nmi : spring 2024 : quiz 04 : python, interpolation

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next week, math 385 and math 685 will have different questions but feel free to answer additional questions for extra credit. q6 and q7 are examples of next weeks math 685 quiz questions.

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q1. (5 pts **max**) there are five bugs in this python code. find **two** and explain why they are bugs.

```
import numpy as np

function f = lambda x: 2x +1

xs = np.linspace(0,1,11)
ys = f(xs)
y = f(12)
  print ys,y

plt.scatter(xs,ys)
plt.show()
```

q2. (5 pts) name a python library function that solves the system **Ax=b** and how to use it.

q3. (5 pts) if a method you want to use exists in both numpy and scipy, which one should you use and why?

q4. (5 pts) discuss the motivation for chebyshev roots.

q5. (5 pts) chebyshev roots are not equally spaced along the x-axis; what are they equally spaced along?

q6. (10 pts extra credit) give a **brief** outline or sketch of the proof for this units theorem six, chebyshev interpolation. oc, you may use " fact xx from the lecture notes".

q7. (10 pts extra credit) for a cubic spline, list all the unknowns for **n** points and where all the equations needed to solve them are sourced from.