UNIVERSITÄT DUISBURG ESSEN

NES Networked Embedded Systems

Programming in C/C++

Exercises 2

1. Given are the following source files:

```
/* scope1.c */
#include <stdio.h>

int globalvar = 1;

int main() {
  modtest();
  printf("globalvar = %d\n", globalvar);
}

/* scope2.c */
float globalvar;

void modtest(void) {
  globalvar = 2;
}
```

What output do you expect? Compile and link these files to a single executable and run. What's the actual output? Why?
Look into the man page of the linker "ld". Is there any method to prevent this or at least get notified? Try it! Hint: gcc's "-Wl,<option>" parameter is used to pass linker options through gcc to ld (spaces are replaced by ",").
(report only, 10pts)

2. Read and understand the "right-left rule" http://ieng9.ucsd.edu/~cs30x/rt_lt.rule.html
What's x in the following declarations?
int (*x[])(int, int)
int *(*x(int*))()
int *(*(*x())[])(int)
int (*x)(int *(*)(int))
(report only, 20pts)

3. Write a calculator that accepts three command line (!) arguments "<int> <op> <int>" (note the separation by spaces). You can convert the <int> parts using atoi() without further error checks. The operations should be implemented as functions and be called via a function pointer using a jump table. Do not use a switch statement or similar to convert the operator to a table index! (Hint: Look into string.h for a suitable function).
(code 50pts, comments 20pts, no report)