Capstone Project Ideas

Project 1:

Problem Statement:

FDA regulated medical device industry has faced revenue and profitability challenges. The result has been a search for new revenue and profitability, which has included looking for new sources of profit.

* **Increased clinical and regulatory standards increase overhead**
* **Increasing R&D expenses**
* **Reductions in reimbursements**
* **Increased complexity of medical equipment/devices**
* **More demanding and diverse customer base**
* **Increased competition**
* **Migration of some testing to home based tests (vs. labs)**

Predict: - Establish a relation for total lifecycle of a product . Predict FDA PMA Approval for Class III Devices. How the Pre-Market Approval time has changed over time. How the competition has increased over time. Which is the most profitable division that manufacturers can invest to get Maximum ROI.

Data Description: -

PMA data: The Medical Device Amendments of 1976 to the Federal Food, Drug, and Cosmetic Act (the act) established three regulatory classes for medical devices. The three classes are based on the degree of control necessary to assure that the various types of devices are safe and effective. The most regulated devices are in Class III.PMA Approval Data set can be found [here](https://www.fda.gov/medicaldevices/productsandmedicalprocedures/deviceapprovalsandclearances/pmaapprovals/default.htm#resources) .

Product Classification : Product classification data can be found [here](https://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/Overview/ClassifyYourDevice/ucm051668.htm#medicalspecialty).

Post Approval Study: The FDA has the authority to require sponsors to perform a post-approval study (or studies) at the time of approval of a premarket approval (PMA), humanitarian device exemption (HDE), or product development protocol (PDP) application. Post-approval studies can provide patients, health care professionals, the device industry, the FDA and other stakeholders information on the continued safety and effectiveness (or continued probable benefit, in the case of an HDE) of approved medical devices

Post Approval study data can be found [here](https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpma/pma_pas.cfm?s=t).

Device Recall Data: Device recall data can be found [here](https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfRES/res.cfm?start_search=1&event_id=&productdescriptiontxt=&productcode=&IVDProducts=&rootCauseText=&recallstatus=&centerclassificationtypetext=&recallnumber=&postdatefrom=11%2F01%2F2002&postdateto=10%2F09%2F2018&productshortreasontxt=&firmlegalnam=&PMA_510K_Num=&pnumber=&knumber=&PAGENUM=500).

MADUE: Manufacture and user facility device experience data can be found [here](https://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/PostmarketRequirements/ReportingAdverseEvents/ucm127891.htm).

Project 2

Diabetes Data set: Using classification and regression Predict outcome of diabetes.

<https://github.com/susanli2016/Machine-Learning-with-Python/blob/master/diabetes.csv>

Project 3:

Tennis : <https://www.kaggle.com/ryanthomasallen/tennis-match-charting-project>

Predict who will win a match.

 increase of tennis Grand Slam champions along with time