ASSIGNMENT 2

The purpose of this assignment is to write a program to extract partition information from a disk image that follows a certain standard. In class, we looked at the MBR specification and how it encodes information about disks and partitions. For this assignment you will have to read the documented specification for the GUID Partition Table (GPT) standard (which is slowly replacing the traditional MBR format); use the Wikipedia link (*https://en.wikipedia.org/wiki/GUID_Partition_Table*) since it contains all the information needed to complete this assignment.

Description

Write a C/C++ program called **GPTInfo** that reads an acquired disk image file to perform the following tasks.

1) Verify that the GPT signature is present; if not present, your program should display an error message and exit.

2) Print the disk GUID in hex notation.

3) LBA addresses for the following:
   a) first usable LBA for user partitions
   b) last usable LBA for user partitions
   c) starting LBA where partition entries begin

4) Number of partition entries.

5) Size of each partition entry.

Then for each partition, it should print the following information.

6) The partition type GUID (make sure you print it in the proper `XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX` format). You may want to check your printed result with the GUIDs listed in the Wikipedia link; it should match one of them.

7) First and last LBA addresses of the partition.

8) Attribute flags in hex notation.

9) The name of the partition.

Unless otherwise specified, all numeric values should be printed in the decimal format followed by hex notation. Make sure there is proper byte-level padding when printing hex values. E.g. the decimal number 10 should be printed as `10 (0x0A)` and decimal number 320 should be printed as `320 (0x0140)`. When reading the specification, pay attention to how values are stored (its usually little endian unless stated).

Do not attempt to read the entire disk image file to a memory array. Acquired disk images can easily be multiple gigabytes in size.

You **must** fully comment your program.

Sample disk image

The beginning few sectors of a GPT formatted disk image is provided in the assignment page for you to test with.

Submission

Upload your *GPTInfo.cpp* (or *.c*) file to Canvas.

Grading

The assignment is worth **50 points** (5 pts. will be for code readability, and remaining points will be divided between the various tasks and subtasks). A program that does not compile is a program that you did not submit at all. Remember the GTA is not required to debug your program to give you partial points.

The late policy is available in the course syllabus. **You must work alone on this assignment.**