

ALGORYTMY KWANTOWE
Lista nr 6

1. Niech $|+\rangle = \frac{1}{\sqrt{2}}|0\rangle + \frac{1}{\sqrt{2}}|1\rangle$, $|-\rangle = \frac{1}{\sqrt{2}}|0\rangle - \frac{1}{\sqrt{2}}|1\rangle$. Dokonaj w bazie $\{|+\rangle, |-\rangle\}$ pomiaru kubitów $|\varphi\rangle$, gdzie
 - (a) $|\varphi\rangle = \frac{1}{\sqrt{2}}|0\rangle + \frac{e^{i\frac{\pi}{4}}}{\sqrt{2}}|1\rangle$
 - (b) $|\varphi\rangle = \frac{1}{\sqrt{2}}|0\rangle + \frac{1}{\sqrt{2}}|1\rangle$
 - (c) $|\varphi\rangle = \frac{1+i}{2}|0\rangle + \frac{1-i}{2}|1\rangle$
2. Niech $|\nearrow\rangle = \frac{1}{\sqrt{2}}|0\rangle + \frac{i}{\sqrt{2}}|1\rangle$, $|\searrow\rangle = \frac{1}{\sqrt{2}}|0\rangle - \frac{i}{\sqrt{2}}|1\rangle$. Dokonaj w bazie $\{|\nearrow\rangle, |\searrow\rangle\}$ pomiaru kubitów $|\varphi\rangle$, gdzie
 - (a) $|\varphi\rangle = \frac{1}{\sqrt{2}}|0\rangle + \frac{e^{i\frac{\pi}{4}}}{\sqrt{2}}|1\rangle$
 - (b) $|\varphi\rangle = \frac{1}{\sqrt{2}}|0\rangle + \frac{1}{\sqrt{2}}|1\rangle$
 - (c) $|\varphi\rangle = \frac{1+i}{2}|0\rangle + \frac{1-i}{2}|1\rangle$
3. Dokonaj obrotu kubitów $|\varphi\rangle$ o kąt θ , gdzie
 - (a) $|\varphi\rangle = |0\rangle$, $\theta = \frac{\pi}{4}$
 - (b) $|\varphi\rangle = \frac{1+i}{2}|0\rangle + \frac{1-i}{2}|1\rangle$, $\theta = \frac{\pi}{3}$
 - (c) $|\varphi\rangle = \frac{1}{\sqrt{2}}|0\rangle + \frac{1}{\sqrt{2}}|1\rangle$, $\theta = \frac{\pi}{2}$
4. Opisz CHSH Game w klasycznej formie
5. Opisz CHSH Game w wersji kwantowej