Answer these questions.

1.1.) **Why did the programmer use hexadecimal literals instead of decimal literals in the**

**PORTD assignments? (Hint: hex is not necessary.)**

Because is shorted and easy to read and follow the code. otherwise you would have need it

16 digits to rapresent the same address

**1.2) Why did the programmer use 4 hexadecimal digits when the three leftmost digits**

**are 0 and are not needed? Hint: it is for a style reason and has to do with the size of**

**PORTD, which is 16 bits.**

to make sure that all data is 16 bit wide.

**1.3) Look at the MIPS code for this program. Near the top of the listing you will find**

**the assignment statement PORTD = 0x0000. What 2 MIPS instructions are used to**

**implement this assignment statement?**

1.4) According to the data sheet for this microcontroller, PORTD is located at address

0xbf8860d0. Observing that the MIPS instructions are using indexed addressing, verify

that 0 is being written to this address. Hint: Compute the address that the value 0 is

being written to. Hint 2: The assembly listing has both positive and negative decimal

literals. You will need to determine the bit pattern for a 2’s complement integer.

1.5) The width of the 1 output pulse is equal to 74 instructions. These instructions occur

starting with the C function call at line 70 and continue to the end of the C statement at

line 72, and it includes the time it takes for the delay() function to execute. Verify this

value in the next 5 parts.

1.5a) Look at the disassembly window for the delay() function. How many MIPS

instructions are before the loop?

1.5b) How many MIPS instructions are inside the loop?

1.5c) How many MIPS instructions are after the loop?

1.5d) Given that the loop executes 10 times, how many instructions are executed in

the call to the delay function?

1.5e) Why is this number less than the width of the 1 pulse (what other MIPS

instructions are done after the pins are set to 1 and before they are reset to 0?

2.1) **What was the effect of the assignment PORTD = 0x000a?**

the effect is that it sent a 1010 which is equivilent to 10 that is a

**2.2) What was the effect of the assignment PORTD = 0x0005?**

**2.3) What was the effect of the assignment PORTD = 0x0000?**

It turns of the light

2.4) How does an assignment to PORTD affect the bits in PORTD?