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About me :
I am a Computer Science major in my junior year. My prime interests lies in using programming as a tool in diverse streams, Astronomy being one of them. All my projects so far have been from different engineering and science streams.
Few of them are :
1.**Braille printer** using Arduino and Python (description in my Github)
2.File Upload and Data Analysis using **Flask** (description in my Github)
3.Android Apps on Play Store, one being utilized heavily in Energy Modeling of Buildings
4.Breast Cancer tumor **classification** applying **Machine Learning** Algorithms
5.Research Work in **Number Theor**y (precisely in the field of Number Theoretic Functions)
6.Research Work in **Data Mining** (developing a novel FP mining algorithm using Closed Frequent Itemsets)
7.Research Work in **Graph Theory** (in field of sparse matrices and their exponent)
8.Facial Recognition using Signal Processing and Matlab
9.Various projects on Web Scraping , Twitter API, Telegram APIs (description in my Github)
10.Assisted my College **Hyperloop team** , for SpaceX competition in pod design and simulations.
11.Open Source contributions in **Pandas and Sympy**. With one API change integrated in latest version of Pandas (v18.0) :- issue-11833

Some of the projects have utilized scientific data. For instance the android app I developed for energy/material modeling was based on **thermodynamic datasets**. It used **EPF** and **U-value** calculators to design building structure in an eco-friendly and energy efficient manner. It has various widgets like **sliders, drop-downs** etc. making it user friendly and can be effectively used even by a layman.
Link to the app -: ECBC-APP .
Another project which used scientific data was Breast Cancer tumor Classification. The dataset used was from a UCI machine learning repository. Python's **Matplotlib** library was used to plot the data, Pandas was used for data analysis .Numerous interactive **graphs and sub plots, 3D** plots etc. were created showing tumor classification (malignant/benign) with various features like radius,color,and texture etc.They could have been of immense benefit for cancer scientists, who could analyze tumor trends by looking at the interactive plots. Source code link :-Breast Cancer Tumor Classification
These two projects have **modeled complex scientific data into a presentable and interactive UI.** This kind of work would be required in NanoGrav project, in which primary scientific and diagnostic data has to be plotted. Most of the Math/Data Mining projects which I have done have all been research initiatives under distinguished professors. Thus I have prior research experience to contribute in a scientific research observatory.

Courses and Skills : Numerical Analysis, Abstract Algebra, Algorithms, Number Theory ,Linear Algebra, Calculus, Classical Mechanics, Electromagnetism, Python ,Flask, Rest APIs, Android, Machine Learning, Data Mining,Java,JavaScript,C and Git .

Project Chosen :
Gravitational Waves Pulsars and NANOGrav
Reason for Choosing :I am a learning enthusiast, Astronomy/Astrophysics being my favorite disciplines. Having grown up watching Walter Lewin lectures, they got me into Physics in general and Astrophysics in

particular. Later on, fields like machine learning and guys like Jake Vanderplas motivated me enough to use programming as a tool in astronomy and natural sciences.Also,I have worked before on scientific datasets and data visualization, so I would not have to start from the scratch

Since the project requires minimal knowledge of Astronomy, this makes it even more interesting.The learning curve is steep and the scope of learning about celestial objects like Pulsars makes it very captivating.I hope to gain some insight in the field of space research and observation during summers.I would definitely be acquiring decent web-data visualization skills after working on a big project like this,with large datasets.Modern cutting edge technology like NANOGrav is involved in this project, which is used to understand the still mysterious gravitational waves.Thus the **prospect of making a scientific discovery** takes motivation to an altogether different dimension.
I would love to experience overall research atmosphere while spending my summers in McGill Space Institute.

The McGill Space Institute is my first choice,as it is a **Research Observatory** working in astronomy/astrophysics. The work thus would not be confined to mere coding and testing. It is the research and the **personal mentor-ship t**hat excites me.I intend on doing an **MS i**n Computer Science after my undergraduate and a research internship like this under close scrutiny of leading scientists would definitely aid my plans for graduate studies. Collaborating with scientists on a personal basis would provide first hand research experience. Working on scientific big data and designing user friendly interfaces would be an excellent programming opportunity.

I would be delighted to come over to Montreal for the summers. The idea of having fun summers in a different nation definitely adds to my reasons for choosing McGill Space Institute

The links for the exercise :
1.plot1 (same as previous one)
2.plot2(has three different variation in plotting)
3.plot3(must see this one)

You have to download the html files and open it in your local browser.

Operational procedure for the NanoGrav project:
1.My main language would be Python and I will heavily be using interactive plotting library **Bokeh** and scientific libraries like Scipy,Numpy etc. For data analysis **Pandas** will be used.
2.If need arises Python's astronomy modules like **astropy** can also used..
3.WebGL(a javascript API) can used when data set is very large, for fast visualization of the data.
4.For the work like model-fitting suitable tools like PyModelFit will be used.