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| --- | --- |
|  | Sprint 4 |
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|  | "#import keras libraries\n", |
|  | "from keras.models import Sequential\n", |
|  | "from keras.layers import Dense\n", |
|  | "from keras.layers import Convolution2D\n", |
|  | "from keras.layers import MaxPooling2D\n", |
|  | "from keras.layers import Flatten" |
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|  | "#image preprocessing(or) image augmentation\n", |
|  | "from keras.preprocessing.image import ImageDataGenerator" |
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|  | "train\_datagen = ImageDataGenerator(rescale=1./255,shear\_range=0.2,zoom\_range=0.2,horizontal\_flip=True,vertical\_flip=True)\n", |
|  | "#rescale => rescaling pixel value from 0 to 255 to 0 to 1\n", |
|  | "#shear\_range=> counter clock wise rotation(anti clock)" |
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|  | "print(x\_test.class\_indices)" |
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|  | "c(x\_train .labels)" |
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|  | "model = Sequential()" |
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|  | "model.add(Convolution2D(32,(3,3),input\_shape=(64,64,3),activation=\"relu\"))\n", |
|  | "# 32 indicates => no of feature detectors\n", |
|  | "#(3,3)=> kernel size (feature detector size)" |
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|  | "model.add(Flatten())" |
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|  | "# add flatten layer => input to your ANN" |
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|  | " conv2d (Conv2D) (None, 62, 62, 32) 896 \n", |
|  | " \n", |
|  | " max\_pooling2d (MaxPooling2D (None, 31, 31, 32) 0 \n", |
|  | " ) \n", |
|  | " \n", |
|  | " conv2d\_1 (Conv2D) (None, 29, 29, 32) 9248 \n", |
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|  | " max\_pooling2d\_1 (MaxPooling (None, 14, 14, 32) 0 \n", |
|  | " 2D) \n", |
|  | " \n", |
|  | " flatten (Flatten) (None, 6272) 0 \n", |
|  | " \n", |
|  | " dense (Dense) (None, 128) 802944 \n", |
|  | " \n", |
|  | " dense\_1 (Dense) (None, 5) 645 \n", |
|  | " \n", |
|  | " flatten\_1 (Flatten) (None, 5) 0 \n", |
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|  | "=================================================================\n", |
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|  | "model.compile(loss=\"binary\_crossentropy\",optimizer=\"adam\",metrics=['accuracy'])" |
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|  | " \"\"\"Entry point for launching an IPython kernel.\n" |
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|  | "Epoch 1/20\n", |
|  | "129/129 [==============================] - 2459s 19s/step - loss: -0.0526 - accuracy: 0.3273 - val\_loss: 0.1126 - val\_accuracy: 0.4467\n", |
|  | "Epoch 2/20\n", |
|  | "129/129 [==============================] - 36s 277ms/step - loss: -3.0746 - accuracy: 0.3288 - val\_loss: 0.2155 - val\_accuracy: 0.4467\n", |
|  | "Epoch 3/20\n", |
|  | "129/129 [==============================] - 35s 268ms/step - loss: -8.7866 - accuracy: 0.3288 - val\_loss: 0.5095 - val\_accuracy: 0.4467\n", |
|  | "Epoch 4/20\n", |
|  | "129/129 [==============================] - 36s 281ms/step - loss: -17.7107 - accuracy: 0.3288 - val\_loss: 0.9337 - val\_accuracy: 0.4467\n", |
|  | "Epoch 5/20\n", |
|  | "129/129 [==============================] - 36s 282ms/step - loss: -29.8704 - accuracy: 0.3288 - val\_loss: 1.4811 - val\_accuracy: 0.4467\n", |
|  | "Epoch 6/20\n", |
|  | "129/129 [==============================] - 36s 277ms/step - loss: -45.0273 - accuracy: 0.3288 - val\_loss: 2.1422 - val\_accuracy: 0.4467\n", |
|  | "Epoch 7/20\n", |
|  | "129/129 [==============================] - 35s 269ms/step - loss: -62.9152 - accuracy: 0.3288 - val\_loss: 2.9106 - val\_accuracy: 0.4467\n", |
|  | "Epoch 8/20\n", |
|  | "129/129 [==============================] - 40s 309ms/step - loss: -83.5868 - accuracy: 0.3288 - val\_loss: 3.7855 - val\_accuracy: 0.4467\n", |
|  | "Epoch 9/20\n", |
|  | "129/129 [==============================] - 36s 281ms/step - loss: -106.7443 - accuracy: 0.3288 - val\_loss: 4.7640 - val\_accuracy: 0.4467\n", |
|  | "Epoch 10/20\n", |
|  | "129/129 [==============================] - 36s 278ms/step - loss: -132.3641 - accuracy: 0.3288 - val\_loss: 5.8398 - val\_accuracy: 0.4467\n", |
|  | "Epoch 11/20\n", |
|  | "129/129 [==============================] - 35s 271ms/step - loss: -160.3758 - accuracy: 0.3288 - val\_loss: 7.0081 - val\_accuracy: 0.4467\n", |
|  | "Epoch 12/20\n", |
|  | "129/129 [==============================] - 35s 269ms/step - loss: -190.6966 - accuracy: 0.3288 - val\_loss: 8.2454 - val\_accuracy: 0.4467\n", |
|  | "Epoch 13/20\n", |
|  | "129/129 [==============================] - 36s 279ms/step - loss: -223.1146 - accuracy: 0.3288 - val\_loss: 9.6145 - val\_accuracy: 0.4467\n", |
|  | "Epoch 14/20\n", |
|  | "129/129 [==============================] - 36s 280ms/step - loss: -257.9082 - accuracy: 0.3288 - val\_loss: 11.0088 - val\_accuracy: 0.4467\n", |
|  | "Epoch 15/20\n", |
|  | "129/129 [==============================] - 37s 290ms/step - loss: -294.5687 - accuracy: 0.3288 - val\_loss: 12.5175 - val\_accuracy: 0.4467\n", |
|  | "Epoch 16/20\n", |
|  | "129/129 [==============================] - 34s 266ms/step - loss: -333.2441 - accuracy: 0.3288 - val\_loss: 14.1130 - val\_accuracy: 0.4467\n", |
|  | "Epoch 17/20\n", |
|  | "129/129 [==============================] - 36s 279ms/step - loss: -374.0325 - accuracy: 0.3288 - val\_loss: 15.7641 - val\_accuracy: 0.4467\n", |
|  | "Epoch 18/20\n", |
|  | "129/129 [==============================] - 36s 278ms/step - loss: -416.7053 - accuracy: 0.3288 - val\_loss: 17.5287 - val\_accuracy: 0.4467\n", |
|  | "Epoch 19/20\n", |
|  | "129/129 [==============================] - 35s 267ms/step - loss: -461.2285 - accuracy: 0.3288 - val\_loss: 19.3238 - val\_accuracy: 0.4467\n", |
|  | "Epoch 20/20\n", |
|  | "129/129 [==============================] - 34s 265ms/step - loss: -507.5266 - accuracy: 0.3288 - val\_loss: 21.2192 - val\_accuracy: 0.4467\n" |
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|  | "img = load\_img(r'/content/drive/MyDrive/ibm project/Sample\_Images-20221102T071233Z-001/Sample\_Images/Test\_Image3.jpg', grayscale=False,target\_size=(64,64))\n", |
|  | "#image to array \n", |
|  | "x = img\_to\_array(img)\n", |
|  | "#changing the shape\n", |
|  | "x= np.expand\_dims(x,axis = 0)\n", |
|  | "predict\_x=model.predict(x)\n", |
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