# CTEC 2902 Code Review Form

The following exercise accounts for 10% of the marks for the second half of CTEC2902. The deadline is the same as the final project deadline – 23:59:59 on the 3rd May.

## 1: Clean Code

Take one piece of code that you think is a *good example of clean code* from any of the code bases of the team projects in the CTEC 2902 organisation GitHub (note, you may need to switch from the main branches to development branches to find the code). This does NOT include the code for the labs.

The code should be as clean as possible, but also be code that does something complicated / significant. (It’s really easy to keep simple code that’s not doing very much clean). You can pick one or more methods, or a whole class, or even a couple of classes that interact with each other.

It can be your own code, or someone else’s. Keep the creator anonymous, though – it doesn’t matter who wrote it, just that you think it’s clean, and can explain why.

Paste the code into the box below (don’t worry if it scrolls onto the next page or three):

|  |
| --- |
| public ActionResult Index(string sortOrder) {  ViewBag.CurrentSort = sortOrder;  ViewBag.NameSortParm = string.IsNullOrEmpty(sortOrder) ? "name\_desc" : "";  ViewBag.NumSortParm = sortOrder == "Num" ? "num\_desc" : "Num";  var students = from s in db.Films  select s;  switch (sortOrder)  case "name\_desc":  students = students.OrderByDescending(f => f.Movie);  break;  case "Num":  students = students.OrderBy(s => s.Rating);  break;  case "num\_desc":  students = students.OrderByDescending(s => s.Rating);  break;  default:  students = students.OrderBy(f => f.Movie);  break;  var films = db.Films.Include(f => f.Actor).Include(f => f.Director).Include(f => f.Genre);  return View(students.ToPagedList(pageNumber, pageSize));  } |

Now explain in no more than one side of A4 (at the very most) why you think it’s a good piece of clean code. (You may need to refer to the *List of Code Smells* at the end of this document for more ideas about clean versus smelly code).

This code function allows the user to sort the films or genres. There are however code smells such as there are no comments on this function. This is a problem because developers won’t know the code does or what it’s for. Furthermore, in the code not appropriate names have been chosen such as, the code is in films controller however uses a student as a variable. This is a problem for developers because they may get confused because of the wrong choice of naming conventions.

Furthermore, the code uses a switch statement where it behaves more than one way such as it uses switch statement for Name\_desc, and Num\_desc. Moreover, helper methods are not close to the code, this is a problem because the developers would then have to look for it.

This shows that this part of code is not a clean code for number of reasons. The code needs to have comments and the names of the variables have to have a meaning related to the system. It also need to have a proper switch statement and a helper method. This would in return make the job of the developer easier.

## (Abbreviated) list of code smells

These example *code smells* come from Clean Code by Robert C. Martin (Chapter 17), which you were pointed at (along with a lot of free resources provided by the author) during the very first lecture. If you want an example of some classic *dirty code*, check out the method I wrote for the start of week 26’s lab.

### Comment smells

1. A comment contains inappropriate or misleading information.
2. A comment is out of date and no longer matches the code.
3. A comment is redundant: i.e. it just describes something obvious that the code is clearly doing.
4. Commented out code has been left in the codebase.

### Method smells

1. A method has a large number of parameters, so that it’s hard to be clear what they all do.
2. The method isn’t called by any other method (i.e. it’s a dead method that’s still in the code when it doesn’t do anything).
3. One of the parameters is a *Boolean flag* or *switch*, which is passed in to make the method behave in more than one way. (Instead of a switch like this, you should have two methods that only do one thing, and put the switching logic at the point you call them).
4. Method too large: as a rule of thumb, a method you have to scroll through for a page or three is too long. It probably does too much, and needs breaking down into helper methods.

### General code smells

1. Duplicate code: a large chunk of code has been copied and pasted, and runs twice. (Week 26’s lab has a great example of this).
2. Dead code: chunks of code that don’t even get executed – e.g. an if statement for a condition that can’t ever happen, or a switch for a case that will never occur.
3. Vertical separation: helper methods should be close to the point in the code where they are called. You shouldn’t have to scroll several pages up or down to find them.
4. Misplaced responsibility: functionality should go in the place it makes most sense to put it. E.g. a “calculateOrderTotal()” method should go in an Order class, not in the OrdersController (see week 26 again).
5. Don’t use ‘magic numbers’. If you need to calculate VAT, set a constant VAT variable and set it to .2, rather than multiplying totals by .2 (with no real explanation why). Even better, set the VAT\_RATE as a variable in the app / web.config file so you can change it without rebuilding the whole application.
6. Code defensively: if a method needs a property to be set before it will run, check the variable is set, and if it isn’t throw an IllegalOperationException.
7. And while we’re talking about Exceptions, you have wrapped code that could fail (e.g. calls to a database that might go offline) in try / catch blocks, haven’t you?

### Variable Naming Smells

1. Make names descriptive. So ‘VATRate’ rather than ‘vr’.
2. Use standard names and stick to them. A good example from MVC is the ‘Create, Edit, Details, Delete’ standard: don’t rename these ‘Make, Change, Read, Kill’.
3. Make names unambiguous. So if you have a function for renaming an image file, call it ‘renameImageFile(string pathToFile)’ rather than ‘rename(string path)’.
4. The longer the variable is in scope for, the clearer its name should be: so if you name a loop counter ‘i’, but it’s only used on three lines then never referred to again, that’s fine. But calling a variable with class scope ‘i’, and then referring to it constantly throughout 750 lines of code is NOT fine.
5. Don’t use Hungarian notation. E.g. don’t call classes ‘clsMovie’. (MVC will break, for a start).

### Finally:

1. You did put some unit tests in, didn’t you?