Homework 13

Problem 1

TA wrote a simple program and there is a call to function ***printf*** which is from a shared library. And after using gdb, TA found that the start address of **_GLOBAL_OFFSET_TABLE_** is **0x804a000**. And the partial .PLT(Procedure Linkage Table) after linking is:

```
080482f0 <printf@plt>:
    80482f0:    ff 25 0c a0 04 08       jmp    *0x804a00c
    80482f6:    68 00 00 00 00          push   $0x0
    80482fb:    e9 e0 ff ff ff          jmp    80482e0 <_init+0x30>
```

1) What is the value stored in the address **0x804a00c before** first calling the printf() function? (NOTE: resolved as a 32-bit hexadecimal)

2) What is the index of printf() in _GLOBAL_OFFSET_TABLE_? (NTOE: The index starts from 0)

Problem 2

Express the difference between the procedure of static link and the procedure of dynamic link (with shared library). You can draw a picture to show that.

Problem 3

1. Draw a Linux run-time memory image to show the location of GOT, PLT and shared library.
2. Express the function of PLT and GOT. And how to use them?
3. When the GOT is generated, and when the items of it are relocated?(Two situations: PIC Data References and PIC Function Calls)