Cast It Away

1. Objectives

You will write a few C functions that convert different numerical data types into each other.

2. Details

We learned how a type-cast operation between two different numerical data types is conducted. By far, we've been using the C type-cast operators without deep consideration of their internal mechanisms. This may lead to unintentional and hard-to-debug programming errors. So, you are supposed to program a few type-cast operators in order to fully comprehend the type-cast operation mechanisms to the core.

The type-cast functions you have to code are as follows:

```
int float-to-int(float src);
int double-to-int(double src);
float int-to-float(int src);
double float-to-double(float src);
float double-to-float(double src);
```

Your functions are supposed to return the same results that the explicit type cast operators provided by *gcc*.

In addition to these functions, you should write a simple test program that can show the correctness of your program by comparing the results from your functions with the ones from the explicit type cast operators. The test program must be compiled easily by using the "*make*" command.

In this assignment, you can't use any type-cast operators even when they are used implicitly. However, using bit-wise operators is encouraged.

Use the *memcpy* function when you copy a bit sequence stored in a variable to the other since the use of the assignment operator in the four type-cast functions is also prohibited.

Each function should be saved in a separate C file. The file name should be the acronym of the contained function. For example, the function *float-to-int* must be saved in the file named "*fti.c*". You can provide a header file for the type-cast functions.

Finally, you will write a brief report that explains your implementation.

3. Logistics

A. Make sure that you have included your name and ID in the header comment of your code.

B. All relevant files must be zipped into a file. The zipped file name must be "studentid.c" (e.g. 2016310123.zip)

C. The report should be in the PDF format and included in the zip file. The document file name should be "studentid.pdf" (e.g. 2012310123.pdf)

D. Submit the zipped files via i-Campus by the due date.