$V_{BE} = .8V \quad \alpha = .98 \quad \beta = \frac{.98}{.98-1} \quad V_{BE}$

$i_B = .02mA$

$i_C = 0.95mA$

$i_e = 0.97mA$

$i_C = .98 \times .97$

$.97 = i_B + .97$

$V_{BE} = V_B - V_E$

$.8V = 4 - V_E$

$V_E = 3.2V$

$V = IR$

$3.2 = i_E(3.3k\Omega)$

DC biasing.

$i_C = I_S \exp\left(\frac{v_{BE}}{V_T}\right)$

$i_B = \frac{i_C}{\beta} \qquad i_E = i_B + i_C$

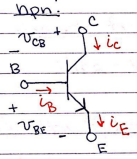
$i_C = \alpha i_E$

$\beta = \frac{\alpha}{\alpha - 1} \qquad \alpha = \frac{\beta}{\beta+1}$

active: $v_{BE} > 0$ and $v_{CB} > -0.4V$

- BJT Operation + DC Biasing:

npn:



$i_C = I_S \exp\left(\frac{v_{BE}}{V_T}\right)$

$i_B = \frac{i_C}{\beta} \qquad i_E = i_B + i_C$

$i_C = \alpha i_E$

$\beta = \frac{\alpha}{\alpha - 1} \qquad \alpha = \frac{\beta}{\beta+1}$

→ active: $v_{BE} > 0$ and $v_{CB} > -0.4V$