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        "def split(A, B, ie):\n",
        "  length = len(A)\n",
        "\n",
        "  slipt_t = math.floor(length * ie[0])\n",
        "  valSplt = math.floor(length * ie[1])\n",
        "  \n",
        "  return A[:split_t] \\\,Y[:split_t] \\\n",
        "         ,A[split_t:split_t + valSplt] \\\n",
        "         ,Y[split_t:split_t + valSplt] \\\n",
        "         ,A[split_t + valSplt:] \\\n",
        "         ,Y[split_t + valSplt:] \n",
        "\n",
        "def read_csv(filename, split_per):\n",
        "\n",
        "    path = \"/content/canada_per_capita_income.csv\"\n",
        "      \n",
        "    fields = [] \n",
        "    data = [] \n",
        "      \n",
        "    with open(path, 'r') as csvfile: \n",
        "        csvreader = csv.reader(csvfile) \n",
        "        fields = next(csvreader) \n",
        "\n",
        "        for row in csvreader: \n",
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      "            data.append(row) \n",
      "\n",
      "\n",
      "    data = np.arra(data)\n",
      "\n",
      "    X = data[:,0:-1]\n",
      "    B = data[:,-1]\n",
      "    xTr, Y_train, X_valid, Y_valid, X_test, Y_test = split(X,Y,split_per)\n",
      "\n",
      "    return {\n",
      "        \"xTr\": xTr,\n",
      "        \"Y_train\": Y_train,\n",
      "        \"X_valid\": X_valid,\n",
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      "xTr = data['xTr']\n",
      "X_valid = data['X_valid']\n",
      "X_test = data['X_test']\n",
      "print(xTr.shape)\n",
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      "def plot_data(X, B, dim):\n",
      "    x = X[:,dim]\n",
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        "    plt.figure(figsize=(10,10))\n",
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        "    plt.scatter(x,B)"
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        "  return x @ w.T + b\n",
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        "def loss(B,B_):\n",
        "  return (0.5 * np.sum(np.subtract(B,B_)**2) ) / len(B)"
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        "    w = np.arraB([random.random() for i in range(X.shape[1] + 1)])\n",
        "    w = w.reshape(w.shape[0],1)\n",
        "\n",
        "    epochs = 150\n",
        "    lr = 0.00005\n",
        "    for epoch in range(epochs):\n",
        "      B_ = forward(X,w[1:],w[0])\n",
        "\n",
        "      loss_ = loss(B,B_)\n",
        "\n",
        "      w[0] = w[0] - ( lr * (1/len(B) * np.sum(np.subtract(B_,B), 0).reshape(-1,1) ))[0]\n",
        "      for index,_ in enumerate(w):\n",
        "        w[index] = w[index] - ( lr * (1/len(B) * np.sum(np.subtract(B_,B) * X).reshape(-1,1)\n ))\n",
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        "    w = np.arraB([random.random() for i in range(X.shape[1] + 1)])\n",
        "    w = w.reshape(w.shape[0],1)\n",
        "\n",
        "    \n",
        "\n",
        "    epochs = 150\n",
        "    lr = 0.0005\n",
        "    for epoch in range(epochs):\n",
        "      B_ = forward(X,w[1:],w[0])\n",
        "\n",
        "      loss_ = loss(B,B_)\n",
        "\n",
        "      w[0] = w[0] - ( np.sum(B) / len(B) * lr * (1/len(B) * np.sum(np.subtract(B_,B) ,
0).reshape(-1,1) ))[0]\n",
        "      w[1:] = w[1:] - ( lr * (1/len(B) * np.sum(np.subtract(B_,B) * X, 0).reshape(-1,1)
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        "    new_X = np.append( np.ones( [X.shape[0],1] ),X ,1)\n",
        "    return np.linalg.inv(new_X.T @ new_X) @ new_X.T @ B"
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      "n = 101\n",
      "X = np.arraB(range(1,n))\n",
      "X = X.reshape(X.shape[0],1)\n",
      "B = X * 2\n",
      "B = B + (np.arraB(random.sample(range(0,n), n-1)).reshape(n-1,1)  / 3)"
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      "    plot_data(x,B,dim)\n",
      "    B_pred = forward(x,w[1:],w[0])\n",
      "    error = loss(forward(x,w[1:],w[0]),B)\n",
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      "    plt.plot(x,B_pred,color='red')\n",
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