Recitation Class 05 for VG101

Date: 2012 / 10 / 22

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lab feedback & announcement

- LAB 03
  - Check the announcement everyday
  - No honor code violation based on the result

- Announcement
  - HWK03 due soon!
  - Who mistook the socket =_=
  - Download VS2010
  - Who forgot the signature?
  - Who forgot to submit your paper?

Mid-term 01

- Very difficult (far more challenging than before)
- Keep fighting
- This is only a beginning
- But still possible to get 60% of the full points
  - Start from the easiest one for you
  - Separate it to several sub-questions
  - Draft (pseudo-code) will be helpful
  - Comments are important

Mid-term 01

- Grader

No.	Grader
01	Yang Shuo
02	Wang Qian
03	Zhang Huajun / Luo Jiaxi

- If you still have problems or questions, please feel free to contact with us.

Explanation

- Key points

No.	Points
01	string + conditional branching structure + loop structure + vector + basic built-in function
02	conditional branching structure + loop structure + vector + basic knowledge in math
03	graphics + conditional branching structure + loop structure

Explanation

- Fall 2012 Problem 1
  - How to load data from a file? Already provide you the code.
    - Do you put your data file and your m file together in one folder?
  - How to determine the operation?
    - switch statement
    - if statement + strcmp() (instead of "==")
  - How to find maximum / minimum / average number?
  - How to find first month above / below average?
    - built-in function: max() / min() / mean() / sum() / find
    - for loop + if statement

Explanation

- Fall 2012 Problem 2
  - What does the last sentence suggest us?
    - "between 1 and 2 with an accuracy of two digits after decimal point"
  - How to approach the solution?
    - What does "fits the data values best" mean?
    - How to determine a variable to represent this fitness?
  - Enumerate and check the mean square deviation
    - built-in functions: min() / sum() / polyfit() / reshape()
    - for loop + if statement
  - Or use the following equation directly
    - $a = \sum xy / \sum x^2$

Explanation

- Fall 2012 Problem 3
  - It is difficult, but more correctly, complicated.
  - Focus on the eight requirements to solve it gradually.
    - The radius of the ball is 1.   x = cos(theta); y = sin(theta);
    - Arbitrary color.   fill(x,y,'r');
    - The size of the axis.   axis([-10 10 -10 10]);
    - Random speed.   vx = rand();
    - Relation between two directions. vy = vx * 1.5;
    - Reflect when hitting the ball.   Discuss later.
    - Never stop.   while (1) … end
    - Update 20 times per second.   pause(1/20);
  - These will weight 25 points out of 40!

MATLAB and math

- Symbolic variables:
  - syms x y z m n t;
- Limit:

  - limit('(1+1/n)^n',n,Inf) $\lim\limits_{n\to\infty}\left(1+\frac{1}{n}\right)^n$

  - limit('1/x',x,0,'left') $\lim\limits_{x\to 0^-}\frac{1}{x}$

  - limit('1/x',x,0,'right') $\lim\limits_{x\to 0^+}\frac{1}{x}$

  - limit('1/x',x,0) $\lim\limits_{x\to 0}\frac{1}{x}$

MATLAB and math

- Differentiation:
  - diff('sin(x)+cos(x)',x) $\qquad \frac{d}{dx}(\sin(x) + \cos(x))$

  - diff('log(x)',x,2) $\qquad \frac{d^2}{dx^2}\ln(x)$

- Integration:
  - int('1/(t*log(t))',t) $\qquad \int \frac{dt}{t \cdot ln(t)}$

  - int('1/x',x,0.5,1) $\qquad \int_{0.5}^{1} \frac{dx}{x}$

  - The length of one arch of cycloid (Calculus 5th ed. Pg.665)
    int('sqrt((diff(r*(t-sin(t)),t))^2+(diff(r*(1-cos(t)),t))^2)',t,0,2*pi)

MATLAB and math

- Easy plot:
  - ezplot('exp(x).^2 + log(y).^3 = tan(x).^3',[-100,0,-100,100])