Exam 2-14

1. A=1000+100*randn(1,2000);
   The variance of A can be computed as var(A,1).
   Write code to find variance, mean-squared value, and mean value.

2. (continue 1) Round the values to one decimal place.

3. (continue 1) Show that variance = (mean squared value)-(mean value squared)

4. Start with:
   clear all, A=100+10*randn(4000,1); B=100+10*randn(4000,1);
   Round all A and B values to one decimal place. No display.

5. Write code to count and display the number of times that $A_n=B_n$. Use NO loops.

6. Repeat 5 using for loop.

7. Write a function that will accept a numerical grade, and produce a letter grade, consistent with the SLU grading scale (on right).

A	93-100
A-	90-92.9
B+	87-89.9
B	83-86.9
B-	80-82.9
C+	77-79.9
C	73-76.9
C-	70-72.9
D	60-69.9
F	<60

8. Test your function with
   num=[95,91,88,85,81,78,75,71,65,55];

9. Find the solutions of $x^4-19x^3+126x^2-344x+320=0$

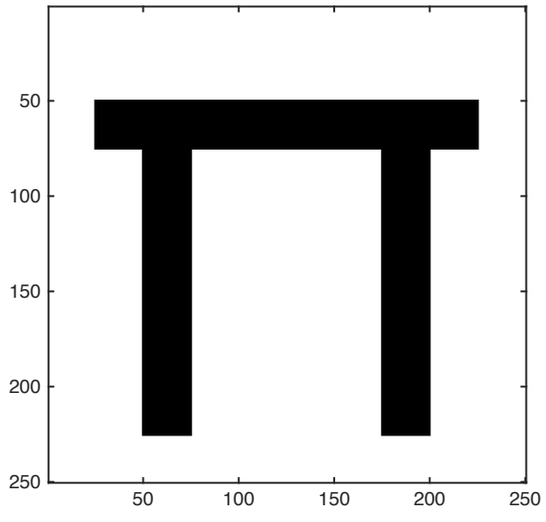
10. (continue 9) Write code to reverse the order of the coefficients, and find the solutions

11 (continue 10) Show that the solutions in 10 are the reciprocals of the solutions in 9.

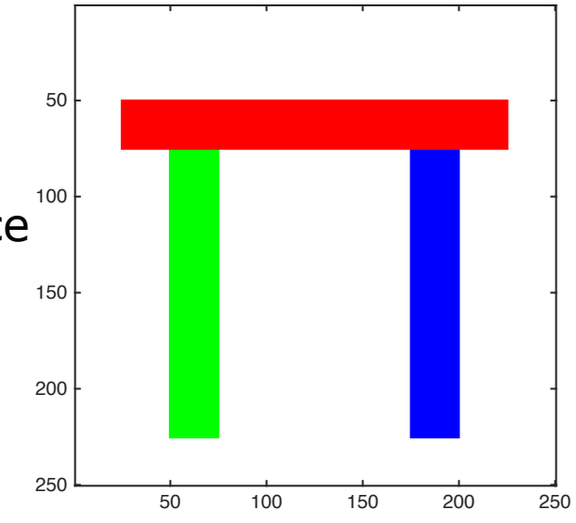
12. Integrate the polynomial in Problem 9, with limits of 0,10. Use anonymous function.

Note:
Any unnecessary display may result in deductions.
Any consultation with any living source will result in a grade of zero.
Any use of electronic communications during the exam will result in deductions.

13. Write code to produce this image.



14. Write your own colormap to produce this image.



15. Read noisy data using: clear all, d=data15;
The first column in d is time in seconds. The second column is height in meters.
Plot the data, with appropriate labels.

16. (continue 15) Write code to estimate the maximum height.
In other words, what would be the peak value in the absence of noise?

17. (continue 15-16) What is the time of the maximum?

18. Start with: [t,ecg]=data18; Plot ecg vs t, and label axes.

19. Find the time at the peaks of the three R-waves. Display the three values.

20. Compute Heart Rate as the reciprocal of the average time between consecutive R-waves.
Display the Heart Rate in beats per minute.

Send me your main script and your function in Problem 7.

Later, run this code:

```
clear all, close all, figure(2015)
c=[72,97,112,112,121,32]; y=fix(1e4/5)+ceil(14.5);
v=[char(c),num2str(y),char([32,33,33])];
text(0.06,0.6,v,'fontsize',48,'color',[1,0,0]), axis off
```