# ML for CKD prediction

To predict CKD (Chronic Kidney Disease) we used a Kaggle dataset (<https://archive.ics.uci.edu/dataset/336/chronic+kidney+disease>) and created a predictive AI model hosted in watsonx.ai on IBM Cloud.

Input parameters for prediction are:

* **Fields** (eg: bp - blood pressure, sg - specific gravity, pc - pus cell etc.)
* **Values** for each of the field above.

Output from the predictive AI model has:

* **Prediction**: 0 means CKD is present, and 1 means absent.
* **Probability**: indicates how confident the model is about the prediction.

Procedure to get a prediction from the AI model:

* **Authentication:** First step is to get the authentication token using the API\_KEY
* **Scoring:** Second step is get the scoring (prediction) by sending the fields and values along with the auth token received in the previous step.

Below are some cURL command examples that showcase the input and the output received from the hosted CKD predictive model. The token acquired is saved in the environment variable IAM\_TOKEN.

* **2 inputs – both having CKD prediction as true**
  + **Command:** curl -X POST --header "Content-Type: application/json" --header "Accept: application/json" --header "Authorization: Bearer $IAM\_TOKEN" -d '{"input\_data": [{"fields": ["age", "blood\_pressure", "specific\_gravity", "albumin", "sugar", "red\_blood\_cells", "pus\_cell", "pus\_cell\_clumps", "bacteria", "blood\_glucose\_random", "blood\_urea", "serum\_creatinine", "sodium", "potassium", "haemoglobin", "packed\_cell\_volume", "white\_blood\_cell\_count", "red\_blood\_cell\_count", "hypertension", "diabetes\_mellitus", "coronary\_artery\_disease", "appetite", "peda\_edema", "aanemia"], "values": [["48.0", "70.0", "1.005", "4.0", "0.0", 1, 0, 1, 0, "117.0", "56.0", "3.8", "111.0", "2.5", "11.2", "32", "6700", "3.9", 1, 0, 0, 1, 1, 1], ["63.0", "70.0", "1.01", "3.0", "0.0", 0, 0, 1, 0, "380.0", "60.0", "2.7", "131.0", "4.2", "10.8", "32", "4500", "3.8", 1, 1, 0, 1, 1, 0]]}]}' <API endpoint>
  + **Result:** {"predictions":[{"fields":["prediction","probability"],"values":[[0,[0.999700956935571,0.0002990430644290014]],[0,[1.0,0.0]]]}]}
* **2 inputs – 1 CKD true and 1 CKD false**
  + **Command:** curl -X POST --header "Content-Type: application/json" --header "Accept: application/json" --header "Authorization: Bearer $IAM\_TOKEN" -d '{"input\_data": [{"fields": ["age", "blood\_pressure", "specific\_gravity", "albumin", "sugar", "red\_blood\_cells", "pus\_cell", "pus\_cell\_clumps", "bacteria", "blood\_glucose\_random", "blood\_urea", "serum\_creatinine", "sodium", "potassium", "haemoglobin", "packed\_cell\_volume", "white\_blood\_cell\_count", "red\_blood\_cell\_count", "hypertension", "diabetes\_mellitus", "coronary\_artery\_disease", "appetite", "peda\_edema", "aanemia"], "values": [["48.0", "70.0", "1.005", "4.0", "0.0", 1, 0, 1, 0, "117.0", "56.0", "3.8", "111.0", "2.5", "11.2", "32", "6700", "3.9", 1, 0, 0, 1, 1, 1], ["40.0", "80.0", "1.025", "0.0", "0.0", 1, 1, 0, 0, "140.0", "10.0", "1.2", "135.0", "5.0", "15.0", "48", "10400", "4.5", 0, 0, 0, 0, 0, 0]]}]}' <API endpoint>
  + **Result:** {"predictions":[{"fields":["prediction","probability"],"values":[[0,[0.999700956935571,0.0002990430644290014]],[1,[0.07550563595511695,0.924494364044883]]]}]}