Homework Project #2 – Pace Calculator

**Assigned:** May 20\(^{th}\), 2015

**Due:** June 1\(^{st}\) (11:59pm)

**Submission Format:** You will submit a soft copy of your C program solution. Name the submission file HW2.c. This copy will be submitted through Canvas (http://lss.at.ufl.edu/).

**Assignment:**

You will be creating a simple pace calculator. We will define **pace** as the amount of time that takes a runner to move a specific distance (be it 1 mile or 1 kilometer). Examples of paces are: 10:00/mile (10 minutes per mile) or 6:55/km (6 minutes 55 seconds per kilometer).

Your program will receive 3 input values that will be read through the console (using the `scanf` function):

1. A race distance (‘a’ for 5km, ‘b’ for 10km, ‘c’ for 15km, ‘d’ for half-marathon, ‘e’ for full marathon).
2. Preferred distance unit (‘k’ for kilometers, ‘m’ for miles).
3. An expected finish time (hh:mm:ss).

Based on these inputs your program will compute the average pace a runner will need to run to complete the selected race distance in the expected finish time. Notice that the average pace needs to be provided in the unit the user selected (i.e. if for number 2 the user selects “k”, then the output will be in time/km; and if for number the user selects “m”, then the output will in time/mile).

The following usage examples display exactly the text that we expect to see on the terminal/console. Unless approved by the instructor, follow the format as close as possible.

**Green highlights display user input**

**Blue highlights are the computed pace based on those inputs**

**Example #1:**

Which race are you interested in running?

a. 5K  
b. 10K  
c. 15K  
d. Half Marathon  
e. Full Marathon

Please type the letter corresponding to the race you want to select: e

What unit of distance do you prefer? (‘k’ for km and ‘m’ for miles) k

What is your estimated finish time for this race (hh:mm:ss)? 4:30:00

Your average pace would be: **00:06:23 per km**
Example #2:

Which race are you interested in running?
- a. 5K
- b. 10K
- c. 15K
- d. Half Marathon
- e. Full Marathon

Please type the letter corresponding to the race you want to select: d

What unit of distance do you prefer? ('k' for km and 'm' for miles) m

What is your estimated finish time for this race (hh:mm:ss)? 2:15:00

Your average pace would be: 00:10:17 per mile

Table 1 Distance conversion reference. As a hint, the fields bolded and in italic are enough to create your program (The others can be computed based on them)

<table>
<thead>
<tr>
<th>Distance</th>
<th>Kilometers</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 km</td>
<td>1 km</td>
<td>0.6213 mi</td>
</tr>
<tr>
<td>1 mile</td>
<td>1.609 km</td>
<td>1 mi</td>
</tr>
<tr>
<td>5km</td>
<td>5 km</td>
<td>3.1065 mi</td>
</tr>
<tr>
<td>10km</td>
<td>10 km</td>
<td>6.213 mi</td>
</tr>
<tr>
<td>15km</td>
<td>15 km</td>
<td>9.3195 mi</td>
</tr>
<tr>
<td>Half marathon</td>
<td>21.1 km</td>
<td>13.109 mi</td>
</tr>
<tr>
<td>Full Marathon</td>
<td>42.2 km</td>
<td>26.21886 mi</td>
</tr>
</tbody>
</table>

Section | Grading criterion                                                                 | Point value |
---------|-----------------------------------------------------------------------------------|-------------|
Program functionality (75%) | Following the format provided | 5%          |
|         | Reading input values from console correctly                                       | 5%          |
|         | Correctly computing the pace                                                     | 30%         |
|         | Correctly displaying the pace on screen (including: making sure minutes and seconds are integers less 60, and always display as two digit numbers) | 5%          |
|         | Correct use of units (km and mi)                                                 | 20%         |
|         | Supporting all 5 possible distances                                               | 10%         |

Good programming practices (10%) | Beginning your file with a comment that includes: your name, the name of the class, your instructor's name and a brief explanation of what the program does. (Include any issues that you were unable to solve in this comment) | 3%          |
| Use meaningful variable names | 2%          |
| Use good tabulation           | 2%          |
| Provide meaningful comments at least of your calculation of the pace. (You do not need to include comments for input/output) | 3%          |

Compilation (no errors – no warnings) | 15%         |