

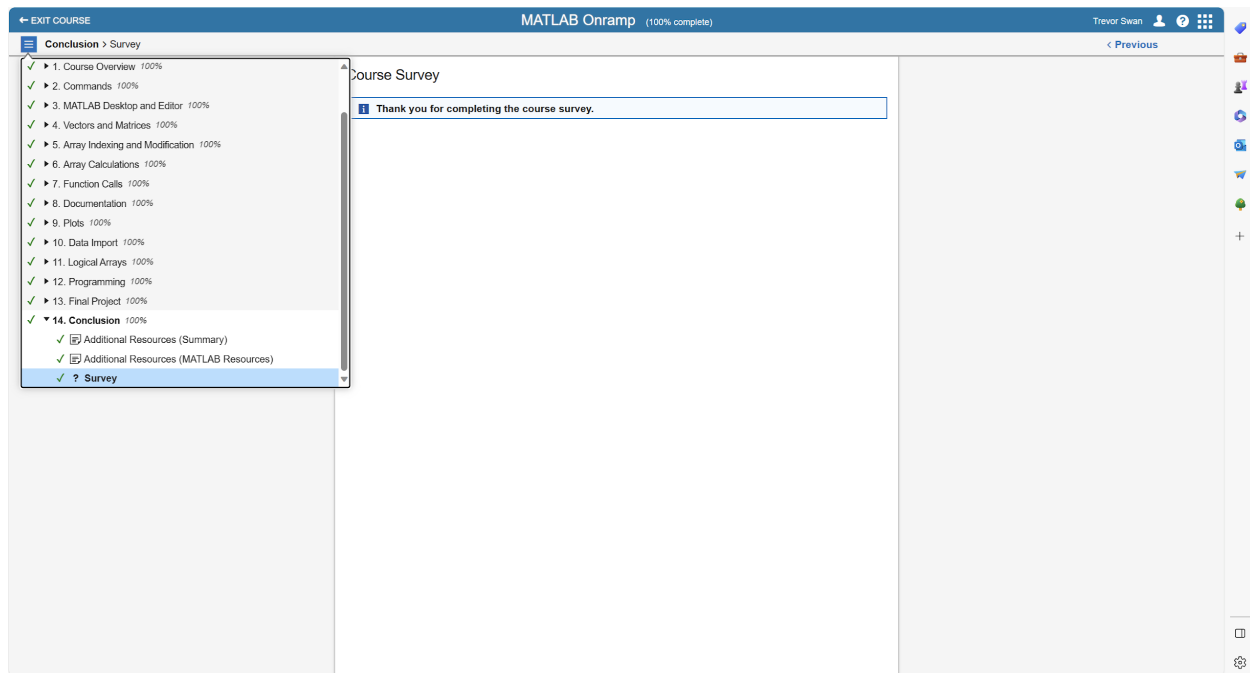
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% ENGR 130 HW4

% Section E

% September 17, 2023

MATLAB On-ramp Final Part



Question 3 Algorithm

I will assume that the person using this algorithm has access to a file containing a class's grades.

1. Paste a vector or matrix file containing a class's grades, this should be named 'score'
2. Determine the total number of students in the class using a built in size function
3. Create variables A_count, B_count, C_count, D_count, and F_count, setting them all equal to 0
4. Create a loop that will run an amount of times equal to the total number of students in the class, with a step size of 1
5. In the loop, input a nested conditional statement that starts by checking to see if the student's grade is greater than or equal to 90
6. If this is true, display 'Student X: Score xx, Grade A' Filled in with the student number, their number grade. Add 1 to A_count
7. If the students grade does not meet the previous statement, check to see if the student's grade is greater than equal to 80
8. If this is true, display 'Student X: Score xx, Grade B' Filled in with the student number, their number grade. Add 1 to B_count
9. If the students grade does not meet the previous statements, check to see if the student's grade is greater than equal to 70
10. If this is true, display 'Student X: Score xx, Grade C' Filled in with the student number, their number grade. Add 1 to C_count

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11. If the student's grade does not meet the previous statements, check to see if the student's grade is greater than or equal to 60
12. If this is true, display 'Student X: Score xx, Grade D' Filled in with the student number, their number grade. Add 1 to D_count
13. If the student's grade does not meet the previous statements, their grade must be less than 60. Display 'Student X: Score xx, Grade F' Filled in with the student number, their number grade. Add 1 to F_count
14. Each student's grade should be put through this conditional test, keeping track of the number of students per grade using the "_count" variables. End the conditional statement and the loop once this is the case
15. Take the average of the classes' grades, then take the average of that average to account for data sets that are in matrices as opposed to vectors. Store this average in a variable named 'class_average'
16. Display the class's average score to the user, rounded to 1 decimal place
17. Find the percentage of students who scored an A by dividing A_count by class_size and multiplying by 100, store this value in a variable named 'A_percent'
18. Find the percentage of students who scored a B by dividing B_count by class_size and multiplying by 100, store this value in a variable named 'B_percent'
19. Find the percentage of students who scored a C by dividing C_count by class_size and multiplying by 100, store this value in a variable named 'C_percent'
20. Find the percentage of students who scored a D by dividing D_count by class_size and multiplying by 100, store this value in a variable named 'D_percent'
21. Find the percentage of students who scored an F by dividing F_count by class_size and multiplying by 100, store this value in a variable named 'F_percent'
22. Create a vector named 'percentages' that contains the percentages per letter grade for the class in the order 'A, B, C, D, F'
23. Create a vector named 'letter_grades' that contains the letters: A B C D F, in that order
24. Create a loop that will run 5 times, displaying the percentage of students that received an A, then the percentage of students that received a B, then the percentage of students that received a C, then the percentage of students that received a D, then the percentage of students that received an F.