



**2. Aufgabe 3-4** (Buch Seite 63)

itoa welches auch mit Maximalwerten funktioniert.

*"In a two's complement number representation, our version of itoa does not handle the largest negative number, that is, the value of  $n$  equal to  $-(2^{\text{wordsize}-1})$ . Explain why not. Modify it to print that value correctly, regardless of the machine on which it runs."*

**3. htoi** (Buch Aufgabe 2-3 Seite 46) \*

*"Write a function htoi(s), which converts a string of hexadecimal digits (including an optional 0x or 0X) into its equivalent integer value. The allowable digits are 0 through 9, a through f, and A through F."*

Verwenden Sie nur while Schleifen!

Hinweis: Zum Einlesen einer Zeichenkette können Sie folgendes Code-Konstrukt verwenden:

```
char str[100];
printf("Wert als HEX (z.B -0xA5D): ");
scanf("%s", str);
```

```
#include <stdio.h>
#include <string.h>

void main(void)
{
    char str[100];
    printf("\n");
    printf(" Character to Integer Convertor\n");
    printf(" =====\n");
    printf(" Type a hexadecimal value (e.g. -0xA5D): ");
    scanf("%s", str);
    printf("\n Result: %s = %i\n ", str, hexToInt(str));
    getchar(); getchar();
}

// Converts a hexadecimal string to integer
int hexToInt(char str[])
{
    int strLen, index, base, sign, returnvalue;

    strLen = strlen(str);
    index = 0;
    base = 1;
    returnvalue = 0;

    // set sign flag
    if(str[0]=='+')
    {
        sign = 1;
        index++;
    }
    else if(str[0]=='-')
    {
        sign = -1;
        index++;
    }

    while(index < strLen)
    {
        // do only accept strings with preamble 0x or 0X as valid hex values
        if(str[index]=='0' && (str[index+1]=='x' || str[index+1]=='X'))
        {
            index += 2; // Cut off the first two signs (0x or 0X)
        }

        // get the hexadecimal value of each character
        // refer to the ASCII table (e.g. http://www.asciitable.com/)
        if(str[index]>='0' && str[index]<='9')
        {
            returnvalue += base * (str[index]-48);
        }
    }
}
```

```
    }
    else if(str[index]>='a' && str[index]<='f')
    {
        returnvalue += base * (str[index]-87);
    }
    else if(str[index]>='A' && str[index]<='F')
    {
        returnvalue += base * (str[index]-55);
    }

    // multiplying the base for the next value
    base *= 16;
    index++;
}
return returnvalue * sign;
}
```

