Introduction to DSP: Systems - Assignment

1. Write a python program to generate the plots for the following signals for values of time t from $-10s$ to $10s$.

   (a) $x(t) = u(t) + 2u(t) - u(t) - 2u(-t+1)$

   (b) $x(t) = e^{-t^2} \cos 2\pi t$

   (c) $x(t) = e^{-t}u(t)$

   (d) $x(t) = e^{-t}u(t) + e^{5t}u(-t)$

   (e) $x(t) = \cos(0.75\pi t) + 0.5 \sin(0.75\pi t)$

   (f) $x(t) = e^{-t} \sin(8\pi t + 0.23\pi)u(t)$

   (g) $x(t) = e^{-t}u(t) + e^{-4t}u(t)$

2. Plot the exponential function $e^{\alpha t}$ for different values of $\alpha = \{-10, -1, -0.2, 0, 0.5, 1, 10\}$. Explain what happens to the function as α changes.