

## **Capstone Summary**

### **function\_1**

We are seeking to find two maxima of this function.

#### week1-5

First 3 points simple guesses - best point 0.5,0.5

#### week 6

Set up skopt with the Least common bounds estimator LCB and set kappa at 1.0

#### week7-9

Bounced about the corners of the domain without any real improvement

#### week11-13

changed kappa to zero - prioritized exploitation n over exploration.

Slight improvement.

#### Week 14 -

changed kappa back to 0.1

best value 0.0023697618151689473

### **function\_2**

We are seeking to find the maxima of this function

#### week 1-5

Simple guesses - best guess 0.6954167327128791

#### week 6

Set up skopt with LCB set kappa to 1.0, using the default base estimator "GP"

#### week 6 - 10

Bounced about near the limits of the domain. no improvement

#### week 11-14

changed kappa to 0.1 do less exploring, but no improvement

### **function\_3**

#### week1-5

Attempted to work out the redundant dimension by permuting the values, of a single element.

#### week6

Set up Gaussian process, acquisition function as LCB , set kappa=1

#### week7-10

best value = -0.0017902770546808788

#### week 11-15

no real improvement

### **function\_4**

#### week1-3

Guessed the points for the first 3 weeks- best -3.754695676825303

week 4

set up Gaussian EI acquisition function with  $\xi=0.1$

week5-10

no improvement

week11

Switched from the default "GP" to regular defined Gaussian processor aggressor.

week11-15

no significant improvement

## **function 5**

week1-5

guessed the points

week 6

Set up Gaussian LCB acquisition function with  $\kappa=1.0$

**week 7 - week10**

no significant improvement

week11

changed  $\kappa$  to 0.1

week 12 - week 14

No significant improvement.

## **function 6**

week1 - week 5

Guessed the points best guess -0.6974609336778691

week 6

add the GP with LCB,  $\kappa=1.0$

week7 - week 14

no significant improvement

## **function\_7**

week1- week5

Guessed the points

week6

Set up the GP with default "GP" and LCB and  $\kappa=1.0$

week7 - week 9

no significant improvement

week 10

Tweaks to  $\kappa$  and length scale

week11-14

no significant improvement

## **function\_8**

week1 to week5

Guessed the points best guess 9.942722150418

week6

Set up GP with "EI" and  $\xi=0.1$

week6-week8

no real improvement

Week 9-14

played with the length scale and the nu value but no real improvement