

ICS 233 – Spring 2010

Computer Architecture and Assembly Language

Programming Assignment 1

Problem 1: Searching and Deleting Characters from a String

Write a MIPS assembly language program to do the following:

Read a string and store it in memory. Limit the string length to 100 characters. Then, ask the user to enter a character. Search and delete every occurrence of the character in the string. The search is not case sensitive. Lowercase and uppercase letters should be equal. Display the modified string after deleting all occurrences of the input character. The following is an example:

```
Enter a string of at most 100 characters: MIPS programming is nice
Enter character to delete: i
Modified string: MPS programmng s nce
Repeat (Y/N)? n
```

Problem 2: Greatest Common Divisor (GCD)

The greatest common divisor of two integers is the largest integer that will evenly divide both integers. The GCD algorithm involves integer division in a loop, described by the following code:

```
int GCD(int x, int y) {
    x = abs(x);          // absolute value
    y = abs(y);
    do {
        int n = x % y;   // n = remainder of dividing x by y
        x = y;
        y = n;
    } while (y > 0);
    return x;
}
```

Write a MIPS assembly language program that does the following:

Ask the user to enter two integers x and y , compute and display the GCD, then ask the user whether he wants to repeat the program. Use the **divu** instruction to do the unsigned division and the **mfhi** instruction to move the remainder of the division to a general-purpose register.

Submission Guidelines:

All submissions will be done through WebCT. Submit the source code of the program. Make sure that your program is well documented.

Late Policy:

The programming assignment should be submitted on the due date by midnight. Late submissions are accepted for a maximum of 3 late days, but will be penalized. Assignments submitted after 3 late days will not be accepted.