# Problem 1 (25 pts)

Implement the Following Sorting Algorithms

- Merge Sort
- Quick Sort
- Insertion Sort

You must demonstrate your code by creating your own input files with small, medium and large number of input values (e.g. 15, 50 and 500).

To show your code working, provide screen shots of your code executing printing the input values and the sorted values.

In your readme file, you must describe the heart of each algorithm and then compare and contrast their performance and when you would use them. You must provide exact directions on how to run your code.

# Problem 2 (25 pts)

Research and Implement a Radix Sort

You must demonstrate your code by creating your own input files with small, medium and large number of input values (e.g. 15, 50 and 500).

To show your code working, provide screen shots of your code executing printing the input values and the sorted values.

In your readme file, you must describe the heart of each algorithm and then compare and contrast their performance and when you would use them. You must provide exact directions on how to run your code.

# Problem 3 (50 pts)

You are building a dating web service. There are an equal number of men and women. Implement the gale-shapley algorithm to assign the best dates for the given input. The algorithm mush match the men and women such that no date is unstable.

- Every man ranks the women in order of preference
- Every woman ranks the men in order of preference
- Each man proposes a date to the woman he most prefers
- Each woman either considers the date requests she receives and replies “maybe” to the man she likes best and “no” to all the rest
- As long as there are unmatched men, each man proposes a date to the most preferred woman to whom he has not yet proposed a date too regardless of whether or not she is already matched
- Each woman reviews the new proposals and either replies “maybe” if she is not yet matched or if she prefers this new man to the one she was previously matched to she rejects her previous date and accepts the new request

Demonstrate that your code works by running your solution in a terminal window. You must print your input and the calculated output for each of the supplied input samples.

You should submit a readme.txt file with an explanation of your code and algorithms. You must provide exact instructions on how to run your code and you must submit screen shots of your running code.

# Problem 3

Sample input file:

The first line will be the number of men and women

The following lines will be the person followed by their in-order selections

10
Benjamin Christine Marjorie Florence Katie Cynthia Julia Deborah Stella Karen Roberta
Kenneth Julia Katie Roberta Florence Stella Cynthia Christine Marjorie Karen Deborah
Shane Karen Cynthia Katie Stella Christine Roberta Julia Marjorie Florence Deborah
Barry Stella Karen Julia Deborah Christine Cynthia Marjorie Roberta Katie Florence
Robert Florence Marjorie Deborah Roberta Karen Katie Christine Cynthia Stella Julia
David Julia Stella Florence Marjorie Cynthia Deborah Roberta Christine Katie Karen
Travis Deborah Roberta Katie Stella Julia Cynthia Florence Christine Marjorie Karen
Eddie Florence Katie Stella Karen Marjorie Deborah Julia Christine Roberta Cynthia
James Stella Florence Marjorie Katie Cynthia Julia Roberta Deborah Christine Karen
John Marjorie Deborah Julia Christine Stella Florence Roberta Karen Cynthia Katie
Roberta Robert Travis Shane Benjamin David John James Barry Eddie Kenneth
Christine Robert Benjamin Barry Shane Kenneth John James David Travis Eddie
Cynthia John Barry Eddie David Benjamin Robert Kenneth Shane James Travis
Julia Kenneth James Barry Travis John Eddie Benjamin David Robert Shane
Stella Benjamin Shane Kenneth James Barry Eddie Travis Robert John David
Karen Shane Barry Robert John Kenneth David James Travis Benjamin Eddie
Marjorie Barry John Travis Kenneth David Robert Eddie Benjamin James Shane
Florence John James Benjamin Eddie David Kenneth Travis Shane Barry Robert
Deborah Barry Travis David Eddie Robert John James Benjamin Shane Kenneth
Katie John Benjamin Eddie Robert Barry Travis James Kenneth Shane David