IBM Project Name: Real-Time Communication System Powered by AI for Specially Abled

TEAM ID: PNT2022TMID30422

```
from tensorflow.keras.models import Sequential

from tensorflow.keras.layers import Dense, Conv2D, Flatten, Dropout, MaxPooling2Dfrom

tensorflow.keras.preprocessing.image import ImageDataGenerator

import numpy as np

import matplotlib.pyplot as plt

import cv2
```

unzip the file

```
!unzip '/content/drive/MyDrive/IBMPROJECT/conversation engine for deaf and dumb.zip'Streaming

output truncated to the last 5000 lines.
 extracting: Dataset/training_set/G/1225.png
 extracting: Dataset/training_set/G/1226.png
 extracting: Dataset/training_set/G/1227.png
 extracting: Dataset/training_set/G/1228.png
 extracting: Dataset/training_set/G/1229.png
 inflating: Dataset/training_set/G/123.png
 extracting: Dataset/training_set/G/1230.png
 extracting: Dataset/training_set/G/1231.png
 extracting: Dataset/training_set/G/1232.png
 inflating: Dataset/training_set/G/1233.png
 inflating: Dataset/training_set/G/1234.png
 inflating: Dataset/training_set/G/1235.png
 inflating: Dataset/training_set/G/1236.png
```

```
  inflating: Dataset/training_set/G/1237.png
inflating: Dataset/training_set/G/1238.png
inflating: Dataset/training_set/G/1239.png
inflating: Dataset/training_set/G/124.png
inflating: Dataset/training_set/G/1240.png
inflating: Dataset/training_set/G/1241.png
inflating: Dataset/training_set/G/1242.png
inflating: Dataset/training_set/G/1243.png
inflating: Dataset/training_set/G/1244.png
inflating: Dataset/training_set/G/1245.png
extracting: Dataset/training_set/G/1246.png
inflating: Dataset/training_set/G/1247.png
inflating: Dataset/training_set/G/1248.png
inflating: Dataset/training_set/G/1249.png
inflating: Dataset/training_set/G/125.png
inflating: Dataset/training_set/G/1250.png
inflating: Dataset/training_set/G/1251.png
inflating: Dataset/training_set/G/1252.png
inflating: Dataset/training_set/G/1253.png
inflating: Dataset/training_set/G/1254.png
inflating: Dataset/training_set/G/1255.png
inflating: Dataset/training_set/G/1256.png
inflating: Dataset/training_set/G/1257.png
inflating: Dataset/training_set/G/1258.png
inflating: Dataset/training_set/G/1259.png
```

```
inflating: Dataset/training_set/G/126.png
inflating: Dataset/training_set/G/1260.png
inflating: Dataset/training_set/G/1261.png
extracting: Dataset/training_set/G/1262.png
inflating: Dataset/training_set/G/1263.png
inflating: Dataset/training_set/G/1264.png
inflating: Dataset/training_set/G/1265.png
inflating: Dataset/training_set/G/1266.png
inflating: Dataset/training_set/G/1267.png
extracting: Dataset/training_set/G/1268.png
inflating: Dataset/training_set/G/1269.png
inflating: Dataset/training_set/G/127.png
inflating: Dataset/training_set/G/1270.png
inflating: Dataset/training_set/G/1271.png
inflating: Dataset/training_set/G/1272.png
inflating: Dataset/training_set/G/1273.png
inflating: Dataset/training_set/G/1274.png
inflating: Dataset/training_set/G/1275.png
inflating: Dataset/training_set/G/1276.png
inflating: Dataset/training_set/G/1277.png
inflating: Dataset/training_set/G/1278.png
inflating: Dataset/training_set/G/1279.png
inflating: Dataset/training_set/G/128.png
inflating: Dataset/training_set/G/1280.png
inflating: Dataset/training_set/G/1281.png
```

inflating: Dataset/training_set/G/1282.png

inflating: Dataset/training_set/G/1283.png

inflating: Dataset/training_set/G/1284.png

inflating: Dataset/training_set/G/1285.png

inflating: Dataset/training_set/G/1286.png

inflating: Dataset/training_set/G/1287.png

inflating: Dataset/training_set/G/1288.png

inflating: Dataset/training_set/G/1289.png

inflating: Dataset/training_set/G/129.png

inflating: Dataset/training_set/G/1290.png

inflating: Dataset/training_set/G/1291.png

inflating: Dataset/training_set/G/1292.png

inflating: Dataset/training_set/G/1293.png

inflating: Dataset/training_set/G/1294.png

inflating: Dataset/training_set/G/1295.png

inflating: Dataset/training_set/G/1296.png

inflating: Dataset/training_set/G/1297.png

inflating: Dataset/training_set/G/1298.png

inflating: Dataset/training_set/G/1299.png

inflating: Dataset/training_set/G/13.png

inflating: Dataset/training_set/G/130.png

inflating: Dataset/training_set/G/1300.png

inflating: Dataset/training_set/G/1301.png

inflating: Dataset/training_set/G/1302.png

inflating: Dataset/training_set/G/1303.png

inflating: Dataset/training_set/G/1382.png

inflating: Dataset/training_set/G/1305.png

inflating: Dataset/training_set/G/1306.png

inflating: Dataset/training_set/G/1307.png

inflating: Dataset/training_set/G/1308.png

inflating: Dataset/training_set/G/1309.png

inflating: Dataset/training_set/G/131.png

inflating: Dataset/training_set/G/1310.png

inflating: Dataset/training_set/G/1311.png

inflating: Dataset/training_set/G/1312.png

inflating: Dataset/training_set/G/1313.png

inflating: Dataset/training_set/G/1314.png

inflating: Dataset/training_set/G/1315.png

inflating: Dataset/training_set/G/1316.png

inflating: Dataset/training_set/G/1317.png

inflating: Dataset/training_set/G/1318.png

inflating: Dataset/training_set/G/1319.png

inflating: Dataset/training_set/G/132.png

inflating: Dataset/training_set/G/1320.png

inflating: Dataset/training_set/G/1321.png

inflating: Dataset/training_set/G/1322.png

inflating: Dataset/training_set/G/1323.png

inflating: Dataset/training_set/G/1324.png

inflating: Dataset/training_set/G/1325.png

inflating: Dataset/training_set/G/1326.png

```
inflating: Dataset/training_set/G/1327.png
inflating: Dataset/training_set/G/1328.png
inflating: Dataset/training_set/G/1329.png
inflating: Dataset/training_set/G/133.png
inflating: Dataset/training_set/G/1330.png
inflating: Dataset/training_set/G/1331.png
inflating: Dataset/training_set/G/1332.png
inflating: Dataset/training_set/G/1333.png
inflating: Dataset/training_set/G/1334.png
inflating: Dataset/training_set/G/1335.png
inflating: Dataset/training_set/G/1336.png
inflating: Dataset/training_set/G/1337.png
inflating: Dataset/training_set/G/1338.png
inflating: Dataset/training_set/G/1339.png
inflating: Dataset/training_set/G/134.png
inflating: Dataset/training_set/G/1340.png
inflating: Dataset/training_set/G/1341.png
inflating: Dataset/training_set/G/1342.png
inflating: Dataset/training_set/G/1343.png
inflating: Dataset/training_set/G/1344.png
inflating: Dataset/training_set/G/1345.png
inflating: Dataset/training_set/G/1346.png
inflating: Dataset/training_set/G/1347.png
inflating: Dataset/training_set/G/1348.png
extracting: Dataset/training_set/G/1349.png
```

```
inflating: Dataset/training_set/G/135.png
inflating: Dataset/training_set/G/1350.png
inflating: Dataset/training_set/G/1351.png
inflating: Dataset/training_set/G/1352.png
inflating: Dataset/training_set/G/1353.png
inflating: Dataset/training_set/G/1354.png
inflating: Dataset/training_set/G/1355.png
inflating: Dataset/training_set/G/1356.png
inflating: Dataset/training_set/G/1357.png
inflating: Dataset/training_set/G/1358.png
inflating: Dataset/training_set/G/1359.png
inflating: Dataset/training_set/G/136.png
inflating: Dataset/training_set/G/1360.png
inflating: Dataset/training_set/G/1361.png
inflating: Dataset/training_set/G/1362.png
inflating: Dataset/training_set/G/1363.png
inflating: Dataset/training_set/G/1364.png
inflating: Dataset/training_set/G/1365.png
inflating: Dataset/training_set/G/1366.png
inflating: Dataset/training_set/G/1367.png
inflating: Dataset/training_set/G/1368.png
inflating: Dataset/training_set/G/1369.png
inflating: Dataset/training_set/G/137.png
inflating: Dataset/training_set/G/1370.png
inflating: Dataset/training_set/G/1371.png
```

inflating: Dataset/training_set/G/1372.png

 inflating: Dataset/training_set/G/1373.png

inflating: Dataset/training_set/G/1374.png

inflating: Dataset/training_set/G/1375.png

inflating: Dataset/training_set/G/1376.png

inflating: Dataset/training_set/G/1377.png

inflating: Dataset/training_set/G/1378.png

extracting: Dataset/training_set/G/1379.png

inflating: Dataset/training_set/G/138.png

inflating: Dataset/training_set/G/1380.png

inflating: Dataset/training_set/G/1381.png

inflating: Dataset/training_set/G/1382.png

inflating: Dataset/training_set/G/1383.png

inflating: Dataset/training_set/G/1384.png

inflating: Dataset/training_set/G/1385.png

inflating: Dataset/training_set/G/1386.png

inflating: Dataset/training_set/G/1387.png

inflating: Dataset/training_set/G/1388.png

inflating: Dataset/training_set/G/1389.png

inflating: Dataset/training_set/G/139.png

inflating: Dataset/training_set/G/1390.png

inflating: Dataset/training_set/G/1391.png

inflating: Dataset/training_set/G/1392.png

inflating: Dataset/training_set/G/1393.png

inflating: Dataset/training_set/G/1394.png

inflating: Dataset/training_set/G/1395.png

inflating: Dataset/training_set/G/1396.png

inflating: Dataset/training_set/G/1397.png

inflating: Dataset/training_set/G/1398.png

inflating: Dataset/training_set/G/1399.png

inflating: Dataset/training_set/G/14.png

inflating: Dataset/training_set/G/140.png

inflating: Dataset/training_set/G/1400.png

inflating: Dataset/training_set/G/1401.png

inflating: Dataset/training_set/G/1402.png

inflating: Dataset/training_set/G/1403.png

inflating: Dataset/training_set/G/1404.png

inflating: Dataset/training_set/G/1405.png

inflating: Dataset/training_set/G/1406.png

inflating: Dataset/training_set/G/1407.png

inflating: Dataset/training_set/G/1408.png

inflating: Dataset/training_set/G/1409.png

inflating: Dataset/training_set/G/141.png

inflating: Dataset/training_set/G/1410.png

inflating: Dataset/training_set/G/1411.png

inflating: Dataset/training_set/G/1412.png

inflating: Dataset/training_set/G/1413.png

inflating: Dataset/training_set/G/1414.png

inflating: Dataset/training_set/G/1415.png

inflating: Dataset/training_set/G/1416.png

inflating: Dataset/training_set/G/1417.png

inflating: Dataset/training_set/G/1418.png

inflating: Dataset/training_set/G/1419.png

inflating: Dataset/training_set/G/142.png

inflating: Dataset/training_set/G/1420.png

inflating: Dataset/training_set/G/1421.png

inflating: Dataset/training_set/G/1422.png

inflating: Dataset/training_set/G/1423.png

inflating: Dataset/training_set/G/1424.png

inflating: Dataset/training_set/G/1425.png

inflating: Dataset/training_set/G/1426.png

inflating: Dataset/training_set/G/1427.png

inflating: Dataset/training_set/G/1428.png

inflating: Dataset/training_set/G/1429.png

inflating: Dataset/training_set/G/143.png

inflating: Dataset/training_set/G/1430.png

inflating: Dataset/training_set/G/1431.png

inflating: Dataset/training_set/G/1432.png

inflating: Dataset/training_set/G/1433.png

inflating: Dataset/training_set/G/1434.png

inflating: Dataset/training_set/G/1435.png

inflating: Dataset/training_set/G/1436.png

inflating: Dataset/training_set/G/1437.png

inflating: Dataset/training_set/G/1438.png

inflating: Dataset/training_set/G/1439.png

inflating: Dataset/training_set/G/144.png

inflating: Dataset/training_set/G/1440.png

inflating: Dataset/training_set/G/1441.png

inflating: Dataset/training_set/G/1442.png

inflating: Dataset/training_set/G/1443.png

inflating: Dataset/training_set/G/1444.png

inflating: Dataset/training_set/G/1445.png

inflating: Dataset/training_set/G/1446.png

inflating: Dataset/training_set/G/1447.png

inflating: Dataset/training_set/G/1448.png

inflating: Dataset/training_set/G/1449.png

inflating: Dataset/training_set/G/145.png

inflating: Dataset/training_set/G/1450.png

inflating: Dataset/training_set/G/1451.png

inflating: Dataset/training_set/G/1452.png

inflating: Dataset/training_set/G/1453.png

inflating: Dataset/training_set/G/1454.png

inflating: Dataset/training_set/G/1455.png

inflating: Dataset/training_set/G/1456.png

inflating: Dataset/training_set/G/1457.png

inflating: Dataset/training_set/G/1458.png

inflating: Dataset/training_set/G/1459.png

inflating: Dataset/training_set/G/146.png

inflating: Dataset/training_set/G/1460.png

inflating: Dataset/training_set/G/1461.png

inflating: Dataset/training_set/G/1462.png

inflating: Dataset/training_set/G/1463.png

inflating: Dataset/training_set/G/1464.png

inflating: Dataset/training_set/G/1465.png

inflating: Dataset/training_set/G/1466.png

inflating: Dataset/training_set/G/1467.png

inflating: Dataset/training_set/G/1468.png

inflating: Dataset/training_set/G/1469.png

inflating: Dataset/training_set/G/147.png

inflating: Dataset/training_set/G/1470.png

inflating: Dataset/training_set/G/1471.png

inflating: Dataset/training_set/G/1472.png

inflating: Dataset/training_set/G/1473.png

inflating: Dataset/training_set/G/1474.png

inflating: Dataset/training_set/G/1475.png

inflating: Dataset/training_set/G/1476.png

inflating: Dataset/training_set/G/1477.png

inflating: Dataset/training_set/G/1478.png

inflating: Dataset/training_set/G/1479.png

inflating: Dataset/training_set/G/148.png

inflating: Dataset/training_set/G/1480.png

inflating: Dataset/training_set/G/1481.png

inflating: Dataset/training_set/G/1482.png

inflating: Dataset/training_set/G/1483.png

inflating: Dataset/training_set/G/1484.png

inflating: Dataset/training_set/G/1485.png
inflating: Dataset/training_set/G/1486.png
inflating: Dataset/training_set/G/1487.png
inflating: Dataset/training_set/G/1488.png
inflating: Dataset/training_set/G/1489.png
inflating: Dataset/training_set/G/149.png
inflating: Dataset/training_set/G/1490.png
inflating: Dataset/training_set/G/1491.png
inflating: Dataset/training_set/G/1492.png
inflating: Dataset/training_set/G/1493.png
inflating: Dataset/training_set/G/1494.png
inflating: Dataset/training_set/G/1495.png
inflating: Dataset/training_set/G/1496.png
inflating: Dataset/training_set/G/1497.png
inflating: Dataset/training_set/G/1498.png
inflating: Dataset/training_set/G/1499.png
inflating: Dataset/training_set/G/15.png
inflating: Dataset/training_set/G/150.png
inflating: Dataset/training_set/G/1500.png
inflating: Dataset/training_set/G/1501.png
inflating: Dataset/training_set/G/1502.png
inflating: Dataset/training_set/G/1503.png
inflating: Dataset/training_set/G/1508.png
inflating: Dataset/training_set/G/1509.png
inflating: Dataset/training_set/G/151.png

inflating: Dataset/training_set/G/1510.png

inflating: Dataset/training_set/G/1511.png

inflating: Dataset/training_set/G/1512.png

inflating: Dataset/training_set/G/1513.png

inflating: Dataset/training_set/G/1514.png

inflating: Dataset/training_set/G/1515.png

inflating: Dataset/training_set/G/1516.png

inflating: Dataset/training_set/G/1517.png

inflating: Dataset/training_set/G/1518.png

inflating: Dataset/training_set/G/1519.png

inflating: Dataset/training_set/G/152.png

inflating: Dataset/training_set/G/1520.png

inflating: Dataset/training_set/G/1521.png

inflating: Dataset/training_set/G/1522.png

inflating: Dataset/training_set/G/1523.png

inflating: Dataset/training_set/G/1524.png

inflating: Dataset/training_set/G/1525.png

inflating: Dataset/training_set/G/1526.png

inflating: Dataset/training_set/G/1527.png

inflating: Dataset/training_set/G/1528.png

inflating: Dataset/training_set/G/1529.png

inflating: Dataset/training_set/G/153.png

inflating: Dataset/training_set/G/1530.png

inflating: Dataset/training_set/G/1531.png

inflating: Dataset/training_set/G/1532.png

inflating: Dataset/training_set/G/1533.png

inflating: Dataset/training_set/G/1534.png

inflating: Dataset/training_set/G/1535.png

inflating: Dataset/training_set/G/1536.png

inflating: Dataset/training_set/G/1537.png

inflating: Dataset/training_set/G/1538.png

inflating: Dataset/training_set/G/1539.png

inflating: Dataset/training_set/G/154.png

inflating: Dataset/training_set/G/1540.png

inflating: Dataset/training_set/G/1541.png

inflating: Dataset/training_set/G/1542.png

inflating: Dataset/training_set/G/1543.png

inflating: Dataset/training_set/G/1544.png

inflating: Dataset/training_set/G/1545.png

inflating: Dataset/training_set/G/1546.png

inflating: Dataset/training_set/G/1547.png

inflating: Dataset/training_set/G/1548.png

inflating: Dataset/training_set/G/1549.png

inflating: Dataset/training_set/G/155.png

inflating: Dataset/training_set/G/1550.png

inflating: Dataset/training_set/G/1551.png

inflating: Dataset/training_set/G/1552.png

inflating: Dataset/training_set/G/1553.png

inflating: Dataset/training_set/G/1554.png

inflating: Dataset/training_set/G/1555.png

inflating: Dataset/training_set/G/1556.png

inflating: Dataset/training_set/G/1557.png

inflating: Dataset/training_set/G/1558.png

inflating: Dataset/training_set/G/1559.png

inflating: Dataset/training_set/G/156.png

inflating: Dataset/training_set/G/1560.png

inflating: Dataset/training_set/G/1561.png

inflating: Dataset/training_set/G/1562.png

inflating: Dataset/training_set/G/1563.png

inflating: Dataset/training_set/G/1564.png

inflating: Dataset/training_set/G/1565.png

inflating: Dataset/training_set/G/1566.png

inflating: Dataset/training_set/G/1567.png

inflating: Dataset/training_set/G/1568.png

inflating: Dataset/training_set/G/1569.png

inflating: Dataset/training_set/G/157.png

inflating: Dataset/training_set/G/1570.png

inflating: Dataset/training_set/G/1571.png

inflating: Dataset/training_set/G/1572.png

inflating: Dataset/training_set/G/1573.png

inflating: Dataset/training_set/G/1574.png

inflating: Dataset/training_set/G/1575.png

inflating: Dataset/training_set/G/1576.png

inflating: Dataset/training_set/G/1577.png

inflating: Dataset/training_set/G/1578.png

inflating: Dataset/training_set/G/1579.png

inflating: Dataset/training_set/G/158.png

inflating: Dataset/training_set/G/1580.png

inflating: Dataset/training_set/G/1581.png

inflating: Dataset/training_set/G/1582.png

inflating: Dataset/training_set/G/1583.png

inflating: Dataset/training_set/G/1584.png

inflating: Dataset/training_set/G/1585.png

inflating: Dataset/training_set/G/1586.png

inflating: Dataset/training_set/G/1587.png

inflating: Dataset/training_set/G/1588.png

inflating: Dataset/training_set/G/1589.png

inflating: Dataset/training_set/G/159.png

inflating: Dataset/training_set/G/1590.png

inflating: Dataset/training_set/G/1591.png

inflating: Dataset/training_set/G/1592.png

inflating: Dataset/training_set/G/1593.png

inflating: Dataset/training_set/G/1594.png

inflating: Dataset/training_set/G/1595.png

inflating: Dataset/training_set/G/1596.png

inflating: Dataset/training_set/G/1597.png

inflating: Dataset/training_set/G/1598.png

inflating: Dataset/training_set/G/1599.png

inflating: Dataset/training_set/G/16.png

inflating: Dataset/training_set/G/160.png

inflating: Dataset/training_set/G/1600.png

inflating: Dataset/training_set/G/1601.png

inflating: Dataset/training_set/G/1602.png

inflating: Dataset/training_set/G/1603.png

inflating: Dataset/training_set/G/1604.png

inflating: Dataset/training_set/G/1605.png

inflating: Dataset/training_set/G/1606.png

inflating: Dataset/training_set/G/1607.png

inflating: Dataset/training_set/G/1608.png

inflating: Dataset/training_set/G/1609.png

inflating: Dataset/training_set/G/161.png

inflating: Dataset/training_set/G/1610.png

inflating: Dataset/training_set/G/1611.png

inflating: Dataset/training_set/G/1612.png

inflating: Dataset/training_set/G/1613.png

inflating: Dataset/training_set/G/1614.png

inflating: Dataset/training_set/G/1615.png

inflating: Dataset/training_set/G/1616.png

inflating: Dataset/training_set/G/1617.png

inflating: Dataset/training_set/G/1618.png

inflating: Dataset/training_set/G/1619.png

inflating: Dataset/training_set/G/162.png

inflating: Dataset/training_set/G/1620.png

inflating: Dataset/training_set/G/1621.png

inflating: Dataset/training_set/G/1622.png

inflating: Dataset/training_set/G/1623.png

inflating: Dataset/training_set/G/1624.png

inflating: Dataset/training_set/G/1625.png

inflating: Dataset/training_set/G/1626.png

inflating: Dataset/training_set/G/1627.png

inflating: Dataset/training_set/G/1628.png

inflating: Dataset/training_set/G/1629.png

inflating: Dataset/training_set/G/163.png

inflating: Dataset/training_set/G/1630.png

inflating: Dataset/training_set/G/1631.png

inflating: Dataset/training_set/G/1632.png

inflating: Dataset/training_set/G/1633.png

inflating: Dataset/training_set/G/1634.png

inflating: Dataset/training_set/G/1635.png

inflating: Dataset/training_set/G/1636.png

inflating: Dataset/training_set/G/1637.png

inflating: Dataset/training_set/G/1638.png

inflating: Dataset/training_set/G/1639.png

inflating: Dataset/training_set/G/164.png

inflating: Dataset/training_set/G/1640.png

inflating: Dataset/training_set/G/1641.png

inflating: Dataset/training_set/G/1642.png

inflating: Dataset/training_set/G/1643.png

inflating: Dataset/training_set/G/1644.png

inflating: Dataset/training_set/G/1645.png

inflating: Dataset/training_set/G/1646.png

inflating: Dataset/training_set/G/1647.png

inflating: Dataset/training_set/G/1648.png

inflating: Dataset/training_set/G/1649.png

inflating: Dataset/training_set/G/165.png

inflating: Dataset/training_set/G/1650.png

inflating: Dataset/training_set/G/1651.png

inflating: Dataset/training_set/G/1652.png

inflating: Dataset/training_set/G/1653.png

inflating: Dataset/training_set/G/1654.png

inflating: Dataset/training_set/G/1655.png

inflating: Dataset/training_set/G/1656.png

inflating: Dataset/training_set/G/1657.png

inflating: Dataset/training_set/G/1658.png

inflating: Dataset/training_set/G/1659.png

inflating: Dataset/training_set/G/166.png

inflating: Dataset/training_set/G/1660.png

inflating: Dataset/training_set/G/1661.png

inflating: Dataset/training_set/G/1662.png

inflating: Dataset/training_set/G/1663.png

inflating: Dataset/training_set/G/1664.png

inflating: Dataset/training_set/G/1665.png

inflating: Dataset/training_set/G/1666.png

inflating: Dataset/training_set/G/1667.png

inflating: Dataset/training_set/G/1668.png

inflating: Dataset/training_set/G/1669.png

inflating: Dataset/training_set/G/167.png

inflating: Dataset/training_set/G/1670.png

inflating: Dataset/training_set/G/1671.png

inflating: Dataset/training_set/G/1672.png

inflating: Dataset/training_set/G/1673.png

inflating: Dataset/training_set/G/1674.png

inflating: Dataset/training_set/G/1675.png

inflating: Dataset/training_set/G/1676.png

inflating: Dataset/training_set/G/1677.png

inflating: Dataset/training_set/G/1678.png

inflating: Dataset/training_set/G/1679.png

inflating: Dataset/training_set/G/168.png

inflating: Dataset/training_set/G/1680.png

inflating: Dataset/training_set/G/1681.png

inflating: Dataset/training_set/G/1682.png

inflating: Dataset/training_set/G/1683.png

inflating: Dataset/training_set/G/1684.png

inflating: Dataset/training_set/G/1685.png

inflating: Dataset/training_set/G/1686.png

inflating: Dataset/training_set/G/1687.png

inflating: Dataset/training_set/G/1688.png

inflating: Dataset/training_set/G/1689.png

inflating: Dataset/training_set/G/169.png

inflating: Dataset/training_set/G/1690.png

inflating: Dataset/training_set/G/1691.png

inflating: Dataset/training_set/G/1692.png

inflating: Dataset/training_set/G/1693.png

inflating: Dataset/training_set/G/1694.png

inflating: Dataset/training_set/G/1695.png

inflating: Dataset/training_set/G/1696.png

inflating: Dataset/training_set/G/1697.png

inflating: Dataset/training_set/G/1698.png

inflating: Dataset/training_set/G/1699.png

inflating: Dataset/training_set/G/17.png

inflating: Dataset/training_set/G/170.png

inflating: Dataset/training_set/G/1700.png

inflating: Dataset/training_set/G/1701.png

inflating: Dataset/training_set/G/1702.png

inflating: Dataset/training_set/G/1703.png

inflating: Dataset/training_set/G/1704.png

inflating: Dataset/training_set/G/1705.png

inflating: Dataset/training_set/G/1706.png

inflating: Dataset/training_set/G/1707.png

inflating: Dataset/training_set/G/1708.png

inflating: Dataset/training_set/G/1709.png

inflating: Dataset/training_set/G/171.png

inflating: Dataset/training_set/G/1710.png

inflating: Dataset/training_set/G/1711.png

inflating: Dataset/training_set/G/1712.png

inflating: Dataset/training_set/G/1713.png

inflating: Dataset/training_set/G/1714.png

inflating: Dataset/training_set/G/1715.png

inflating: Dataset/training_set/G/1716.png

inflating: Dataset/training_set/G/1717.png

inflating: Dataset/training_set/G/1718.png

inflating: Dataset/training_set/G/1719.png

inflating: Dataset/training_set/G/172.png

inflating: Dataset/training_set/G/1720.png

inflating: Dataset/training_set/G/1721.png

inflating: Dataset/training_set/G/1722.png

inflating: Dataset/training_set/G/1723.png

inflating: Dataset/training_set/G/1724.png

inflating: Dataset/training_set/G/1725.png

inflating: Dataset/training_set/G/1726.png

inflating: Dataset/training_set/G/1727.png

inflating: Dataset/training_set/G/1728.png

inflating: Dataset/training_set/G/1729.png

inflating: Dataset/training_set/G/173.png

inflating: Dataset/training_set/G/1730.png

inflating: Dataset/training_set/G/1731.png

inflating: Dataset/training_set/G/1732.png

inflating: Dataset/training_set/G/1733.png

inflating: Dataset/training_set/G/1734.png

inflating: Dataset/training_set/G/1735.png

inflating: Dataset/training_set/G/1736.png

inflating: Dataset/training_set/G/1737.png

inflating: Dataset/training_set/G/1738.png

inflating: Dataset/training_set/G/1739.png

inflating: Dataset/training_set/G/174.png

inflating: Dataset/training_set/G/1740.png

inflating: Dataset/training_set/G/1741.png

inflating: Dataset/training_set/G/1742.png

inflating: Dataset/training_set/G/1743.png

inflating: Dataset/training_set/G/1744.png

inflating: Dataset/training_set/G/1745.png

inflating: Dataset/training_set/G/1746.png

inflating: Dataset/training_set/G/1747.png

inflating: Dataset/training_set/G/1748.png

inflating: Dataset/training_set/G/1749.png

inflating: Dataset/training_set/G/175.png

inflating: Dataset/training_set/G/1750.png

inflating: Dataset/training_set/G/176.png

inflating: Dataset/training_set/G/177.png

inflating: Dataset/training_set/G/178.png

inflating: Dataset/training_set/G/179.png

inflating: Dataset/training_set/G/18.png

inflating: Dataset/training_set/G/180.png

inflating: Dataset/training_set/G/181.png

inflating: Dataset/training_set/G/182.png

inflating: Dataset/training_set/G/183.png

inflating: Dataset/training_set/G/184.png

inflating: Dataset/training_set/G/185.png

inflating: Dataset/training_set/G/186.png

inflating: Dataset/training_set/G/187.png

inflating: Dataset/training_set/G/188.png

inflating: Dataset/training_set/G/189.png

inflating: Dataset/training_set/G/19.png

inflating: Dataset/training_set/G/190.png

inflating: Dataset/training_set/G/191.png

inflating: Dataset/training_set/G/192.png

inflating: Dataset/training_set/G/193.png

inflating: Dataset/training_set/G/194.png

inflating: Dataset/training_set/G/195.png

inflating: Dataset/training_set/G/196.png

inflating: Dataset/training_set/G/197.png

inflating: Dataset/training_set/G/198.png

inflating: Dataset/training_set/G/199.png

inflating: Dataset/training_set/G/2.png

inflating: Dataset/training_set/G/20.png

inflating: Dataset/training_set/G/200.png

inflating: Dataset/training_set/G/201.png

inflating: Dataset/training_set/G/202.png

inflating: Dataset/training_set/G/203.png

inflating: Dataset/training_set/G/204.png

inflating: Dataset/training_set/G/205.png

inflating: Dataset/training_set/G/206.png

inflating: Dataset/training_set/G/207.png

inflating: Dataset/training_set/G/208.png

inflating: Dataset/training_set/G/209.png

inflating: Dataset/training_set/G/21.png

inflating: Dataset/training_set/G/210.png

inflating: Dataset/training_set/G/211.png

inflating: Dataset/training_set/G/212.png

inflating: Dataset/training_set/G/213.png

inflating: Dataset/training_set/G/214.png

inflating: Dataset/training_set/G/215.png

inflating: Dataset/training_set/G/216.png

inflating: Dataset/training_set/G/217.png

inflating: Dataset/training_set/G/218.png

inflating: Dataset/training_set/G/219.png

inflating: Dataset/training_set/G/22.png

inflating: Dataset/training_set/G/220.png

inflating: Dataset/training_set/G/221.png

inflating: Dataset/training_set/G/222.png

inflating: Dataset/training_set/G/223.png

inflating: Dataset/training_set/G/224.png

inflating: Dataset/training_set/G/225.png

inflating: Dataset/training_set/G/226.png

inflating: Dataset/training_set/G/227.png

inflating: Dataset/training_set/G/228.png

inflating: Dataset/training_set/G/229.png

inflating: Dataset/training_set/G/23.png

inflating: Dataset/training_set/G/230.png

inflating: Dataset/training_set/G/231.png

inflating: Dataset/training_set/G/232.png

inflating: Dataset/training_set/G/233.png

inflating: Dataset/training_set/G/234.png

inflating: Dataset/training_set/G/235.png

inflating: Dataset/training_set/G/236.png

inflating: Dataset/training_set/G/237.png

inflating: Dataset/training_set/G/238.png

inflating: Dataset/training_set/G/239.png

inflating: Dataset/training_set/G/24.png

inflating: Dataset/training_set/G/240.png

inflating: Dataset/training_set/G/241.png

inflating: Dataset/training_set/G/242.png

inflating: Dataset/training_set/G/243.png

inflating: Dataset/training_set/G/244.png

inflating: Dataset/training_set/G/245.png

inflating: Dataset/training_set/G/246.png

inflating: Dataset/training_set/G/247.png

inflating: Dataset/training_set/G/248.png

inflating: Dataset/training_set/G/249.png

inflating: Dataset/training_set/G/25.png

inflating: Dataset/training_set/G/250.png

inflating: Dataset/training_set/G/251.png

inflating: Dataset/training_set/G/252.png

inflating: Dataset/training_set/G/253.png

inflating: Dataset/training_set/G/254.png

inflating: Dataset/training_set/G/255.png

inflating: Dataset/training_set/G/256.png

inflating: Dataset/training_set/G/257.png

inflating: Dataset/training_set/G/258.png

inflating: Dataset/training_set/G/259.png

inflating: Dataset/training_set/G/26.png

inflating: Dataset/training_set/G/260.png

inflating: Dataset/training_set/G/261.png

inflating: Dataset/training_set/G/262.png

inflating: Dataset/training_set/G/263.png

inflating: Dataset/training_set/G/264.png

inflating: Dataset/training_set/G/265.png

inflating: Dataset/training_set/G/266.png

inflating: Dataset/training_set/G/267.png

inflating: Dataset/training_set/G/268.png

inflating: Dataset/training_set/G/269.png

inflating: Dataset/training_set/G/27.png

inflating: Dataset/training_set/G/270.png

inflating: Dataset/training_set/G/271.png

inflating: Dataset/training_set/G/272.png

inflating: Dataset/training_set/G/273.png

inflating: Dataset/training_set/G/274.png

inflating: Dataset/training_set/G/275.png

inflating: Dataset/training_set/G/276.png

inflating: Dataset/training_set/G/277.png

inflating: Dataset/training_set/G/278.png

inflating: Dataset/training_set/G/279.png

inflating: Dataset/training_set/G/28.png

inflating: Dataset/training_set/G/280.png

inflating: Dataset/training_set/G/281.png

inflating: Dataset/training_set/G/282.png

inflating: Dataset/training_set/G/283.png

inflating: Dataset/training_set/G/284.png

inflating: Dataset/training_set/G/285.png

inflating: Dataset/training_set/G/286.png

inflating: Dataset/training_set/G/287.png

inflating: Dataset/training_set/G/288.png

inflating: Dataset/training_set/G/289.png

inflating: Dataset/training_set/G/29.png

inflating: Dataset/training_set/G/290.png

inflating: Dataset/training_set/G/291.png

inflating: Dataset/training_set/G/292.png

inflating: Dataset/training_set/G/293.png

inflating: Dataset/training_set/G/294.png

inflating: Dataset/training_set/G/295.png

inflating: Dataset/training_set/G/296.png

inflating: Dataset/training_set/G/297.png

inflating: Dataset/training_set/G/298.png

inflating: Dataset/training_set/G/299.png

inflating: Dataset/training_set/G/3.png

inflating: Dataset/training_set/G/30.png

inflating: Dataset/training_set/G/300.png

inflating: Dataset/training_set/G/301.png

inflating: Dataset/training_set/G/302.png

inflating: Dataset/training_set/G/303.png

inflating: Dataset/training_set/G/304.png

inflating: Dataset/training_set/G/305.png

inflating: Dataset/training_set/G/306.png

inflating: Dataset/training_set/G/307.png

inflating: Dataset/training_set/G/308.png

inflating: Dataset/training_set/G/309.png

inflating: Dataset/training_set/G/31.png

inflating: Dataset/training_set/G/310.png

inflating: Dataset/training_set/G/311.png

inflating: Dataset/training_set/G/312.png

inflating: Dataset/training_set/G/313.png

inflating: Dataset/training_set/G/314.png

inflating: Dataset/training_set/G/315.png

inflating: Dataset/training_set/G/316.png

inflating: Dataset/training_set/G/317.png

inflating: Dataset/training_set/G/318.png

inflating: Dataset/training_set/G/319.png

inflating: Dataset/training_set/G/32.png

inflating: Dataset/training_set/G/320.png

inflating: Dataset/training_set/G/321.png

inflating: Dataset/training_set/G/322.png

inflating: Dataset/training_set/G/323.png

inflating: Dataset/training_set/G/324.png

inflating: Dataset/training_set/G/325.png

inflating: Dataset/training_set/G/326.png

inflating: Dataset/training_set/G/327.png

inflating: Dataset/training_set/G/328.png

inflating: Dataset/training_set/G/329.png

inflating: Dataset/training_set/G/33.png

inflating: Dataset/training_set/G/330.png

inflating: Dataset/training_set/G/331.png

inflating: Dataset/training_set/G/332.png

inflating: Dataset/training_set/G/333.png

inflating: Dataset/training_set/G/334.png

inflating: Dataset/training_set/G/335.png

inflating: Dataset/training_set/G/336.png

inflating: Dataset/training_set/G/337.png

inflating: Dataset/training_set/G/338.png

inflating: Dataset/training_set/G/339.png

inflating: Dataset/training_set/G/34.png

inflating: Dataset/training_set/G/340.png

inflating: Dataset/training_set/G/341.png

inflating: Dataset/training_set/G/342.png

inflating: Dataset/training_set/G/343.png

inflating: Dataset/training_set/G/344.png

inflating: Dataset/training_set/G/345.png

inflating: Dataset/training_set/G/346.png

inflating: Dataset/training_set/G/347.png

inflating: Dataset/training_set/G/348.png

inflating: Dataset/training_set/G/349.png

inflating: Dataset/training_set/G/35.png

inflating: Dataset/training_set/G/350.png

inflating: Dataset/training_set/G/351.png

inflating: Dataset/training_set/G/352.png

inflating: Dataset/training_set/G/353.png

inflating: Dataset/training_set/G/354.png

inflating: Dataset/training_set/G/355.png

inflating: Dataset/training_set/G/356.png

inflating: Dataset/training_set/G/357.png

inflating: Dataset/training_set/G/358.png

inflating: Dataset/training_set/G/359.png

inflating: Dataset/training_set/G/36.png

inflating: Dataset/training_set/G/360.png

inflating: Dataset/training_set/G/361.png

inflating: Dataset/training_set/G/362.png

inflating: Dataset/training_set/G/363.png

inflating: Dataset/training_set/G/364.png

inflating: Dataset/training_set/G/365.png

inflating: Dataset/training_set/G/366.png

inflating: Dataset/training_set/G/367.png

inflating: Dataset/training_set/G/368.png

inflating: Dataset/training_set/G/369.png

inflating: Dataset/training_set/G/37.png

inflating: Dataset/training_set/G/370.png

inflating: Dataset/training_set/G/371.png

inflating: Dataset/training_set/G/372.png

inflating: Dataset/training_set/G/373.png

inflating: Dataset/training_set/G/374.png

inflating: Dataset/training_set/G/375.png

inflating: Dataset/training_set/G/376.png

inflating: Dataset/training_set/G/377.png

inflating: Dataset/training_set/G/378.png

inflating: Dataset/training_set/G/379.png

inflating: Dataset/training_set/G/38.png

inflating: Dataset/training_set/G/380.png

inflating: Dataset/training_set/G/381.png

inflating: Dataset/training_set/G/382.png

inflating: Dataset/training_set/G/383.png

inflating: Dataset/training_set/G/384.png

inflating: Dataset/training_set/G/385.png

inflating: Dataset/training_set/G/386.png

inflating: Dataset/training_set/G/387.png

inflating: Dataset/training_set/G/388.png

inflating: Dataset/training_set/G/389.png

inflating: Dataset/training_set/G/39.png

inflating: Dataset/training_set/G/390.png

inflating: Dataset/training_set/G/391.png

inflating: Dataset/training_set/G/392.png

inflating: Dataset/training_set/G/393.png

extracting: Dataset/training_set/G/394.png

inflating: Dataset/training_set/G/395.png

inflating: Dataset/training_set/G/396.png

inflating: Dataset/training_set/G/397.png

inflating: Dataset/training_set/G/398.png

inflating: Dataset/training_set/G/399.png

inflating: Dataset/training_set/G/4.png

inflating: Dataset/training_set/G/40.png

inflating: Dataset/training_set/G/400.png

inflating: Dataset/training_set/G/401.png

inflating: Dataset/training_set/G/402.png

inflating: Dataset/training_set/G/403.png

inflating: Dataset/training_set/G/404.png

inflating: Dataset/training_set/G/405.png

inflating: Dataset/training_set/G/406.png

extracting: Dataset/training_set/G/407.png

inflating: Dataset/training_set/G/408.png

 inflating: Dataset/training_set/G/409.png

inflating: Dataset/training_set/G/41.png

inflating: Dataset/training_set/G/410.png

inflating: Dataset/training_set/G/411.png

extracting: Dataset/training_set/G/412.png

inflating: Dataset/training_set/G/413.png

inflating: Dataset/training_set/G/414.png

inflating: Dataset/training_set/G/415.png

inflating: Dataset/training_set/G/416.png

extracting: Dataset/training_set/G/417.png

inflating: Dataset/training_set/G/418.png

inflating: Dataset/training_set/G/419.png

inflating: Dataset/training_set/G/42.png

inflating: Dataset/training_set/G/420.png

inflating: Dataset/training_set/G/421.png

inflating: Dataset/training_set/G/422.png

inflating: Dataset/training_set/G/423.png

extracting: Dataset/training_set/G/424.png

inflating: Dataset/training_set/G/425.png

inflating: Dataset/training_set/G/426.png

inflating: Dataset/training_set/G/427.png

inflating: Dataset/training_set/G/428.png

inflating: Dataset/training_set/G/429.png

inflating: Dataset/training_set/G/43.png

inflating: Dataset/training_set/G/430.png

inflating: Dataset/training_set/G/431.png

inflating: Dataset/training_set/G/432.png

inflating: Dataset/training_set/G/433.png

inflating: Dataset/training_set/G/434.png

inflating: Dataset/training_set/G/435.png

inflating: Dataset/training_set/G/436.png

inflating: Dataset/training_set/G/437.png

inflating: Dataset/training_set/G/438.png

inflating: Dataset/training_set/G/439.png

inflating: Dataset/training_set/G/44.png

inflating: Dataset/training_set/G/440.png

inflating: Dataset/training_set/G/441.png

inflating: Dataset/training_set/G/442.png

inflating: Dataset/training_set/G/443.png

inflating: Dataset/training_set/G/444.png

inflating: Dataset/training_set/G/445.png

inflating: Dataset/training_set/G/446.png

inflating: Dataset/training_set/G/447.png

inflating: Dataset/training_set/G/448.png

inflating: Dataset/training_set/G/449.png

inflating: Dataset/training_set/G/45.png

inflating: Dataset/training_set/G/450.png

inflating: Dataset/training_set/G/451.png

inflating: Dataset/training_set/G/452.png

inflating: Dataset/training_set/G/453.png

 inflating: Dataset/training_set/G/454.png

inflating: Dataset/training_set/G/455.png

inflating: Dataset/training_set/G/456.png

inflating: Dataset/training_set/G/457.png

inflating: Dataset/training_set/G/458.png

inflating: Dataset/training_set/G/459.png

inflating: Dataset/training_set/G/46.png

inflating: Dataset/training_set/G/460.png

inflating: Dataset/training_set/G/461.png

inflating: Dataset/training_set/G/462.png

inflating: Dataset/training_set/G/463.png

inflating: Dataset/training_set/G/464.png

inflating: Dataset/training_set/G/465.png

inflating: Dataset/training_set/G/466.png

extracting: Dataset/training_set/G/467.png

extracting: Dataset/training_set/G/468.png

inflating: Dataset/training_set/G/469.png

inflating: Dataset/training_set/G/47.png

inflating: Dataset/training_set/G/470.png

inflating: Dataset/training_set/G/471.png

extracting: Dataset/training_set/G/472.png

extracting: Dataset/training_set/G/473.png

extracting: Dataset/training_set/G/474.png

inflating: Dataset/training_set/G/475.png

inflating: Dataset/training_set/G/476.png

extracting: Dataset/training_set/G/477.png

inflating: Dataset/training_set/G/478.png

inflating: Dataset/training_set/G/479.png

inflating: Dataset/training_set/G/48.png

extracting: Dataset/training_set/G/480.png

inflating: Dataset/training_set/G/481.png

inflating: Dataset/training_set/G/482.png

extracting: Dataset/training_set/G/483.png

inflating: Dataset/training_set/G/484.png

inflating: Dataset/training_set/G/485.png

inflating: Dataset/training_set/G/486.png

extracting: Dataset/training_set/G/487.png

inflating: Dataset/training_set/G/488.png

inflating: Dataset/training_set/G/489.png

inflating: Dataset/training_set/G/49.png

inflating: Dataset/training_set/G/490.png

inflating: Dataset/training_set/G/491.png

inflating: Dataset/training_set/G/492.png

inflating: Dataset/training_set/G/493.png

inflating: Dataset/training_set/G/494.png

inflating: Dataset/training_set/G/495.png

inflating: Dataset/training_set/G/496.png

inflating: Dataset/training_set/G/497.png

inflating: Dataset/training_set/G/498.png

inflating: Dataset/training_set/G/499.png

inflating: Dataset/training_set/G/5.png

inflating: Dataset/training_set/G/50.png

inflating: Dataset/training_set/G/500.png

inflating: Dataset/training_set/G/501.png

inflating: Dataset/training_set/I/528.png

inflating: Dataset/training_set/I/529.png

inflating: Dataset/training_set/I/53.png

inflating: Dataset/training_set/I/530.png

inflating: Dataset/training_set/I/531.png

inflating: Dataset/training_set/I/532.png

inflating: Dataset/training_set/I/533.png

extracting: Dataset/training_set/I/534.png

inflating: Dataset/training_set/I/535.png

inflating: Dataset/training_set/I/536.png

inflating: Dataset/training_set/I/537.png

inflating: Dataset/training_set/I/538.png

inflating: Dataset/training_set/I/539.png

inflating: Dataset/training_set/I/54.png

inflating: Dataset/training_set/I/540.png

extracting: Dataset/training_set/I/541.png

extracting: Dataset/training_set/I/542.png

inflating: Dataset/training_set/I/543.png

inflating: Dataset/training_set/I/544.png

inflating: Dataset/training_set/I/545.png

inflating: Dataset/training_set/I/546.png

inflating: Dataset/training_set/I/547.png

inflating: Dataset/training_set/I/548.png

inflating: Dataset/training_set/I/549.png

inflating: Dataset/training_set/I/55.png

inflating: Dataset/training_set/I/550.png

inflating: Dataset/training_set/I/551.png

inflating: Dataset/training_set/I/552.png

inflating: Dataset/training_set/I/553.png

inflating: Dataset/training_set/I/554.png

inflating: Dataset/training_set/I/555.png

inflating: Dataset/training_set/I/556.png

inflating: Dataset/training_set/I/557.png

inflating: Dataset/training_set/I/558.png

inflating: Dataset/training_set/I/559.png

inflating: Dataset/training_set/I/56.png

inflating: Dataset/training_set/I/560.png

inflating: Dataset/training_set/I/561.png

inflating: Dataset/training_set/I/562.png

inflating: Dataset/training_set/I/563.png

inflating: Dataset/training_set/I/564.png

inflating: Dataset/training_set/I/565.png

inflating: Dataset/training_set/I/566.png

inflating: Dataset/training_set/I/567.png

inflating: Dataset/training_set/I/568.png

inflating: Dataset/training_set/I/569.png

inflating: Dataset/training_set/I/57.png

inflating: Dataset/training_set/I/570.png

inflating: Dataset/training_set/I/571.png

inflating: Dataset/training_set/I/572.png

inflating: Dataset/training_set/I/573.png

extracting: Dataset/training_set/I/574.png

extracting: Dataset/training_set/I/575.png

inflating: Dataset/training_set/I/576.png

inflating: Dataset/training_set/I/577.png

inflating: Dataset/training_set/I/578.png

extracting: Dataset/training_set/I/579.png

inflating: Dataset/training_set/I/58.png

inflating: Dataset/training_set/I/580.png

inflating: Dataset/training_set/I/581.png

inflating: Dataset/training_set/I/582.png

inflating: Dataset/training_set/I/583.png

inflating: Dataset/training_set/I/584.png

inflating: Dataset/training_set/I/585.png

inflating: Dataset/training_set/I/586.png

inflating: Dataset/training_set/I/587.png

inflating: Dataset/training_set/I/588.png

inflating: Dataset/training_set/I/589.png

inflating: Dataset/training_set/I/59.png

inflating: Dataset/training_set/I/590.png

inflating: Dataset/training_set/I/591.png

extracting: Dataset/training_set/I/592.png

inflating: Dataset/training_set/I/593.png

inflating: Dataset/training_set/I/594.png

inflating: Dataset/training_set/I/595.png

inflating: Dataset/training_set/I/596.png

inflating: Dataset/training_set/I/597.png

inflating: Dataset/training_set/I/598.png

inflating: Dataset/training_set/I/599.png

inflating: Dataset/training_set/I/6.png

inflating: Dataset/training_set/I/60.png

extracting: Dataset/training_set/I/600.png

inflating: Dataset/training_set/I/601.png

inflating: Dataset/training_set/I/602.png

inflating: Dataset/training_set/I/603.png

inflating: Dataset/training_set/I/604.png

inflating: Dataset/training_set/I/605.png

inflating: Dataset/training_set/I/606.png

inflating: Dataset/training_set/I/607.png

inflating: Dataset/training_set/I/608.png

inflating: Dataset/training_set/I/609.png

inflating: Dataset/training_set/I/61.png

inflating: Dataset/training_set/I/610.png

inflating: Dataset/training_set/I/611.png

inflating: Dataset/training_set/I/612.png

inflating: Dataset/training_set/I/613.png

extracting: Dataset/training_set/I/614.png

inflating: Dataset/training_set/I/615.png

inflating: Dataset/training_set/I/616.png

inflating: Dataset/training_set/I/617.png

inflating: Dataset/training_set/I/618.png

inflating: Dataset/training_set/I/619.png

inflating: Dataset/training_set/I/62.png

inflating: Dataset/training_set/I/620.png

inflating: Dataset/training_set/I/621.png

inflating: Dataset/training_set/I/622.png

inflating: Dataset/training_set/I/623.png

inflating: Dataset/training_set/I/624.png

inflating: Dataset/training_set/I/625.png

inflating: Dataset/training_set/I/626.png

inflating: Dataset/training_set/I/627.png

inflating: Dataset/training_set/I/628.png

inflating: Dataset/training_set/I/629.png

inflating: Dataset/training_set/I/63.png

inflating: Dataset/training_set/I/630.png

inflating: Dataset/training_set/I/631.png

inflating: Dataset/training_set/I/632.png

inflating: Dataset/training_set/I/633.png

inflating: Dataset/training_set/I/634.png

inflating: Dataset/training_set/I/635.png

inflating: Dataset/training_set/I/636.png

inflating: Dataset/training_set/I/637.png

inflating: Dataset/training_set/I/638.png

inflating: Dataset/training_set/I/639.png

inflating: Dataset/training_set/I/64.png

inflating: Dataset/training_set/I/640.png

inflating: Dataset/training_set/I/641.png

inflating: Dataset/training_set/I/642.png

inflating: Dataset/training_set/I/643.png

inflating: Dataset/training_set/I/644.png

inflating: Dataset/training_set/I/645.png

inflating: Dataset/training_set/I/646.png

inflating: Dataset/training_set/I/647.png

inflating: Dataset/training_set/I/648.png

inflating: Dataset/training_set/I/649.png

inflating: Dataset/training_set/I/65.png

inflating: Dataset/training_set/I/650.png

inflating: Dataset/training_set/I/651.png

inflating: Dataset/training_set/I/652.png

inflating: Dataset/training_set/I/653.png

inflating: Dataset/training_set/I/654.png

inflating: Dataset/training_set/I/655.png

inflating: Dataset/training_set/I/656.png

extracting: Dataset/training_set/I/657.png

extracting: Dataset/training_set/I/658.png

inflating: Dataset/training_set/I/659.png

inflating: Dataset/training_set/I/66.png

inflating: Dataset/training_set/I/660.png

inflating: Dataset/training_set/I/661.png

inflating: Dataset/training_set/I/662.png

inflating: Dataset/training_set/I/663.png

extracting: Dataset/training_set/I/664.png

inflating: Dataset/training_set/I/665.png

inflating: Dataset/training_set/I/666.png

inflating: Dataset/training_set/I/667.png

inflating: Dataset/training_set/I/668.png

inflating: Dataset/training_set/I/669.png

inflating: Dataset/training_set/I/67.png

inflating: Dataset/training_set/I/670.png

inflating: Dataset/training_set/I/671.png

inflating: Dataset/training_set/I/672.png

inflating: Dataset/training_set/I/673.png

inflating: Dataset/training_set/I/674.png

inflating: Dataset/training_set/I/675.png

inflating: Dataset/training_set/I/676.png

inflating: Dataset/training_set/I/677.png

extracting: Dataset/training_set/I/678.png

inflating: Dataset/training_set/I/679.png

inflating: Dataset/training_set/I/68.png

inflating: Dataset/training_set/I/680.png

inflating: Dataset/training_set/I/681.png

inflating: Dataset/training_set/I/682.png

extracting: Dataset/training_set/I/683.png

inflating: Dataset/training_set/I/684.png

inflating: Dataset/training_set/I/685.png

inflating: Dataset/training_set/I/686.png

inflating: Dataset/training_set/I/687.png

inflating: Dataset/training_set/I/688.png

inflating: Dataset/training_set/I/689.png

inflating: Dataset/training_set/I/69.png

inflating: Dataset/training_set/I/690.png

inflating: Dataset/training_set/I/691.png

inflating: Dataset/training_set/I/692.png

inflating: Dataset/training_set/I/693.png

extracting: Dataset/training_set/I/694.png

inflating: Dataset/training_set/I/695.png

extracting: Dataset/training_set/I/696.png

extracting: Dataset/training_set/I/697.png

inflating: Dataset/training_set/I/698.png

inflating: Dataset/training_set/I/699.png

extracting: Dataset/training_set/I/7.png

extracting: Dataset/training_set/I/70.png

extracting: Dataset/training_set/I/700.png

inflating: Dataset/training_set/I/701.png

inflating: Dataset/training_set/I/702.png

inflating: Dataset/training_set/I/703.png

inflating: Dataset/training_set/I/704.png

extracting: Dataset/training_set/I/705.png

inflating: Dataset/training_set/I/706.png

inflating: Dataset/training_set/I/707.png

inflating: Dataset/training_set/I/708.png

inflating: Dataset/training_set/I/709.png

inflating: Dataset/training_set/I/71.png

inflating: Dataset/training_set/I/710.png

inflating: Dataset/training_set/I/711.png

inflating: Dataset/training_set/I/712.png

inflating: Dataset/training_set/I/713.png

inflating: Dataset/training_set/I/714.png

inflating: Dataset/training_set/I/715.png

inflating: Dataset/training_set/I/716.png

inflating: Dataset/training_set/I/717.png

inflating: Dataset/training_set/I/718.png

inflating: Dataset/training_set/I/719.png

inflating: Dataset/training_set/I/72.png

inflating: Dataset/training_set/I/720.png

inflating: Dataset/training_set/I/721.png

inflating: Dataset/training_set/I/722.png

inflating: Dataset/training_set/I/723.png

inflating: Dataset/training_set/I/724.png

inflating: Dataset/training_set/I/725.png

inflating: Dataset/training_set/I/726.png
inflating: Dataset/training_set/I/727.png
inflating: Dataset/training_set/I/728.png
inflating: Dataset/training_set/I/729.png
inflating: Dataset/training_set/I/73.png
inflating: Dataset/training_set/I/730.png
extracting: Dataset/training_set/I/731.png
inflating: Dataset/training_set/I/732.png
inflating: Dataset/training_set/I/733.png
inflating: Dataset/training_set/I/734.png
inflating: Dataset/training_set/I/735.png
inflating: Dataset/training_set/I/736.png
inflating: Dataset/training_set/I/737.png
inflating: Dataset/training_set/I/738.png
extracting: Dataset/training_set/I/739.png
inflating: Dataset/training_set/I/74.png
extracting: Dataset/training_set/I/740.png
inflating: Dataset/training_set/I/741.png
inflating: Dataset/training_set/I/742.png
inflating: Dataset/training_set/I/743.png
inflating: Dataset/training_set/I/744.png
inflating: Dataset/training_set/I/745.png
inflating: Dataset/training_set/I/746.png
extracting: Dataset/training_set/I/747.png
inflating: Dataset/training_set/I/748.png

inflating: Dataset/training_set/I/749.png

inflating: Dataset/training_set/I/75.png

inflating: Dataset/training_set/I/750.png

inflating: Dataset/training_set/I/751.png

inflating: Dataset/training_set/I/752.png

inflating: Dataset/training_set/I/753.png

inflating: Dataset/training_set/I/754.png

inflating: Dataset/training_set/I/755.png

inflating: Dataset/training_set/I/756.png

inflating: Dataset/training_set/I/757.png

inflating: Dataset/training_set/I/758.png

inflating: Dataset/training_set/I/759.png

inflating: Dataset/training_set/I/76.png

inflating: Dataset/training_set/I/760.png

inflating: Dataset/training_set/I/761.png

inflating: Dataset/training_set/I/762.png

inflating: Dataset/training_set/I/763.png

inflating: Dataset/training_set/I/764.png

extracting: Dataset/training_set/I/765.png

inflating: Dataset/training_set/I/766.png

inflating: Dataset/training_set/I/767.png

inflating: Dataset/training_set/I/768.png

inflating: Dataset/training_set/I/769.png

inflating: Dataset/training_set/I/77.png

inflating: Dataset/training_set/I/770.png

inflating: Dataset/training_set/I/771.png

inflating: Dataset/training_set/I/772.png

inflating: Dataset/training_set/I/773.png

inflating: Dataset/training_set/I/774.png

inflating: Dataset/training_set/I/775.png

inflating: Dataset/training_set/I/776.png

inflating: Dataset/training_set/I/777.png

inflating: Dataset/training_set/I/778.png

inflating: Dataset/training_set/I/779.png

inflating: Dataset/training_set/I/78.png

inflating: Dataset/training_set/I/780.png

inflating: Dataset/training_set/I/781.png

inflating: Dataset/training_set/I/782.png

inflating: Dataset/training_set/I/783.png

inflating: Dataset/training_set/I/784.png

inflating: Dataset/training_set/I/785.png

inflating: Dataset/training_set/I/786.png

inflating: Dataset/training_set/I/787.png

inflating: Dataset/training_set/I/788.png

inflating: Dataset/training_set/I/789.png

inflating: Dataset/training_set/I/79.png

inflating: Dataset/training_set/I/790.png

inflating: Dataset/training_set/I/791.png

inflating: Dataset/training_set/I/792.png

inflating: Dataset/training_set/I/793.png

extracting: Dataset/training_set/I/794.png

inflating: Dataset/training_set/I/795.png

inflating: Dataset/training_set/I/796.png

inflating: Dataset/training_set/I/797.png

inflating: Dataset/training_set/I/798.png

inflating: Dataset/training_set/I/799.png

inflating: Dataset/training_set/I/8.png

inflating: Dataset/training_set/I/80.png

inflating: Dataset/training_set/I/800.png

inflating: Dataset/training_set/I/801.png

inflating: Dataset/training_set/I/802.png

inflating: Dataset/training_set/I/803.png

inflating: Dataset/training_set/I/804.png

inflating: Dataset/training_set/I/805.png

inflating: Dataset/training_set/I/806.png

inflating: Dataset/training_set/I/807.png

inflating: Dataset/training_set/I/808.png

inflating: Dataset/training_set/I/809.png

inflating: Dataset/training_set/I/81.png

extracting: Dataset/training_set/I/810.png

inflating: Dataset/training_set/I/811.png

inflating: Dataset/training_set/I/812.png

inflating: Dataset/training_set/I/813.png

inflating: Dataset/training_set/I/814.png

inflating: Dataset/training_set/I/815.png

inflating: Dataset/training_set/I/816.png

inflating: Dataset/training_set/I/817.png

inflating: Dataset/training_set/I/818.png

inflating: Dataset/training_set/I/819.png

inflating: Dataset/training_set/I/82.png

inflating: Dataset/training_set/I/820.png

inflating: Dataset/training_set/I/821.png

inflating: Dataset/training_set/I/822.png

inflating: Dataset/training_set/I/823.png

inflating: Dataset/training_set/I/824.png

inflating: Dataset/training_set/I/825.png

inflating: Dataset/training_set/I/826.png

inflating: Dataset/training_set/I/827.png

inflating: Dataset/training_set/I/828.png

inflating: Dataset/training_set/I/829.png

inflating: Dataset/training_set/I/83.png

inflating: Dataset/training_set/I/830.png

inflating: Dataset/training_set/I/831.png

inflating: Dataset/training_set/I/832.png

inflating: Dataset/training_set/I/833.png

inflating: Dataset/training_set/I/834.png

inflating: Dataset/training_set/I/835.png

inflating: Dataset/training_set/I/836.png

inflating: Dataset/training_set/I/837.png

inflating: Dataset/training_set/I/838.png

inflating: Dataset/training_set/I/839.png

inflating: Dataset/training_set/I/84.png

inflating: Dataset/training_set/I/840.png

extracting: Dataset/training_set/I/841.png

inflating: Dataset/training_set/I/842.png

inflating: Dataset/training_set/I/843.png

inflating: Dataset/training_set/I/844.png

inflating: Dataset/training_set/I/845.png

inflating: Dataset/training_set/I/846.png

inflating: Dataset/training_set/I/847.png

inflating: Dataset/training_set/I/848.png

inflating: Dataset/training_set/I/849.png

inflating: Dataset/training_set/I/85.png

inflating: Dataset/training_set/I/850.png

inflating: Dataset/training_set/I/851.png

inflating: Dataset/training_set/I/852.png

inflating: Dataset/training_set/I/853.png

inflating: Dataset/training_set/I/854.png

extracting: Dataset/training_set/I/855.png

inflating: Dataset/training_set/I/856.png

inflating: Dataset/training_set/I/857.png

inflating: Dataset/training_set/I/858.png

inflating: Dataset/training_set/I/859.png

extracting: Dataset/training_set/I/86.png

inflating: Dataset/training_set/I/860.png

inflating: Dataset/training_set/I/861.png

 inflating: Dataset/training_set/I/862.png

extracting: Dataset/training_set/I/863.png

inflating: Dataset/training_set/I/864.png

inflating: Dataset/training_set/I/865.png

inflating: Dataset/training_set/I/866.png

inflating: Dataset/training_set/I/867.png

extracting: Dataset/training_set/I/868.png

inflating: Dataset/training_set/I/869.png

inflating: Dataset/training_set/I/87.png

inflating: Dataset/training_set/I/870.png

inflating: Dataset/training_set/I/871.png

inflating: Dataset/training_set/I/872.png

inflating: Dataset/training_set/I/873.png

inflating: Dataset/training_set/I/874.png

inflating: Dataset/training_set/I/875.png

inflating: Dataset/training_set/I/876.png

inflating: Dataset/training_set/I/877.png

inflating: Dataset/training_set/I/878.png

inflating: Dataset/training_set/I/879.png

inflating: Dataset/training_set/I/88.png

inflating: Dataset/training_set/I/880.png

inflating: Dataset/training_set/I/881.png

inflating: Dataset/training_set/I/882.png

inflating: Dataset/training_set/I/883.png

inflating: Dataset/training_set/I/884.png

inflating: Dataset/training_set/I/885.png

extracting: Dataset/training_set/I/886.png

extracting: Dataset/training_set/I/887.png

inflating: Dataset/training_set/I/888.png

inflating: Dataset/training_set/I/889.png

inflating: Dataset/training_set/I/89.png

inflating: Dataset/training_set/I/890.png

inflating: Dataset/training_set/I/891.png

inflating: Dataset/training_set/I/892.png

inflating: Dataset/training_set/I/893.png

inflating: Dataset/training_set/I/894.png

inflating: Dataset/training_set/I/895.png

inflating: Dataset/training_set/I/896.png

inflating: Dataset/training_set/I/897.png

inflating: Dataset/training_set/I/898.png

inflating: Dataset/training_set/I/899.png

inflating: Dataset/training_set/I/9.png

inflating: Dataset/training_set/I/90.png

inflating: Dataset/training_set/I/900.png

inflating: Dataset/training_set/I/901.png

inflating: Dataset/training_set/I/902.png

inflating: Dataset/training_set/I/903.png

inflating: Dataset/training_set/I/904.png

extracting: Dataset/training_set/I/905.png

inflating: Dataset/training_set/I/906.png

inflating: Dataset/training_set/I/907.png

inflating: Dataset/training_set/I/908.png

inflating: Dataset/training_set/I/909.png

inflating: Dataset/training_set/I/91.png

inflating: Dataset/training_set/I/910.png

extracting: Dataset/training_set/I/911.png

extracting: Dataset/training_set/I/912.png

inflating: Dataset/training_set/I/913.png

inflating: Dataset/training_set/I/914.png

extracting: Dataset/training_set/I/915.png

inflating: Dataset/training_set/I/916.png

inflating: Dataset/training_set/I/917.png

inflating: Dataset/training_set/I/918.png

inflating: Dataset/training_set/I/919.png

inflating: Dataset/training_set/I/92.png

inflating: Dataset/training_set/I/920.png

inflating: Dataset/training_set/I/921.png

inflating: Dataset/training_set/I/922.png

inflating: Dataset/training_set/I/923.png

inflating: Dataset/training_set/I/924.png

inflating: Dataset/training_set/I/925.png

inflating: Dataset/training_set/I/926.png

inflating: Dataset/training_set/I/927.png

inflating: Dataset/training_set/I/928.png

inflating: Dataset/training_set/I/929.png

inflating: Dataset/training_set/I/93.png

inflating: Dataset/training_set/I/930.png

inflating: Dataset/training_set/I/931.png

inflating: Dataset/training_set/I/932.png

inflating: Dataset/training_set/I/933.png

inflating: Dataset/training_set/I/934.png

inflating: Dataset/training_set/I/935.png

inflating: Dataset/training_set/I/936.png

inflating: Dataset/training_set/I/937.png

inflating: Dataset/training_set/I/938.png

inflating: Dataset/training_set/I/939.png

inflating: Dataset/training_set/I/94.png

inflating: Dataset/training_set/I/940.png

inflating: Dataset/training_set/I/941.png

inflating: Dataset/training_set/I/942.png

inflating: Dataset/training_set/I/943.png

inflating: Dataset/training_set/I/944.png

inflating: Dataset/training_set/I/945.png

inflating: Dataset/training_set/I/946.png

inflating: Dataset/training_set/I/947.png

inflating: Dataset/training_set/I/948.png

inflating: Dataset/training_set/I/949.png

inflating: Dataset/training_set/I/95.png

inflating: Dataset/training_set/I/950.png

inflating: Dataset/training_set/I/951.png

inflating: Dataset/training_set/I/952.png

inflating: Dataset/training_set/I/953.png

inflating: Dataset/training_set/I/954.png

inflating: Dataset/training_set/I/955.png

inflating: Dataset/training_set/I/956.png

inflating: Dataset/training_set/I/957.png

inflating: Dataset/training_set/I/958.png

inflating: Dataset/training_set/I/959.png

inflating: Dataset/training_set/I/96.png

inflating: Dataset/training_set/I/960.png

inflating: Dataset/training_set/I/961.png

inflating: Dataset/training_set/I/962.png

inflating: Dataset/training_set/I/963.png

inflating: Dataset/training_set/I/964.png

inflating: Dataset/training_set/I/965.png

inflating: Dataset/training_set/I/966.png

inflating: Dataset/training_set/I/967.png

inflating: Dataset/training_set/I/968.png

inflating: Dataset/training_set/I/969.png

inflating: Dataset/training_set/I/97.png

inflating: Dataset/training_set/I/970.png

inflating: Dataset/training_set/I/971.png

inflating: Dataset/training_set/I/972.png

extracting: Dataset/training_set/I/973.png

inflating: Dataset/training_set/I/974.png

inflating: Dataset/training_set/I/975.png

inflating: Dataset/training_set/I/976.png

inflating: Dataset/training_set/I/977.png

inflating: Dataset/training_set/I/978.png

inflating: Dataset/training_set/I/979.png

inflating: Dataset/training_set/I/98.png

inflating: Dataset/training_set/I/980.png

inflating: Dataset/training_set/I/981.png

inflating: Dataset/training_set/I/982.png

extracting: Dataset/training_set/I/983.png

inflating: Dataset/training_set/I/984.png

inflating: Dataset/training_set/I/985.png

inflating: Dataset/training_set/I/986.png

inflating: Dataset/training_set/I/987.png

inflating: Dataset/training_set/I/988.png

inflating: Dataset/training_set/I/989.png

inflating: Dataset/training_set/I/99.png

inflating: Dataset/training_set/I/990.png

inflating: Dataset/training_set/I/991.png

inflating: Dataset/training_set/I/992.png

extracting: Dataset/training_set/I/993.png

inflating: Dataset/training_set/I/994.png

inflating: Dataset/training_set/I/995.png

extracting: Dataset/training_set/I/996.png

inflating: Dataset/training_set/I/998.png

inflating: Dataset/training_set/I/999.png

DATA AUGMENTATION

from keras.preprocessing.image import ImageDataGenerator

train_datagen=ImageDataGenerator(rescale = 1./255, shear_range=0.2, zoom_range=0.2,horizontal_flip=True,vertical_flip=False)

test_datagen = ImageDataGenerator(rescale=1./255)

x_train = train_datagen.flow_from_directory("/content/Dataset/training_set", target_size=(64,64),batch_size=100,

                              class_mode='categorical', color_mode ="grayscale")

Found 15750 images belonging to 9 classes.

x_test = test_datagen.flow_from_directory("/content/Dataset/test_set", target_size=(64,64),batch_size=100,

                              class_mode='categorical', color_mode ="grayscale")

Found 2250 images belonging to 9 classes.

len(x_train)

158

len(x_test)

23

x_train.class_indices

{'A': 0, 'B': 1, 'C': 2, 'D': 3, 'E': 4, 'F': 5, 'G': 6, 'H': 7, 'I': 8}MODEL

BUILDING

from keras.models import Sequential

from keras.layers import Dense

from keras.layers import Convolution2D

from tensorflow.keras.layers import Conv2D, MaxPooling2D

```
from keras.layers import Dropout

from keras.layers import Flatten

#Creating the model

model=Sequential()

#Adding the layers

model.add(Convolution2D(32,(3,3), input_shape=(64,64,1), activation = 'relu'))

model.add(MaxPooling2D(pool_size=(2,2)))

model.add(Flatten())


#adding hidden layers

model.add(Dense(400, activation='relu'))

model.add(Dense(200, activation='relu'))

model.add(Dense(100, activation='relu'))


#Adding the output layer model.add(Dense(9,

 activation='softmax'))

model.compile(loss='categorical_crossentropy', optimizer='adam', metrics=['accuracy'])

model.fit_generator(x_train, steps_per_epoch=30, epochs=10,
validation_data=x_test,validation_steps=50)

Epoch 1/10

/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:1: UserWarning:
`Model.fit_generator` is deprecated and will be removed in a future version. Please use
`Model.fit`, which supports generators. """Entry

 point for launching an IPython kernel.

30/30 [==============================] - ETA: 0s - loss: 0.0083 - accuracy: 0.9957

WARNING:tensorflow:Your input ran out of data; interrupting training. Make sure that your dataset or
generator can generate at least `steps_per_epoch * epochs` batches (in this case, 50
```

batches). You may need to use the repeat() function when building your dataset.

30/30 [==============================] - 18s 587ms/step - loss: 0.0083 - accuracy: 0.9957 - val_loss: 0.2910 - val_accuracy: 0.9693

Epoch 2/10

30/30 [==============================] - 12s 402ms/step - loss: 0.0081 - accuracy: 0.9980

Epoch 3/10

30/30 [==============================] - 12s 400ms/step - loss: 0.0102 - accuracy: 0.9963

Epoch 4/10

30/30 [==============================] - 12s 402ms/step - loss: 0.0049 - accuracy: 0.9993

Epoch 5/10

30/30 [==============================] - 12s 402ms/step - loss: 0.0030 - accuracy: 0.9997

Epoch 6/10

30/30 [==============================] - 12s 394ms/step - loss: 0.0019 - accuracy: 0.9997

Epoch 7/10

30/30 [==============================] - 12s 401ms/step - loss: 0.0081 - accuracy: 0.9973

Epoch 8/10

30/30 [==============================] - 12s 402ms/step - loss: 0.0124 - accuracy: 0.9960

Epoch 9/10

30/30 [==============================] - 12s 401ms/step - loss: 0.0070 - accuracy: 0.9987

Epoch 10/10

30/30 [==============================] - 12s 399ms/step - loss: 0.0089 - accuracy: 0.9973

model.save('Real_time.h5')

TEST THE MODEL

from tensorflow.keras.models import load_model from

tensorflow.keras.preprocessing import imageimport

numpy as np

```
import cv2

model = load_model('/content/Real_time.h5')

img = image.load_img('/content/Dataset/test_set/H/107.png',target_size = (100,100))img


from skimage.transform import resize

def detect(frame):

    img=image.img_to_array(frame)img

    = resize(img,(64,64,1))

    img = np.expand_dims(img,axis=0) pred=np..

    argmax(model.predict(img))

    op=['A','B','C','D','E','F','G','H','I']

    print("THE PREDICTED LETTER IS ",op[pred])

img=image.load_img("/content/Dataset/test_set/H/107.png")detect(img)

1/1 [==============================] - 0s 28ms/step

THE PREDICTED LETTER IS H

img = image.load_img('/content/Dataset/test_set/A/110.png')

pred=detect(img)

1/1 [==============================] - 0s 26ms/step

THE PREDICTED LETTER IS A

img=image.load_img('/content/Dataset/test_set/E/111.png')detect(img)

1/1 [==============================] - 0s 30ms/step

THE PREDICTED LETTER IS E
```