Conv2o  " | iaput: | (None 16 16 32) |
| outpur: | (None, 16, 16, 64} |

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| xov2d\_3:0oov2D | Input | {Nooe, 8, 8, 64) |
| output: | (Nooe, 8, 8, b4) |

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| It\ag oo1ine2d\_3: MagPoofiog2D | input: | (f4one, 8, 8, 6d) |
| oug›ut: | (t'Jone, 4, 4, b4) |

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| --- | --- | --- |
| conv2d 4. C. 2D | input | (None, 4, 4, b4) |
| oytput: | (Nooe, 4, 4, 64) |



max ooling2d\_4 : MaxPooling2D

dense 3: Den se

(None, 2, 2, 6 )

(None,2,Z,6Q

(No\*z,256)

(None 256)

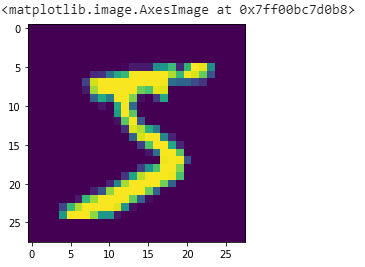
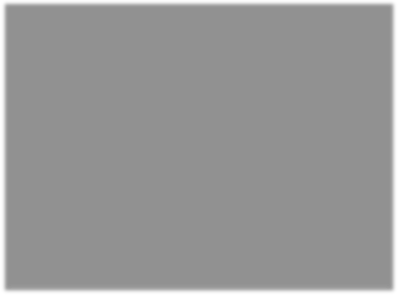
(None, 128)

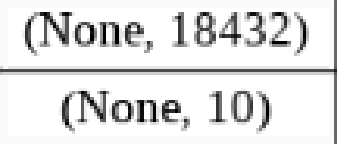
(None, 128)

(None, 128)

Cat/Dog Classifier gets an accuracy of 49.53% after using optimizer as adam and the loss function as binary\_crossentropy.

For MNIST, Out of the 70,000 images provided in the dataset, 60,000 are given for training and 10,000 are given for testing.





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| conv2d\_7\_inpui: InpulLayer | mput | (Alone, 28, 28, 1) |
| ouQuc: | [None 2B, 2B, 1) |

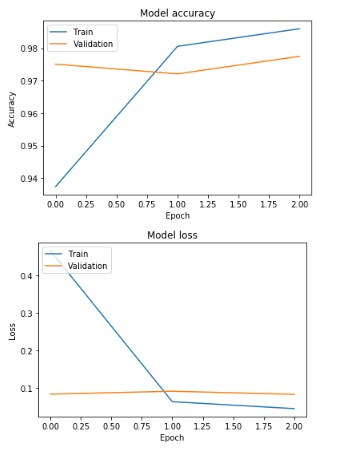
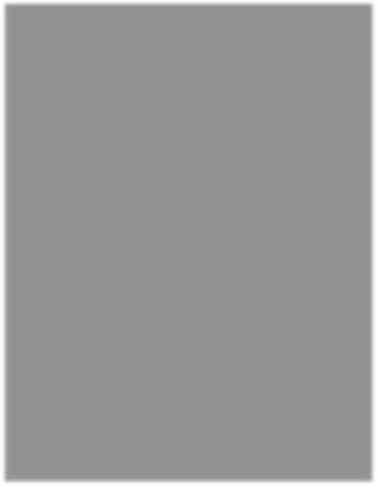
|  |  |  |
| --- | --- | --- |
| COTlV2d 7: Gonv2D | input: | (None, 2B, 2B, 1) |
| output | (Nnne, 26, 26, 64) |

|  |  |  |
| --- | --- | --- |
| coov2d\_8: Conv2D | mpuu | (None 26, 26, 64) |
| oul@ub | (NoOe, 24, 24, 32) |

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| --- | --- | --- |
| Qatten\_3: Flahm |  |  |
| oupul: | {None, 18432) |

|  |  |  |
| --- | --- | --- |
| dense 7: Dense | input: | (None, 18432)  (None, 10) |
| output: |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| model : "sequent1aI\_3 " |  | | | |
| Layer (type) | Output | Sh ape |  |  |
| c onv zd\_7 ( Conv2D) | (None, | 26, 26, | 6-4) |  |
| c onv zd\_B ( Conv2D) | (None, | 24-, 24, | 32) | 18464 |
| -F1atten\_3 ( FI a tten ) | (Non e, | 18432) |  |  |
| dense\_y (Dense ) | (None, | Ie) |  | 184330 |
| Total pa raw s : 283, 434  *Tra1*nable p a rams: ze3, 434- |  |  |  |  |
| Non -I r a1 nab 1e par ams : e |  |  |  |  |



Accuracy: 98%

**Code:**

[https://colab.research.google.com/drive/1n01EAT3yFmPGMEoE69DUq1PesLT0O0Bl#forceEdit=true](https://colab.research.google.com/drive/1n01EAT3yFmPGMEoE69DUq1PesLT0O0Bl#forceEdit%3Dtrue%26sandboxMode%3Dtrue) [&sandboxMode=true](https://colab.research.google.com/drive/1n01EAT3yFmPGMEoE69DUq1PesLT0O0Bl#forceEdit%3Dtrue%26sandboxMode%3Dtrue)