THE UNIVERSITY OF WAIKATO
Department of Computer Science

COMP201Y — Computer Systems
Exercise 3 Test — 10th May 2004

Worth 10% — Marked out of: 30

Time allowed: 45 Min

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1. Convert the number -137.6875 to 32 bit IEEE-754 floating point format. The format for a 32 bit IEEE-754 floating point number is given in Figure 1. Show all working.

   (5 marks)

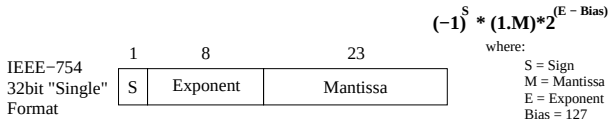

Figure 1: 32bit IEEE-754 floating point format

2. You are required to write a function `printbcd`, in WRAMP assembler. This function should accept a 32 bit packed BCD number passed on the stack according to WRAMP conventions and print it to the terminal. The routine should print the digits stored from left to right and omit leading zeroes. A second parameter complement number passed on the stack indicate the sign of the number. If the LSB of this word is 0 the number is positive and if it is 1 the number is negative.

   You may assume the existence of a routine `putchar` which accepts an ASCII character value passed on the stack and prints it to the terminal.

   You should liberally comment your code as marks can be obtained for demonstrating appropriate process even if your WRAMP code is not correct.

   (25 marks)

The following table of ASCII codes may be useful:

Decimal	Octal	Hex	Binary	Character
043	053	02B	00101011	+ (plus)
044	054	02C	00101100	, (comma)
045	055	02D	00101101	- (minus or dash)
046	056	02E	00101110	. (dot)
048	060	030	00110000	0
049	061	031	00110001	1
050	062	032	00110010	2
051	063	033	00110011	3
052	064	034	00110100	4
053	065	035	00110101	5
054	066	036	00110110	6
055	067	037	00110111	7
056	070	038	00111000	8
057	071	039	00111001	9

Department of Computer Science
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Exercise 3 Test 2004
Answer Sheet

If you need more space than is provided, write on the reverse of the page and clearly indicate this.

Name: ID Number:

1. Convert -137.6875 to a 32 bit IEEE-754 floating point value. Show all working.

(5 marks)

2. Write the `printbcd` function to print BCD numbers in the following space.

(25 marks)

```
.global printbcd
.text
printbcd:
```

If you require more space, continue overleaf and clearly indicate that you have done so.