

E85: Digital Design and Computer Engineering

Problem Set 7

1) *Pointers

In the following code, suppose the g array is stored in memory starting at address 0x00001000. What is the value of sp?

```
typedef struct grades {
    char name[64];
    unsigned long id;
    float scores[11];
} grades;

grades g[60]; // grades for class

float *sp = &g[7].scores[3];
```

2) Datasheets

Write a snippet of C code to set the UART peripheral to a target baud rate of 250 kHz given a TileLink bus clock (tlclk) frequency of 16 MHz using a direct write to the appropriate memory-mapped register (div) with a pointer named UART0_DIV.

3) Impact on Society: Pick a sector such as consumer appliances, automotive, aviation, toys, military, etc. Write a thoughtful and evidence-based paragraph about how the availability of inexpensive microcontrollers has transformed the design of products in your sector.

4) AI Question (Optional)

This question must be solved by AI. Report what the AI produces, whether you believe it is accurate or a hallucination, and whether the solution is similar, better, or worse than what you would have done yourself in a reasonable amount of time.

Write a C program to blink an LED on the RED-V Thing Plus board.

How long did you spend on this problem set? This will not count toward your grade but will help calibrate the workload.