

SCHOOL OF COMPUTER SCIENCE

COURSEWORK ASSESSMENT PROFORMA

MODULE & LECTURER: CM3103, Professor David Walker

DATE SET: 10 October 2018

SUBMISSION DATE: 7 December 2018 at 9:30am

SUBMISSION ARRANGEMENTS: See below

TITLE: Parallel Programming with OpenMP

This coursework is worth 10% of the total marks available for this module. The penalty for late or non-submission is an award of zero marks. You are reminded of the need to comply with Cardiff University's Student Guide to Academic Integrity. Your work should be submitted using the official Coursework Submission Cover sheet.

INSTRUCTIONS

1. Download the sequential code, blur.c, and the input file, David.ps, from Learning Central.
2. Edit blur.c to correctly refer to the input and output files in your file system.
3. Compile and run blur.c several times (say, between 6 and 10 times), noting the time for the execution of the main computational work. Evaluate the average and standard deviation of these times.
4. Parallelize the main computational loops (the *for* loops over row and col) using OpenMP directives, to produce a code named blurOMP.c.
 - a. For dynamic scheduling, make timing measurements for differing numbers of threads and chunk size values. The maximum number of threads should be 4 times the number of cores. As in part 3, the times you present should be averages over several runs.
 - b. Repeat part (a) for static scheduling.

[3 marks for correct parallel code]
5. Write a report (2 or 3 pages of text, plus figures) that presents and interprets the results of your timing experiments. The report should include:
 - a. A description of the hardware and software environment [1 mark].
 - b. A description of the timing experiments carried out [1 mark].
 - c. Appropriate graphs of your timing experiments [2 marks].
 - d. A discussion of the results that demonstrates a qualitative understanding of the timings, and accounts for any unusual features [2 marks].
 - e. A short section presenting any overall conclusions, and giving a reflection on what you have learned from this coursework [1 mark].

SUBMISSION INSTRUCTIONS

All submissions should be via Learning Central unless agreed in advance with the Director of Teaching. Students should submit all their files as a single zip (*.zip) files.

Description		Type	Name
Cover sheet	Compulsory	One PDF (*.pdf) file	[student number].pdf
Report	Compulsory	One PDF (*.pdf) file, including any relevant plots.	report_[student number].pdf
Code	Compulsory	One or more C source files	No restriction
Input image file	Compulsory	One Postscript (*.ps) file	David.ps
Output image file	Compulsory	One Postscript (*.ps) file	DavidBlur.ps
Output data file	Optional	One Excel (*.xlsx or *.xls) file	Spreadsheet of your timing data

CRITERIA FOR ASSESSMENT

See instructions above for mark scheme.

Feedback on your performance will address each of these criteria.

FURTHER DETAILS

Feedback on your coursework will address the above criteria and will be returned in approximately 2 work weeks.

This may be supplemented with oral feedback via individual appointment.