Applied Computational Economics
Problem Set 0
Prologue on Numerical Solutions, Coding and Matlab

The University of Nottingham

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Q1 See the code PS0.m.

Q2 See the code PS0.m.

Q3 This is an interesting concept. Pseudo-random numbers are what a computer can generate for us. They're not really random in the sense that, conditional upon a seed, the numbers that are drawn subsequent will always be the same and appear in the same order. In the question, your 10×1 vector in step 2 should be the same as the first 10×1 vector you draw in step 5, (after you've re-set the seed). This is something we'll need to bear in mind later on when simulating artificial datasets.

Q4 See figure 1. The code PS0.m calls the function file myfun.m for this part. You'll need them both to be in the same directory for the call to work properly.

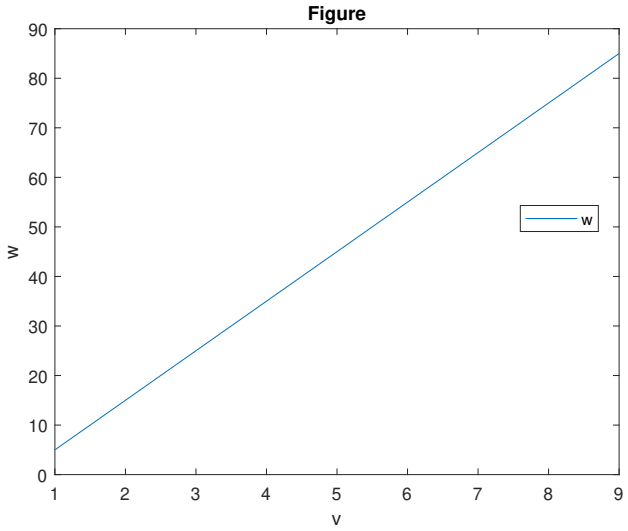

Figure 1: Figure for Q3

Q5 The analytical solution should just be $y(x) = \frac{x}{2}$, giving $f(x, y(x)) = \frac{x^2}{4}$. Go through the code from PS0.m line-by-line a few times to understand the differences here. The vectorised code

is definitely faster, but not to the degree that I was expecting before coding it up. The nested loops take 3.7 seconds versus the vectorised code that takes 2.6 seconds. Figure 2 shows the numerical solutions for $y^*(x)$ and $f(x, y^*(x))$.

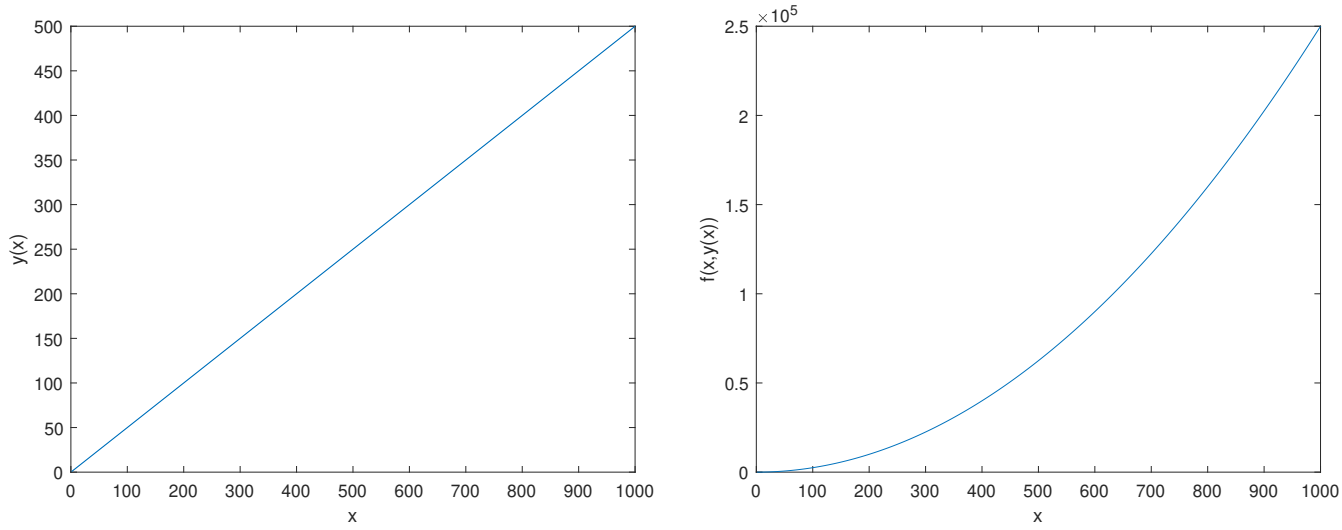

Figure 2: Numerical solutions for Q5