

UNIVERSITY OF CAMBRIDGE COMPUTER LABORATORY

First-Year Computer Science

Practical Class — Week 2

This notice is primarily concerned with describing the arrangements for the assessed practical work from Week 3 until the end of the Michaelmas Term.

The Wednesday 5 p.m. Deadline

From Week 3, everyone will be allocated a Ticker, someone who will assess the exercises and offer advice. An appended schedule shows who are *odds* and who are *evens* and who has which Ticker. It also provides a timetable of appointments for this term.

Tickers are advised that anyone who arrives at the scheduled time for an appointment has absolute priority. If your Ticker is attending to someone else at your appointed time please, politely, make your presence known.

From Week 3 (for the *odds*) and Week 4 (for the *evens*), the work set for a given week must be completed by 5 p.m. on the Wednesday before the Thursday class. This will give the Tickers an evening and a morning to check the work.

The Blue Racks

If you take the Cockcroft Building lift to Floor 4 you will find, on leaving the lift, that on a table on your left there are some blue letter-racks. There is one rack for each Ticker and labels indicate which rack is which. Each completed exercise must be placed in the appropriate rack by the Wednesday deadline.

Thursday Afternoon Debriefings in the Cockcroft Building Floor 4

Next day, on Thursday afternoon, each *odd* (or each *even*) must go to the Cockcroft Building Floor 4, at the time shown on the schedule, for a $7\frac{1}{2}$ minute debriefing. There is plenty of space so *walk straight in* even if the appointment is some time off!

At this debriefing, the Ticker will discuss the work, ask a few questions about it, point out any inelegances and (almost always) initial the work and issue a Tick. It is essential to check the initialling (a Ticker may need reminding!) and to keep the initialled work.

Required Format of Submitted Work

The Tickers will insist that the layout of the work to be assessed conforms to a particular format. The Guided Practical Session for this week, Week 2, shows how the required format should be applied this time to secure Tick 2.

For further guidance, an outline of what it is hoped will be submitted for Tick 3 (in Week 3 or in Week 4) is shown overleaf on two facing pages. A number of observations follow this illustration; please read the observations carefully!

Tick3

(* ML ASSESSED EXERCISES. TICK 3 SUBMISSION FROM F.H. KING. *)
(* Estimated time to complete: 30 mins. Actual time: 1 hour. *)

(* Note that in all three solutions, it is assumed that any list presented as an argument is of adequate length. Match exceptions are not caught. *)

(* PROBLEM 1. A function last(...) *)

```
fun last (x::[]) = x  
  | last (x::rest) = .....
```

(* The time complexity of last(xs) is $O(\dots)$ whereas the time complexity of hd(rev xs) is $O(\dots)$
The space complexity of last(xs) is $O(\dots)$ whereas the space complexity of hd(rev xs) is $O(\dots)$ *)

(* PROBLEM 2. A function butLast(...) *)

```
fun butLast [x] = []  
  | butLast .....
```

(* The time complexity of butLast(xs) is $O(\dots)$ whereas the time complexity of rev(tl(rev xs)) is $O(\dots)$
The space complexity of butLast(xs) is $O(\dots)$ whereas the space complexity of rev(tl(rev xs)) is $O(\dots)$ *)

(* PROBLEM 3. A function nth(...) *)

```
fun nth (x::rest, 0) = .....  
  .....
```

Tick3

FAM CML started on 29-Sep-1998 10:44:32
(version 4.2.00 of Sep 23 1994)
Image file H:\APPSPC\CML\CML.EXP
(written on 29-Aug-1994 16:25:54 by FAM version 4.2.00)
[Loading Foreign Heap (Converting for Generic Use)]

Edinburgh ML for DOS/Win32s/Unix (C) Edinburgh University &
A C Norman

```
- use "F:\\Tick3.txt";
> () : unit
[Opening F:\\Tick3.txt]
***Warning: Patterns in Match not exhaustive
> val last = Fn : ('a list) -> 'a
***Warning: Patterns in Match not exhaustive
> val butLast = Fn : ('a list) -> ('a list)
***Warning: Patterns in Match not exhaustive
> val nth = Fn : (('a list) * int) -> 'a
[Closing F:\\Tick3.txt]
-
- val pye = [3,1,4,1,5,9];
> val pye = [3,1,4,1,5,9] : int list
-
-
- last pye;
> 9 : int
-
- last [];
Exception: Match raised
-
-
- butLast pye;
> [3,1,4,1,5] : int list
-
- butLast [4];
> [] : int list
-
-
- nth (pye, 4);
> 5 : int
-
-
- nth (pye, 6);
Exception: Match raised
-
-
```

Observations about Layout

- There should be two parts to each submission, a file containing ML source text and comments, and a file containing a short ML session in which the functions in the file are tested. The source file should contain only comments and functions, no tests.
- Every submission should begin with at least two comments. The first should indicate the number of the Tick and the name of whoever is submitting the work. The second should show the time estimated to complete the problem and the time actually taken.
- Each problem should be introduced by a comment which indicates the number of the problem.
- Answers are of two kinds. Some should be presented as ML functions and others should be presented as a few lines of explanation wrapped up as a comment.
- There should be plenty of blank lines and a generally tidy appearance. It is permissible to edit out some of the verbosity of error messages.
- Submissions must be securely fastened together with the ML source text *on top of* the short ML session (use staples not paper-clips).

Plagiarism

Learning from one another can be just as important as studying the material presented in lectures. It is both inevitable and acceptable that the first-year assessed exercises will be discussed by those who have to work through them. By contrast, simply copying one another's submissions is not acceptable and the University has stringent rules on plagiarism.

At the debriefing sessions, the Tickers routinely ask questions that test the submitters' understanding of the work submitted. If you submit an ML program that you have thought about, keyed in, and thoroughly tested yourself, you will have no difficulty answering these questions.

Re-Submission

Once in a while, a Ticker may ask for a submission to be improved. In such a case, the revised version should be put in the appropriate rack before your next ticking session together, of course, with the scheduled submission for that week. It is most unusual to require more than one re-submission to secure a Tick.

Hardware Practical Work — Paper 2 Candidates only

An appended schedule shows who has been allocated to which Hardware practical class. In the Michaelmas Term, the *odds* who see their Tickers in odd weeks have Hardware practicals in even weeks and the *evens* have Hardware practicals in odd weeks. The first Hardware practicals are on the Thursdays of Week 3 and Week 4.

Each CST candidate will have three Hardware practicals in the Michaelmas Term and four in the Lent. One assessed experiment is undertaken at each practical and seven ticks are gained in all for Hardware.

Lent Term — Java Practical Classes — All Candidates

An appended schedule shows who has been allocated to which Java practical class. Each Thursday in the Lent Term there is a Java class that runs from from 2 pm to 4 pm followed by another class that runs from 4 pm to 6 pm.

Computer Science candidates who have morning Hardware classes will be allocated to the 2 pm to 4 pm Java class and those who have afternoon Hardware classes will finish in time for the Java class that runs from 4 pm to 6 pm.

Note that everyone has a two-hour Java practical class *every week*. The outline plan for each class is:

- Work through a Java handout.
- Embark on the associated exercise.
- Secure a tick for the previous week's exercise.

Exercises will be submitted electronically in a way which will be described in the Java handouts. The allocation of Tickers (as in A, B, C or D) is the same as in the Michaelmas Term.

Tickers A and B will attend the 2 pm to 4 pm Java classes and Tickers C and D will attend the 4 pm to 6 pm Java classes. During the classes, the Tickers will visit their clients rather than the other way round. The approximate assessment times are indicated on the schedule as offsets from the start times of the practical classes.

The first Lent Term practical class is special in that there is no immediately previous week. In this first week, the Tickers will assess the sixth ML exercise.

The last Lent Term practical class is also special in that no Java exercise will be set that week.

Arrangements for the Easter Term

There will be no practical classes in the Easter Term when the time thereby gained can usefully be spent on revision.

The Computer Laboratory Web Site

It is essential to be familiar with the Computer Laboratory web site whose home page is to be found at:

<http://www.cl.cam.ac.uk>

Most of the information you are likely to find immediately useful is accessed by clicking Information for Current Tripos students.

This link brings up a page which incorporates further useful links. Note, particularly, Teaching course material and links under the section headings Examinations and Lecture timetables. One of the links under Examinations is Formal notices about the examinations. Clicking this brings up a page which contains links to numerous formal documents relating to the Computer Science Tripos.

Among these documents are the Head of Department's Announcements which were issued in Week 1. Those who are interested in the minutiae of the examination arrangements might try the link to the Marking Scheme and Classing Convention document.

Two Marks Per Tick

In the Tripos Examination at the end of the year, the published mark for each written paper is out of 80 marks and the associated practical work accounts for another 20 marks. Each assessed exercise leads to a single Tick. Ten Ticks are associated with Paper 1 and another ten are associated with Paper 2.

In consequence, each Tick counts as two raw marks. Fractions of Ticks are not awarded so, for each exercise, you either score two marks or no marks.

Sometimes it is suggested that it is unsound to reward a barely-acceptable submission with the same mark as a highly polished product. This policy is intended to discourage candidates from making endless time-consuming refinements in the hope of gaining a marginally better assessment.

It should also be noted that a strong candidate who produces an acceptable submission in one hour gains time over a weak candidate who takes four hours. This gain translates into extra study time and ultimately into better performance on the written papers.

F.H. King
15 October 2009

ML TICKING SESSIONS — MICHAELMAS TERM THURSDAYS IN 2009–10

The Odd-Thursdays Groups — Weeks 1, 2, 3, 5, and 7

Demonstrators and Times

Time	Ticker A	Ticker B	Ticker C	Ticker D
2.00	Akra, A.M. ^p	Cowton, L.R. ^x	Aboobakar, M.F. ^o	Irish, H.C. ^o
2.07½	Allen, J.-M.A. ^x	Cross, S.M. ^p	Ahmed, M. ^o	Jarvis, M.F. ^x
2.15	Amarsi, A.M. ^x	Cunningham, E.J. ^x	Arulkumaran, K. ^o	Jones, R.L. ^o
2.22½	Azpiroz-Korban, J.E. ^x	Day, F.V. ^x	Ashton, E.D. ^o	Killough, M.J. ^o
2.30	Balogh, M. ^x	Day, M.D.J. ^x	Caller, B.S. ^o	Kram, J.D. ^x
2.37½	Bargery, L.J. ^x	Dittes, B.C.M. ^p	Cheung, H.C.S. ^o	Layfield, O.P. ^x
2.45	Beardmore, F.S.W. ^x	Gibbons, A.H. ^x	Chowdhury, M.R. ^o	Li, C. ^p
2.52½	Beaumont, S.J. ^p	Goodenough, M.W.A. ^p	Crooks, N.S.C. ^o	Lica, A.S. ^p
3.00	Bergman, A. ^p	Guruswamy, T. ^x	Curello, G. ^o	Lindstrom, C.A. ^x
3.07½	Bland, J.R. ^x	Hague, C.A. ^x	Danka, M.A. ^o	Liotsiou, D. ^p
3.15	Bowers, W.A. ^x	Hall, R.M. ^p	Elsby, C.J.R. ^o	Liu, Y. ^x
3.22½	Burksaitis, A. ^p	Harvey, D.M. ^x	Green, D. ^o	Loew, D. ^x
3.30	Bytheway, T.A. ^p	Hillary, E.J. ^p	Harvey, J.E. ^x	Low, W.X.A. ^x
3.37½	Chau, K.C.I. ^p	Hobson Sayers, A.P. ^p	Hellier, J.D.M. ^x	Marks, I.H. ^x
3.45	Chen, D. ^p	Keen, W.P. ^p	Herbst, M.F. ^x	Maughan, J.M. ^x
3.52½	Colliver, E.C. ^x	Kenyon, W. ^p	Hinks, M.J. ^x	McManus, M.D. ^x
4.00	Conway, M.J. ^p	Lepper, A.J. ^p	Holding, L.H.L. ^x	Norman, S.M. ^x
4.07½	Cowan, P.R. ^p			

ML TICKING SESSIONS — MICHAELMAS TERM THURSDAYS IN 2009–10

The Even-Thursdays Groups — Weeks 1, 2, 4, 6, and 8

Demonstrators and Times

Time	Ticker A	Ticker B	Ticker C	Ticker D
2.00	Lockett, J.A. ^p	Sargent, M.J. ^x	Lawrence-Jones, J.V. ^o	Tsoi, Y.C.J. ^x
2.07½	Long, X. ^p	Scaton, J. ^x	Lim, K.V.R. ^o	Vaghela, M.B. ^x
2.15	Lonsdale, T.B. ^p	Semeniuk, K. ^x	Mannan, F.A. ^o	Vaquero-Stainer, C.P. ^x
2.22½	Lucas, S.E. ^p	Shah, J. ^p	Mao, J.X. ^o	Vogt, L.O. ^x
2.30	Marsh, W. ^p	Shaikh, A.A. ^p	Mehandzhiyski, Y.R. ^o	Vriend, P.B. ^x
2.37½	Morland, W.M. ^p	Silaghi, D. ^p	Narula, H. ^o	Wang, J.Q. ^x
2.45	Norris, J.J. ^x	Skehin, N. ^p	Newstead, C.W. ^o	Watson, L.R.A. ^x
2.52½	Ostasevicius, T. ^x	Soloviev, M. ^p	Pace, E.T. ^o	Webb, B.J. ^x
3.00	Pappenheim, E.R. ^x	Stannard, O.J. ^p	Peskett, M. ^o	Wells, A.W.J. ^x
3.07½	Pinski, P. ^x	Stanyon, P.G. ^x	Roffey, J. ^o	Withnall, P.R. ^p
3.15	Potts, A.T. ^x	Tait, E.W. ^x	Sarkar, A. ^o	Wood, E.W. ^o
3.22½	Reed, S.L. ^x	Tang, H. ^p	Shaw, B.D. ^o	Wood, J.A. ^x
3.30	Rex, S.K. ^x	Tang, S. ^x	Taylor, N.J. ^x	Xie, C. ^x
3.37½	Robertson, A. ^x	Tian, B. ^p	Tchokni, S.E. ^o	Xu, B. ^x
3.45	Robertson, F.R. ^p	Tomlinson, N.S. ^p	Thamotheram, D.G. ^x	Yeeles, P.M. ^p
3.52½	Ryrie, A.M. ^x	Wang, R. ^p	Tran, T.K. ^x	Zabarauskas, M. ^o
4.00	Sackville-Hamilton, A.C. ^x	Whitehead, R.J.F. ^p	Tsoi, M.C. ^x	Zupkauskas, M. ^x

HARDWARE PRACTICALS — MICHAELMAS TERM THURSDAYS IN 2009–10

Even Thursdays a.m.	Even Thursdays p.m.	Odd Thursdays a.m.	Odd Thursdays p.m.
Akra, A.M. ^p	Aboobakar, M.F. ^o	Lockett, J.A. ^p	Lawrence-Jones, J.V. ^o
Beaumont, S.J. ^p	Ahmed, M. ^o	Long, X. ^p	Lim, K.V.R. ^o
Bergman, A. ^p	Arulkumaran, K. ^o	Lonsdale, T.B. ^p	Mannan, F.A. ^o
Burksaitis, A. ^p	Ashton, E.D. ^o	Lucas, S.E. ^p	Mao, J.X. ^o
Bytheway, T.A. ^p	Caller, B.S. ^o	Marsh, W. ^p	Mehandzhiyski, Y.R. ^o
Chau, K.C.I. ^p	Cheung, H.C.S. ^o	Morland, W.M. ^p	Narula, H. ^o
Chen, D. ^p	Chowdhury, M.R. ^o	Robertson, F.R. ^p	Newstead, C.W. ^o
Conway, M.J. ^p	Crooks, N.S.C. ^o	Shah, J. ^p	Pace, E.T. ^o
Cowan, P.R. ^p	Curello, G. ^o	Shaikh, A.A. ^p	Peskett, M. ^o
Cross, S.M. ^p	Danka, M.A. ^o	Silaghi, D. ^p	Roffey, J. ^o
Dittes, B.C.M. ^p	Elsby, C.J.R. ^o	Skehin, N. ^p	Sarkar, A. ^o
Goodenough, M.W.A. ^p	Green, D. ^o	Soloviev, M. ^p	Shaw, B.D. ^o
Hall, R.M. ^p	Irish, H.C. ^o	Stannard, O.J. ^p	Tchokni, S.E. ^o
Hillary, E.J. ^p	Jones, R.L. ^o	T'ang, H. ^p	Withnall, P.R. ^p
Hobson Sayers, A.P. ^p	Killough, M.J. ^o	Tian, B. ^p	Wood, E.W. ^o
Keen, W.P. ^p	Li, C. ^p	Tomlinson, N.S. ^p	Yeeles, P.M. ^p
Kenyon, W. ^p	Lica, A.S. ^p	Wang, R. ^p	Zabarauskas, M. ^o
Lepper, A.J. ^p	Liotsiou, D. ^p	Whitehead, R.J.F. ^p	

JAVA PRACTICAL CLASSES — LENT TERM THURSDAYS IN 2009–10

Time Offset	2 p.m. to 4 p.m. Ticker A	2 p.m. to 4 p.m. Ticker B	4 p.m. to 6 p.m. Ticker C	4 p.m. to 6 p.m. Ticker D
0.00	Akra, A.M. ^P Allen, J.-M.A. ^x Amarsi, A.M. ^x Azpiroz-Korban, J.E. ^x	Cowton, L.R. ^x Cross, S.M. ^P Cunningham, E.J. ^x Day, F.V. ^x	Aboobakar, M.F. ^o Ahmed, M. ^o Arulkumaran, K. ^o Ashton, E.D. ^o	Irish, H.C. ^o Jarvis, M.F. ^x Jones, R.L. ^o Killough, M.J. ^o
0.15	Balogh, M. ^x Bargery, L.J. ^x Beardmore, F.S.W. ^x Beaumont, S.J. ^P	Day, M.D.J. ^x Dittes, B.C.M. ^P Gibbons, A.H. ^x Goodenough, M.W.A. ^P	Caller, B.S. ^o Cheung, H.C.S. ^o Chowdhury, M.R. ^o Crooks, N.S.C. ^o	Kram, J.D. ^x Layfield, O.P. ^x Li, C. ^P Lica, A.S. ^P
0.30	Bergman, A. ^P Bland, J.R. ^x Bowers, W.A. ^x Burksaitis, A. ^P	Guruswamy, T. ^x Hague, C.A. ^x Hall, R.M. ^P Harvey, D.M. ^x	Curello, G. ^o Danka, M.A. ^o Elsby, C.J.R. ^o Green, D. ^o	Lindstrom, C.A. ^x Liotsiou, D. ^P Liu, Y. ^x Loew, D. ^x
0.45	Bytheway, T.A. ^P Chau, K.C.I. ^P Chen, D. ^P Colliver, E.C. ^x	Hillary, E.J. ^P Hobson Sayers, A.P. ^P Keen, W.P. ^P Kenyon, W. ^P	Harvey, J.E. ^x Hellier, J.D.M. ^x Herbst, M.F. ^x Hinks, M.J. ^x	Low, W.X.A. ^x Marks, I.H. ^x Maughan, J.M. ^x McManus, M.D. ^x
1.00	Conway, M.J. ^P Cowan, P.R. ^P Lockett, J.A. ^P Long, X. ^P	Lepper, A.J. ^P Sargent, M.J. ^x Seaton, J. ^x Semeniuk, K. ^x	Lawrence-Jones, J.V. ^o Lim, K.V.R. ^o Mannan, F.A. ^o Mao, J.X. ^o	Norman, S.M. ^x Tsoi, Y.C.J. ^x Vaghela, M.B. ^x Vaquero-Stainer, C.P. ^x
1.15	Lonsdale, T.B. ^P Lucas, S.E. ^P Marsh, W. ^P Morland, W.M. ^P	Shah, J. ^P Shaikh, A.A. ^P Silaghi, D. ^P Skchin, N. ^P	Mehandzhiyski, Y.R. ^o Narula, H. ^o Newstead, C.W. ^o Pace, E.T. ^o	Vogt, L.O. ^x Vriend, P.B. ^x Wang, J.Q. ^x Watson, L.R.A. ^x
1.30	Norris, J.J. ^x Ostasevicius, T. ^x Pappenheim, E.R. ^x Pinski, P. ^x	Soloviev, M. ^P Stannard, O.J. ^P Stanyon, P.G. ^x Tait, E.W. ^x	Peskett, M. ^o Roffey, J. ^o Sarkar, A. ^o Shaw, B.D. ^o	Webb, B.J. ^x Wells, A.W.J. ^x Withnall, P.R. ^P Wood, E.W. ^o
1.45	Reed, S.L. ^x Rex, S.K. ^x Robertson, A. ^x Robertson, F.R. ^P	Tang, H. ^P Tang, S. ^x Tian, B. ^P Tomlinson, N.S. ^P	Taylor, N.J. ^x Tchokni, S.E. ^o Thamotheram, D.G. ^x Tran, T.K. ^x	Wood, J.A. ^x Xie, C. ^x Xu, B. ^x Yeecles, P.M. ^P
2.00	Ryrie, A.M. ^x Sackville-Hamilton, A.C. ^x	Wang, R. ^P Whitehead, R.J.F. ^P	Tsoi, M.C. ^x	Zabarauskas, M. ^o Zupkauskas, M. ^x

