YAŞAR UNIVERSITY
MATH 2250 – Applied Linear Algebra, Fall 2019-2020

MATLAB ASSINGMENT

Date Given: 21.11.2019 **Due: 22.12.2019**

1-) **Plot Circles**

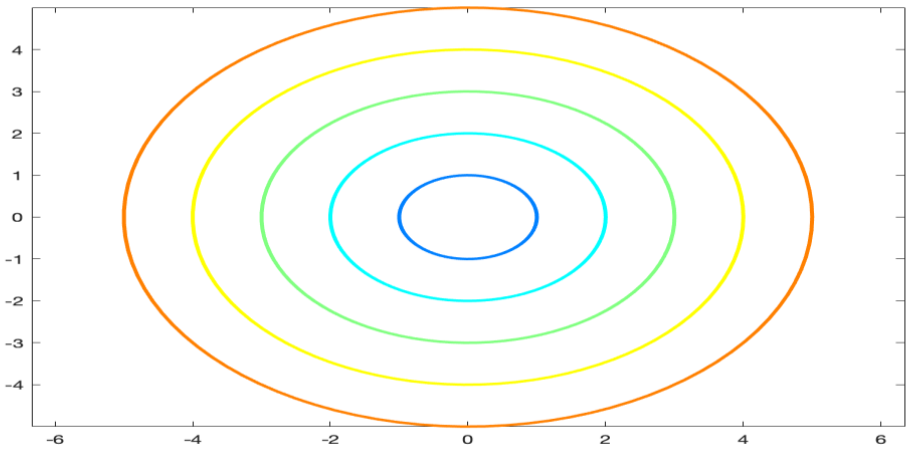
a-) Write MATLAB function called [x,y]=createCircle(*center,r*). The circle should be centered at *center (1x2 row vector).* Return x and y coordinates of the circle and then plot the circle. Remember that for a circle at origin (0,0) following equation is true

$x(t) = \cos(t)$

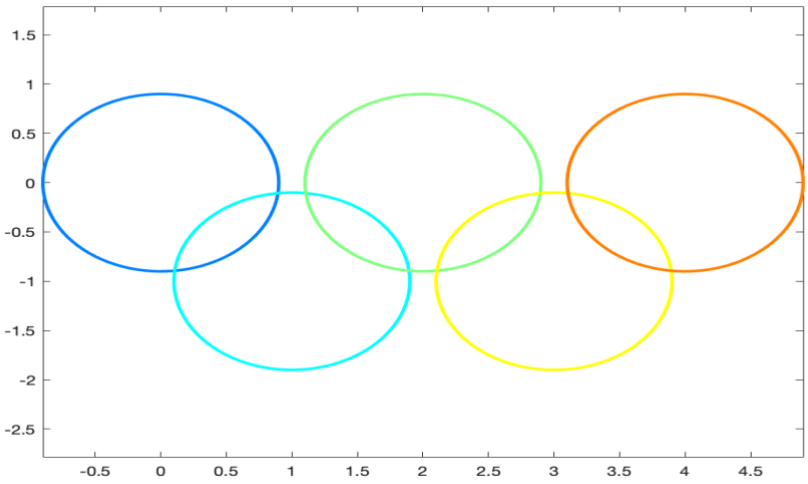
$y(t) = \sin(t)$ for $t = [0, 2\pi]$.

Now, you need to find out how to scale and translate the circle.

b-) Write a MATLAB script called circles.m and plot five (5) circles. All circles should be centered at the origin and have increasing radius. Set the LineWidth for each circle to 3. Your result should look like this.



c-) Write a Matlab script called olmypic_rings.m which you are expected to draw olympic symbol. Do not worry about making it look like exactly the same.



2-) **Stock Exchange** -Write following function in MATLAB

```
finalValue = stockExhance(initialValue,price,buy,sell)
```

You are given a data file which includes market values of a company called SRV. This file includes vector called prices which is weekly price of SRV's stock market value and also two additional vectors buy and sell. Buy provides indices to the price vector when stock value is low, sell provides indices to the price vector when stock value is high. Your task is to write function that buys stocks when it is low and sell stocks when it is high. Below is a list of guidelines.

i. The inputs of the function are :
- **initial_amount** – the amount of money you start investing,
- **price** – vector of weekly prices,
- **buy** – a vector indicates when to buy (just integer indices),
- **sell**- a vector when to sell (jusy integer indices).
- **finalValue** is the return values of a function which is amount of money you end up with.

ii. If all of your stock is not sold at the end. Use the last price of stock to calculate the how much your stock is worth and add it to the your cash. Make function generic so that it can work with any given amoınt,price,buy,sell.

iii. You can only buy integer amount of stocks. You cannot buy more stock than you can afford. When you making purchase you should also consider the transaction cost so you do not go to negative cash. When buying, buy as many stocks as you can, and when selling, sell them all.

iv. Each buy or sell transaction costs you 9.95₺, do not forget to implement this in your function.

v. Finally, test your function with different invesment amounts. Load the data file and call your function. To check whether your function work right or not. Below you can see outputs with different initial invesment values (100, 10.000, 100.000, 1.000.000)

```
With an initial investment of 100 TL, the final value is 100
With an initial investment of 10000 TL, the final value is 5989516.54
With an initial investment of 100000 TL, the final value is 61244428.5
With an initial investment of 1000000 TL, the final value is 613809792.58
```

Above scenario is valid if multiple stock buy/sell is considered as one transaction. Below I added new output if multiple stock buy/sell is considered as multiple transcation. You can choose whichever you want. I will accept both scenarios.

```
With an initial investment of 100 TL, the final value is 100
With an initial investment of 10000 TL, the final value is 57571.48
With an initial investment of 100000 TL, the final value is 580039.48
With an initial investment of 1000000 TL, the final value is 5804238.96
```

Good Luck ☺

Deliverables:

- createCircle.m
- circles.m
- Olympic_ring.m
- stockExhance.m

Assignment Rules:

1. In this lecture's homework, there are no cheating allowed. If any cheating has been detected, they will be **graded as 0** and there will be no further discussion on this.
2. You are expected submit individually. Group works are not allowed.
3. Make sure you submit your homework as an **MATLAB/OCTAVE file(.m)**.

4. Submit your homework through **SAKAI**.

Name and your assignment as the given format below:

MATH2250_ID_HW.zip