- **Project Title:**
  Predicting the life expectancy using the Machine Learning

- **Project Summary:**
  Now-a-days most of the people are suferring from various diseases, these diseases may caused due to various reason like alcholol consumption, BP, Diabetes etc. Thus we will be developing an application using ML algorithm for the prediction of the life expectancy of such patients.

- **Project Requirements:**
  The project will help in determing the life expectancy rate on the basic of the dataset. The dataset will provide various details like kind of diseases leading to the death. thus with help of this information we will predict the life expectancy.

- **Technical Requirements:**
  We will be using:
  1)Programming language - Python
  2)Machine learning Algorithms

- **Software Requirements:**
  1)IBM cloud
  2)IBM Watson
  3)Jupyter Notebook

- **Project Deliverables:**
  The application will help out in predicting the life expectancy on the basis of the information provided and which disease have the highest life expectancy rate can be predicted through the model.

- **Project Schedule:**
  The project wil be Scheduled for one month from 16 May 2020 to 15 June 2020.

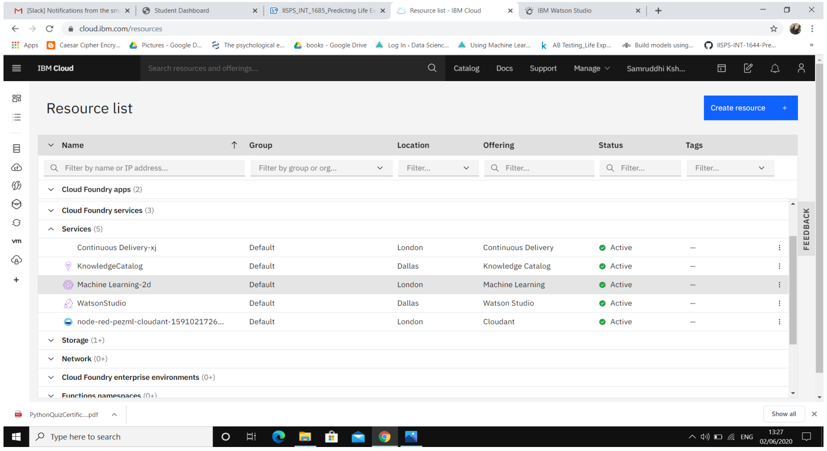
- **Phases in the Development:**

1. **Collecting the Dataset:**

   First most important thing for any project is collecting the data as per requirement of the model. Thus firstly we collect the data from the given source. For the project the dataset was "Life Expectancy".
   Thus dataset was provided by the WHO in order for the anlysis purpose. We have used this dataset for the prediction purpose.

2. **Setting up IBM Cloud Services:**

   For using the various Cloud services for the project development. One must first create an IBM Cloud account. Once the account is created you can access various services used for ML an AI projects



Resource list

Name	Group	Location	Offering	Status	Tags
Filter by name or IP address...	Filter by group or org...	Filter...	Filter...	Filter...	Filter...
Cloud Foundry apps (2)					
Cloud Foundry services (3)					
Services (5)					
Continuous Delivery-xj	Default	London	Continuous Delivery	Active	–
KnowledgeCatalog	Default	Dallas	Knowledge Catalog	Active	–
Machine Learning-2d	Default	London	Machine Learning	Active	–
WatsonStudio	Default	Dallas	Watson Studio	Active	–
node-red-pezml-cloudant-1591021726...	Default	London	Cloudant	Active	–
Storage (1+)					
Network (0+)					
Cloud Foundry enterprise environments (0+)					
Functions namespaces (0+)					

3. **Ceating a Watson Project:**

   Once the services required for the project are enabled you can go with for the creation of the project. Watson Studio allows you to create various project using different tools like Jupyter nb, Auto AI, R Studio etc.

   a) **Configure the Watson studio:**

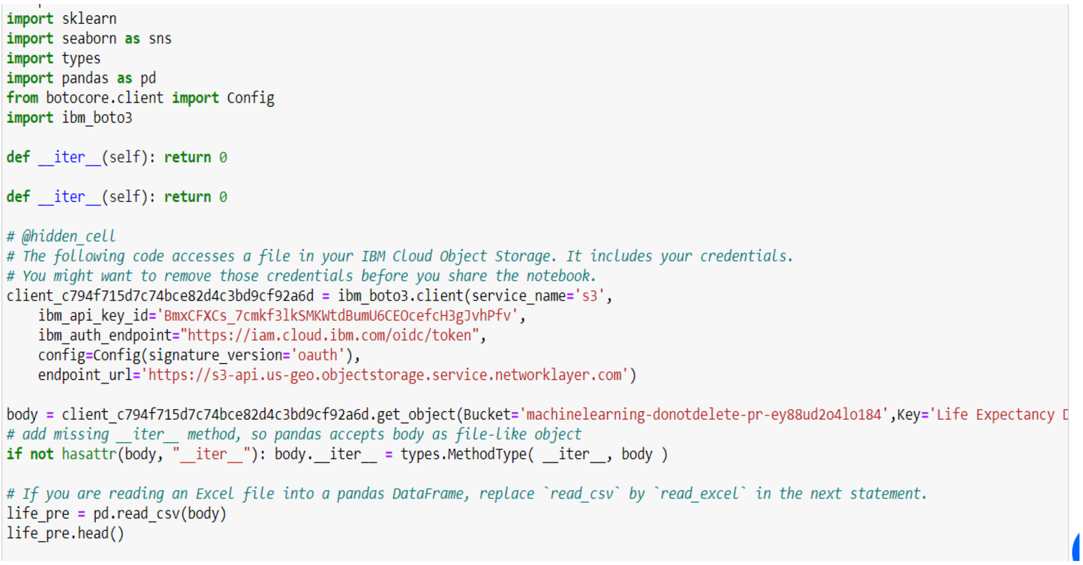
   Once you are done with the creation of the watson project you can configure the various services associated with it. Also you can look for the various tools associated with it.

4. **Creating Machine Learning Services:**

As we are creating the Machine Learning Model for the prediction of the Life Expectancy we must create the Macine learning services in IBM cloud which will help in building up the model.

a) **Create Jupyter Nb and Import Datset:**

Firstly in the project we need to add the Jupyter Nb(It is the platform for developing the model and actual implementation. Once the Jupyter nb is created we must import the data. The data set is Inserted to code In **pandas data frame**.

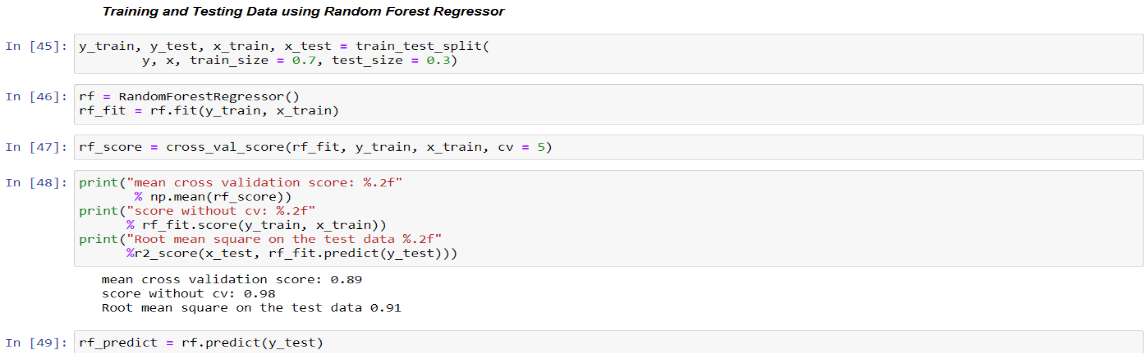


```
import sklearn
import seaborn as sns
import types
import pandas as pd
from botocore.client import Config
import ibm_boto3

def __iter__(self): return 0

def __iter__(self): return 0

# @hidden_cell
# The following code accesses a file in your IBM Cloud Object Storage. It includes your credentials.
# You might want to remove those credentials before you share the notebook.
client_c794f715d7c74bce82d4c3bd9cf92a6d = ibm_boto3.client(service_name='s3',
    ibm_api_key_id='BmxCFXCs_7cmkf3lkSMKWtdBumU6CEOcefcH3gJvhPfv',
    ibm_auth_endpoint="https://iam.cloud.ibm.com/oidc/token",
    config=Config(signature_version='oauth'),
    endpoint_url='https://s3-api.us-geo.objectstorage.service.networklayer.com')

body = client_c794f715d7c74bce82d4c3bd9cf92a6d.get_object(Bucket='machinelearning-donotdelete-pr-ey88ud2o4lo184',Key='Life Expectancy D
# add missing __iter__ method, so pandas accepts body as file-like object
if not hasattr(body, "__iter__"): body.__iter__ = types.MethodType( __iter__, body )

# If you are reading an Excel file into a pandas DataFrame, replace `read_csv` by `read_excel` in the next statement.
life_pre = pd.read_csv(body)
life_pre.head()
```

b) **Choose the appropiate model for prediction:**

We can use any model for the the prediction person and with the help of it you can train and test the dataset.

For the project I have been choosing the **Random Forest Regressor Model** for the development purpose.

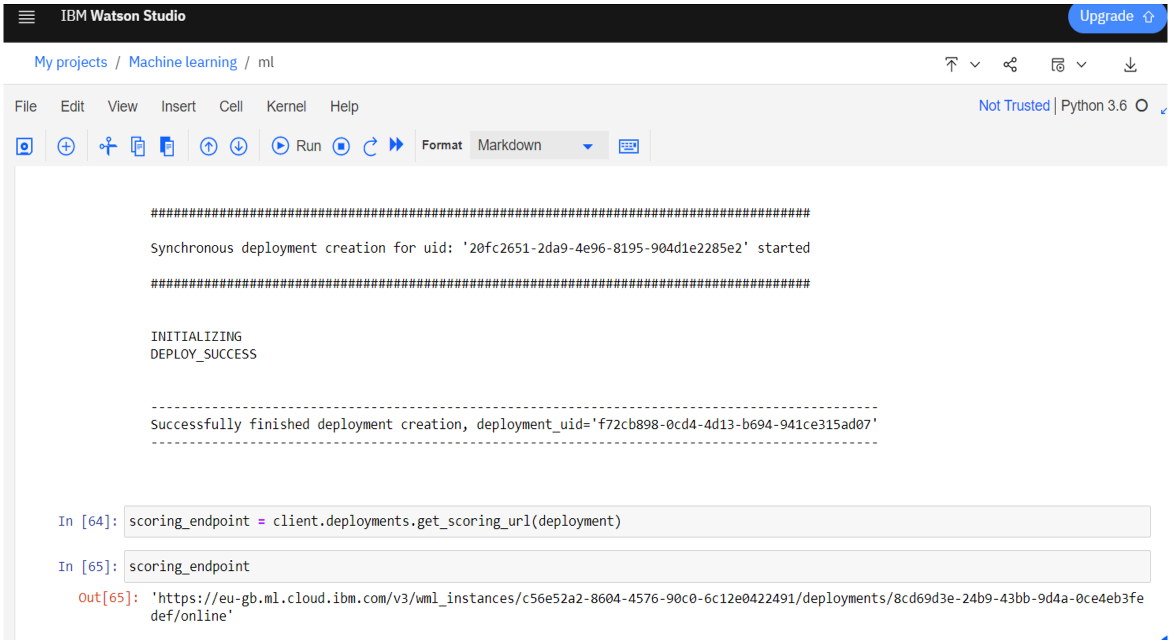


Training and Testing Data using Random Forest Regressor

```
In [45]: y_train, y_test, x_train, x_test = train_test_split(
                 y, x, train_size = 0.7, test_size = 0.3)

In [46]: rf = RandomForestRegressor()
         rf_fit = rf.fit(y_train, x_train)

In [47]: rf_score = cross_val_score(rf_fit, y_train, x_train, cv = 5)

In [48]: print("mean cross validation score: %.2f"
                % np.mean(rf_score))
         print("score without cv: %.2f"
               % rf_fit.score(y_train, x_train))
         print("Root mean square on the test data %.2f"
               %r2_score(x_test, rf_fit.predict(y_test)))

            mean cross validation score: 0.89
            score without cv: 0.98
            Root mean square on the test data 0.91

In [49]: rf_predict = rf.predict(y_test)
```

c) **Deployment of Model:**

Once you re done with building the model . You must deploy the model. The deployed model will be stored in Ibm Cloud Storage.



IBM Watson Studio
Upgrade
My projects / Machine learning / ml
File Edit View Insert Cell Kernel Help
Not Trusted | Python 3.6
Run
Format Markdown

```
########################################################################################

Synchronous deployment creation for uid: '20fc2651-2da9-4e96-8195-904d1e2285e2' started

########################################################################################


INITIALIZING
DEPLOY_SUCCESS


-------------------------------------------------------------------------------------------------
Successfully finished deployment creation, deployment_uid='f72cb898-0cd4-4d13-b694-941ce315ad07'
-------------------------------------------------------------------------------------------------


In [64]: scoring_endpoint = client.deployments.get_scoring_url(deployment)

In [65]: scoring_endpoint

Out[65]: 'https://eu-gb.ml.cloud.ibm.com/v3/wml_instances/c56e52a2-8604-4576-90c0-6c12e0422491/deployments/8cd69d3e-24b9-43bb-9d4a-0ce4eb3fe
         def/online'
```

5. **Create a Node-red Flow:**

Once the model is deployed you can create the node red flow to create an API for the model . thus API will act as an front end to the model.

- **Conclusion:**

From the project we conclude the life expectancy from thi given dataset.