

SPU 26 Assignment 2 Part 1 due Fri. Sept. 21st (entries on course website), Part 2 Mon, Sept. 24th (turned into class).

Purpose: We want to teach you skills that will help your dead reckoning. In particular, we will work with you in section to measure the length of your paces, your walking speed on level ground and the angular widths of combinations of fingers and the outstretched hand. These measures, in turn will help you to refine your dead reckoning skills, which we will test in assignment 3. In addition to this, we will look at the means and standard deviations of quantities for the class as a whole. Finally, we'll explore whether some variables are correlated, such as pace length and speed.

In section: You will measure the number of paces in 100 feet over four trials and get a time value for how long it takes to traverse 100 feet. You will also measure the angular widths of combinations of fingers and your hand at the end of an outstretched arm.

Part – 1 data entries due by Midnight, Friday, September 21st

Providing you walk at a predictable pace, this will help your dead reckoning. You walk a course of 100 feet. Someone will time you over this distance. You count the number of paces over the course. Remember that a “pace” is when the same foot hits the ground (e.g. left to left or right to right).

Recall that there are 5280 feet per mile, so converting the number of paces per 100 feet means that you multiply $(5280/100)=52.8$ times the number of paces in 100 feet to get the number of paces per mile. It should be close to 1000, give or take.

In order to get the number of paces per minute, you can convert from the number of seconds and the number of paces you took. $(\text{Number of paces})/(\text{time in seconds}) \times (60 \text{ seconds})/(1 \text{ minute}) = (\text{Number of paces})/(\text{minute})$.

In order to get the walking speed in miles per hour, you can first find your walking speed into feet/second by dividing 100 feet by the number of seconds you took to cover that distance. Multiply this number by $(3600 \text{ seconds}/1 \text{ hour})$ to get feet/hour, and then multiply this number by $(1 \text{ mile}/5280 \text{ feet})$ to get miles/hour.

A) Enter on form: Enter the angular widths of the combinations of fingers and hand, your height and inseam as found during section.

B) Enter on form: For each of the four trials in section, write down these numbers and your name in the form provided on the page for Week 3 on the course website. Also, calculate the mean, standard deviation and uncertainty on the mean for these quantities and enter these. You may find it easiest to use a spreadsheet to calculate these.

C) Enter on course website: The information requested, from your form. Keep the form to turn in on Monday, along with information from the class as a whole.

Part – 2 due at the start of lecture Monday, Sept. 24th.

By Saturday morning (Sept. 22nd), we will make the class data available to you in both a Google docs and an Excel spreadsheet format. Find the mean speed, number of paces per mile, and turnover for the class as a whole. Report the standard deviation and uncertainty on the mean for the class as a whole.

Find the correlation coefficient between pace length and walking speed. Find the correlation coefficient between inseam and walking speed. Report these.

Note: if you have problems completing this by lecture, please contact your TF in advance of the lecture.