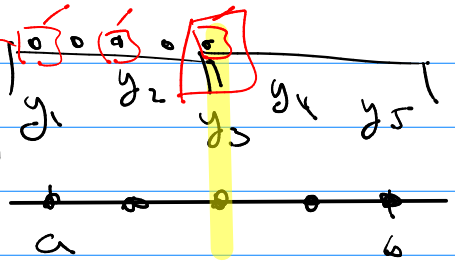
Math 451

Q's — Adapt. Quad

function [a x y] = adapt(f,a,b,dgb)

a: area; x's of entire quad.; y's of entire quad.



x = linspace(a,b,5)
x1 x2 x3 x4 x5

y = f(x)

Project 5 — calcbox ← Matlab/Octave Toolbox

Goals

(1) Documentation → Contents.m
→ your functions.m files

ex: function [a x y] = simpint(f,a,b,dg)

```
%
%  ?
%
```

help information

(2) Toolbox creation → directory ⊖ .m files in it.

(3) check your code. (if it any .m file does not work do not include it)

(4) report @ top say what you do not have.

Exam 3 — 6 in-class (6 take home

(comps = 100%)

Topics
1. systems of lin eqns
   Know: gauss (pivot)
   gauss-jordan
   gauss-backsolve
2. Interpolant → use gauss-backsolve on vandermond to find poly. interpolant → lagrange form
3. least squares data fitting
4. Adapt. Quad (Simp (trp)
5. recursion

Problems (In-class)

1. be able to write code for gauss-pivot, gauss-backsolve & gauss-jordan (comment/explain lines)
2. a) poly interpolant by script

ex given xd, yd as col. vectors of 25 points

$$\begin{bmatrix} & \\ & \\ & \\ & \end{bmatrix}$$

c ← coeff. of poly. interpolant of data

→ plot data (+) polynomial interpolant

(or)

b) given lagrange form function of polynomial interpolant. Comment/Explain the code

$$f(x) = \sum_{k=1}^{n} \prod_{j \neq k} (\quad)$$

(+) code you explain it.

(3) given some data. you write a script to give the least-squares polynomial of degree (k) and plot.

Ex3 Population from 2000 to 2010 was
150, 160, 163, 142, 130, 101
99, 91, 93, 87, 85

Find least-square fit of data with poly of degree 3. Plot.

(4) know adapt. quad for Simpsons.

(5) know adapt quad for trap but the algebra part for the better approx.

(6) recursion / non-recursion functions for a seq of numbers.

$a_1 = 1 \quad a_2 = 1$

1, 1, 2, 5, 14

$a_3 = 1 \cdot 1 + 1 \cdot 1 = 2$

$a_4 = 1 \cdot 2 + 1 \cdot 1 + 2 \cdot 1 = 5$

$a_5 = 1 \cdot 5 + 1 \cdot 2 + 2 \cdot 1 + 5 \cdot 1 = 14$

$p(\text{attri}) =$

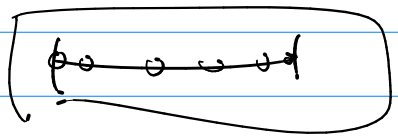
Take-Home 6 probs

(1), (2) Solve lin system & eqn's

(3) least squares example

(4) modified pdx. interpolant

(5) modified adapt quad



(6) recursion.

(6a) $\frac{y_1 + 8y_2 + 12y_3 + 8y_4 + y_5}{30}$