**Compiling Modular Source Code**   
  
Workshop 1 (out of 10 marks - 3% of your final grade)

In your first workshop, you are to sub-divide a simple program into two modules and compile the modules separately, on different platforms.

**LEARNING OUTCOMES**

Upon successful completion of this workshop, you will have demonstrated the abilities

* to organize source code into modules, with header and implementation files
* to compile and run modular programs on different platforms
* to accurately describe the work you have done

**ORIGINAL SOURCE CODE - ALL GROUPS**

Save the following program as **w1step1.cpp** on your local computer:

// OOP244 Workshop 1: Compiling modular source code

// File w1step1.cpp

// Version 1.0

// Date 2015/05/07

// Author Franz Newland

// Description

// This provides some source code in a single file to break

// into modules and compile together

//

// Revision History

// -----------------------------------------------------------

// Name Date Reason

// F.Newland 2015/01/09 Preliminary release

/////////////////////////////////////////////////////////////////

#include <iostream>

#include <iomanip>

using namespace std;

const char\* printMsg = "Finished... Exiting\n"; //End message

const char\* errMsg = "Try again\n"; //Error message

const char\* cancelMsg = "Order cancelled - Start again\n"; //Cancel message

//Functions

int checkout(); // Display menu and return selection

int main(){

int iCost = 0; // Selected item cost

int iTotal = 0;

cout << "SeneKEA Order Tool\n"

<< "======================\n";

// process user input

while (iCost != 10){

iCost = checkout();

if (iCost == 0)

cout << errMsg;

else if (iCost == -1) {

iTotal = 0;

cout << cancelMsg;

}

else if (iCost == 10) {

cout << "Total is $" << iTotal << endl;

cout << printMsg;

}

else {

cout << "Total increases by $" << iCost << endl;

iTotal += iCost;

}

}

return 0;

}

// int checkout()

// Description: prompts for and accepts an option selection from

// standard input and returns the integer price for the selected option

// Outputs: returns the price of the selected option, -1 to cancel, 10 to pay

// or 0 otherwise

///////////////////////////////////////////////////////////////////////////

int checkout(){

int iSelection = 0; //storage of the user response

int iPrice = 0;

cout << '\n';

cout << "Please select from the following options :\n";

cout << " 1 Shelf unit $2\n";

cout << " 2 Desk $4\n";

cout << " 3 Bed $4\n";

cout << " 4 Chair $2\n";

cout << " 5 Pay\n";

cout << " 6 Cancel\n";

cin >> iSelection;

if ((iSelection > 0) && (iSelection < 7)){//if user response is valid

if (iSelection == 1 || iSelection == 4)

iPrice = 2;

else if (iSelection < 5)

iPrice = 4;

else if (iSelection == 5)

iPrice = 10;

else

iPrice = -1;

cout << "Thank you\n";

}

else

cout << "Incorrect entry\n";

return iPrice;

}

Compile **w1step1.cpp** and run the executable on

* Linux

|  |
| --- |
| **g++ -o w1step1 w1step1.cpp -Wall**  **w1step1** |

* Windows

Download **w1step1.cpp**  to your local windows PC.  
Create a simple empty console project in visual studio and copy the files into your project directory, then compile and run your workshop;

Creating a simple empty console project:  
- open visual studio  
- click File/New/Project  
- in New Project screen make sure the two checkboxes above the OK button are unchecked (uncheck “Create directory for solution” and “Add to source control”  
- in New Project screen, in Name section type “workshop1”  
- in New Project screen, in Location section select a proper directory for your workshop1  
- in Template section select “Visual C++/Win32/Win32 Console Application”  
- click on OK  
- In “Win32 Application Wizard – workshop1” screen click on “Next” button  
- make sure all the checkboxes are “UNCHECKED”, and then check “Empty project”  
- Make sure that in this screen there are only two selected items; “Console Application” and “Empty project”  
- click on Finish button

The empty project is created!

Copying and adding the files to your project.

- In solution explorer Right click on workshop1 and select “Open Folder in File Explorer”  
- copy w1step1.cpp to the opened folder.  
- in Solution Explorer/workshop1 right click on “Source Files” and select “Add/Existing Item”  
- in “Add Existing Item – workshop1” screen select **w1step1.cpp** click on Add button select

The file is added to workshop1 project.

To compile and execute the project you can either press Ctrl+F5 or select “DEBUG/Start without debugging”

**MODULAR SOURCE CODE – Minimum task (TOTAL 10 MARKS)**

**PART 1 - (due AT THE END of THE LAB SESSION – 7 MARKS)**

Once **w1step1.cpp** runs successfully on each platform, sub-divide **w1step1.cpp** into

1. a main module named **w1**
   * a header file named **w1.h**
   * an implementation file named **w1.cpp**
2. a **checkout** module
   * a header file named **checkout.h**
   * an implementation file named **checkout.cpp**

Your **w1.h** header file should only contain the message definitions.

Your **checkout.h** header file should only contain the **checkout()** prototype.  Add header comments to each file.

Recompile your modularized source code and run the executable on

* Linux

|  |
| --- |
| **g++ -o w1 w1.cpp checkout.cpp**  **w1** |

* Windows
  + If they are not already added to the project, add the files to the project you already created.
  + Remove w1setp.cpp from the project; right click on **w1step1.cpp**  in Solution Explorer and click on “Remove”.
  + Compile and execute the project.

Part 1; In Lab Submission

1. You will be submitting your files directly from your **matrix** account.
2. Upload all your modules (**w1.h, w1.cpp, checkout.h, checkout.cpp**, **w1.txt)** your **matrix** account (if they are not there already)
3. From the directory of your workshop 1 on matrix run the following command:  
   **> ~fardad.soleimanloo/submit\_w1\_in\_lab <ENTER>**
4. Follow the instructions.

If everything is done properly, your workshop reflection will be submitted. If there is any problem a message will be shown explaining what the problem is.

Please not that if you do not submit this during the lab, you will have to submit Part 2 only. In this case, the maximum mark you can gain is 7.

**PART 2 – REFLECTION**

**(due ON SEPTEMBER 20, 2015 AT 8PM – 3 MARKS)**

Based on the work you have done for this workshop, please answer following questions and place them in a file name named **reflect.txt**.

1. What is the benefit of dividing this solution into 2 modules?
2. When compiling using **g++**, state the meaning of the following command line switches.
   1. **-o**
   2. **-Wall**

**SUBMISSION**

Matrix

1. You will be submitting your files directly from your **matrix** account.
2. Upload all your modules (**w1.h, w1.cpp, checkout.h, checkout.cpp**, **w1.txt, reflect.txt)** your **matrix** account.
3. From the directory of your workshop 1 on matrix run the following command:  
   **> ~fardad.soleimanloo/submit\_w1\_reflect <ENTER>**
4. Follow the instructions

If everything is done properly, your workshop reflection will be submitted. If there is any problem a message will be shown explaining what the problem is.