

CPSC-637 Complexity Theory

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Assignment # 3

(Due March 7)

1. VPP and BPP Recall that a problem Q_V is in VPP if there is a randomized algorithm A_V that (V1) on a yes-instance of Q_V , returns “yes” with probability δ , and (V2) on a no-instance of Q_V , returns “no” with probability 1 (where $\delta > 0$ is a fixed constant); and that a problem Q_B is in BPP if there is a randomized algorithm A_B that (B1) on a yes-instance of Q_B , returns “yes” with probability $2/3$, and (B2) on a no-instance of Q_B , returns “no” with probability $2/3$.

Give a formal proof that $VPP \subseteq BPP$.

2. We have described a proof that $NP \subseteq PP$ in class. Write a formal and detailed proof for this result.