Computer Science 122 – Computer Architecture & Assembly Language

Programming Project 3 – Assembly Language Programming

Due 2/4/21

Please complete the following problems from the textbook. Save each assembly language program as a Pep/9 Source Code (.pep) file. The name of each file should identify the textbook chapter and problem number. For example, if the program is a solution to problem 20 in Chapter 5, the Source Code file should be named **Problem5-20.pep**. When you have completed all problems, please ZIP all of your Source Code files into one ZIP file and upload this file to Canvas.

Section 5.1 (1 point)

20. Write a Pep/9 assembly language program that prints your first name on the screen. Use the `.ASCII` pseudo-op to store the characters at the bottom of your program. Use the `LDBA` instruction with direct addressing to output the characters from the string. The name your program prints must contain more than two letters.

Section 5.2 (1 point)

21. Write a Pep/9 assembly language program that prints your first name on the screen. Use immediate addressing with a character constant (a single character value) to designate the operand of `LDBA` for each letter of your name. For example, the character constant for a lower case B is specified as `'b'`. The name your program prints must contain more than two letters.

Section 5.4 (2 points each)

24. Write a Pep/9 assembly language program that corresponds to the following C program:

```
int num1;
int num2;

int main () {
     scanf("%d %d", &num1, &num2);
     printf("%d\n%d\n", num2, num1);
     return 0;
}
```

27. Write a Pep/9 assembly language program that corresponds to the following C program:

```
int width;
int length;
int perim;

int main () {
     scanf("%d %d", &width, &length);
     perim = (width + length) * 2;
     printf("width = %d\n", width);
     printf("length = %d\n\n", length);
     printf("perim = %d\n", perim);
     return 0;
}
```

28. Write a Pep/9 assembly language program that corresponds to the following C program:

```
char ch;

int main () {
     scanf("%c", &ch);
     ch--;
     printf("%c\n", ch);
     return 0;
}
```

29. Write a Pep/9 assembly language program that corresponds to the following C program:

```
int num1;
int num2;

int main () {
     scanf("%d", &num1);
     num2 = -num1;
     printf("num1 = %d\n", num1);
     printf("num2 = %d\n", num2);
     return 0;
}
```