Exercises

1. What is the role of second derivative function in Gradient Descent method?

Second derivatives are used to understand the rate of change of derivatives.

1. Explain invHess() in Newton.py, in line manner.

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| **Code** | **Description** |
| df11 = 1200\*np.square(x[0])-400\*x[1]+2 | 2nd derivative respective to x[0] |
| df12 = -400\*x[0] | 1st derivative respective to x[0] then x[1] |
| df21 = -400\*x[0] | 1st derivative respective to x[1] then x[0] |
| df22 = 200 | 2nd derivative respective to x[1] |
| hess = np.array([[df11,df12],[df21,df22]]) | Declare the hessian matrix |
| return np.linalg.inv(hess) | Inverse the matrix then return the value. |

1. Calculate the time utilized to run both Gradient Descent method and Newton method when start is set to [5, 5].
2. What are the initial observations from the both results obtained when start is set to [5, 5]?
3. If start is set to [15, 15], rerun both methods. What are the observations now?
4. Compare and contrast between Gradient Descent method and Newton method.