EE871 Reg.No. : ..... Marks :

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA - SURATHKAL, SRINIVASNAGAR-PIN:575 025

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC SESSION January-May 2020

Assignement-3.2 & 3.3
(Continued from A3.1 (Q1))

Course Code	: EE871	Course Title	: **Machine Learning**
Credits	: 3-1-2 : 5	Instructor	: Dr. Jora M. Gonda
Weight	: 0.5%+1.5%	Submission Deadline	: 01-02-2020, 05:30 PM

---

1. Consider a 9x7 grid. It is intended to create a data set of different font-types for alphabets of English, by marking a cell with "#" where any character has an impression other than a blank, as shown in Figure 1 on page 2, for my(JORA) font for A_{JORA}. The coding for a character is to be done with -1 for a blank and +1 for a "#". Thus code the following characters into a data vector of length $I = 63$ (=9x7):

   A, B, C, D, E, F, J, K, M, P, R.

   Note: $i = 1$ for the left-most top-corner and $i = 63$ for the bottom-most right-corner, and read left-to-right and then top-to-bottom. Your uploads must include, the pictures of the above alphabets, and a file with listing of the codes in:
   filename=A3.1_RollNo_EE871_JMG_JAN_MAY_2020.csv, all in a zip file,
   filename=A3.1_RollNo_EE871_JMG_JAN_MAY_2020.
   Example: The code for my A is as follows:

   $\underline{x}(A_{JORA})$=($x_1(A_{JORA})$ = -1, -1, -1, +1, -1, -1,-1, -1, -1, +1, -1, +1, -1, -1,-1, +1, -1, -1, -1, +1, -1,+1, -1, -1, -1, -1, -1, +1,+1, -1, -1, -1, -1, -1, +1,+1, +1, +1, +1, +1, +1,+1,+1, -1, -1, -1, -1, -1, +1,+1, -1, -1, -1, -1, -1, +1,+1, -1, -1, -1, -1, -1, +1=$x_{63}(A_{JORA})$).

   The .odt file for creating the characters is also attached herewith for your convenience.

2. Capture the image of the characters and convert to data of any size I, (I=rows x columns). Apply a threshold and binarize the data. Then refit to 9x7. Compare the data with that you obtained in Q(1). Submit the programs and data in
   filename=A3.2_P_RollNo_EE871_JMG_JAN_MAY_2020 and
   filename=A3.2_D_RollNo_EE871_JMG_JAN_MAY_2020, where P stands for program and D for data.

3. Develop a model with single layer, multi-output ANN to do classification of any 5 alphabets (remaining (6) chosen for unknown category). Report the results for model. Submit the programs and data in
   filename=A3.3_P_RollNo_EE871_JMG_JAN_MAY_2020 where P stands for program and
   filename=A3.3_R_RollNo_EE871_JMG_JAN_MAY_2020, and R stands for report.

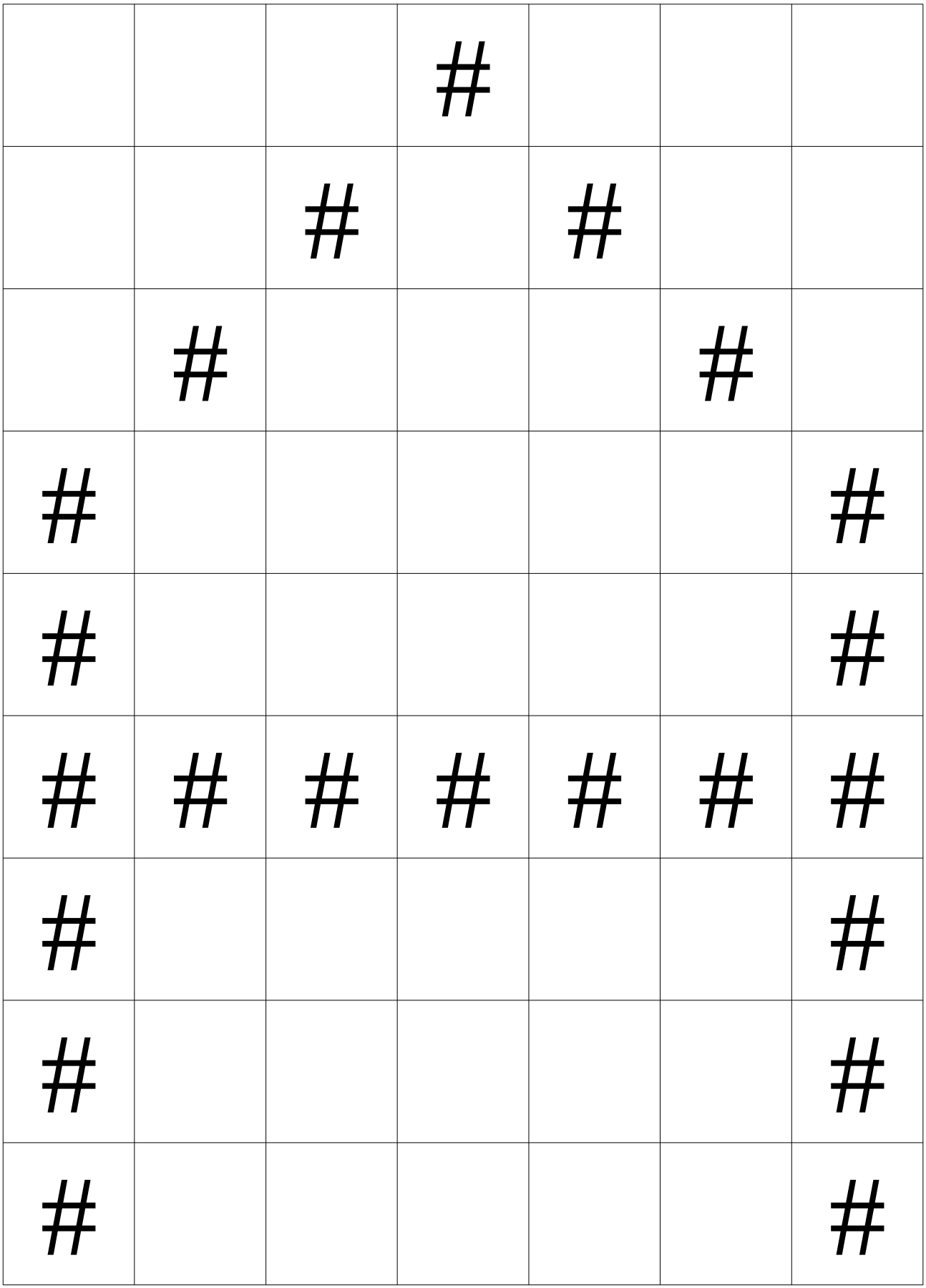

Figure 1: Picture for character ‘A’