Report 1

Answers to the questions:

**Q 1. Download the dataset. Make sure that you are able to read dataframe with subject descriptions. If you want to work with images, make sure you can read MRI scans presented in NIfTI format.**

A1: For IP and CV, I downloaded two different files OAS2\_RAW\_PART1.tar.gz (10GB) and OAS2\_RAW\_PART2.tar.gz (8GB). I will work with these files at free time. I also downloaded the main file “Demographic Data” (oasis\_longitudinal\_demographics.xlsx). The contents of the file are readable (read the details from given paper) and understandable.

**Q2. What is the target variable in the dataset? What is the meaning of CDR score?**

A2. After reading the paper, I understand that Clinical Dementia Rating (CDR) is the target variable which helps to characterize Alzheimer disease. The CDR score rate the level of disease. CDR = 0 means no dementia, CDR > 0 stands for different disease stages with different values such as CDR = 0.5 stands for early stage or very mild, CDR = 1 means mild, CDR = 2 means moderate and CDR = 3 represents severe dementia.

**Q3. Propose the hypothesis about the subject features that, in your opinion, can be connected with the further progress of AD disease. Explain your suggestions.**

A3. Comparing the values of CDR with other variables, I think that different CDR score depends on the normalized whole brain volume (nWBV) which has an inverse relation with ages. Figure 1 shows that CDR varies with the values of nWBV.

Figure 1. Realtion between CDR and nWBV

**Q 4. Propose the similar hypothesis about possible features that can be extracted from MRI scans.**

A4. MRI scan helps to measure nWBV which declines significantly for the AD group than for the nondemented group. There are many methods proposed to extract features from MRI scan [1- 3].

References

[1] Joshi, Jayashri & Phadke, Anuradha. (2010). Feature Extraction and Texture Classification in MRI. Proc Int Conf Comput Technol. 2.

[2] Udomhunsakul, S. & Wongsita, P.. (2005). Feature extraction in medical MRI images. 340 - 344 vol.1. 10.1109/ICCIS.2004.1460437.

[3] Velthuizen RP, Hall LO, Clarke LP. Feature extraction for MRI segmentation. J Neuroimaging 1999;9:85–90