Problem

Prove that if A ? P, then P^A = P.

Step-by-step solution

Step 1 of 1

Given:

Language *A* belongs to the polynomial type oracle Turing machine *P*.

$A \in P$

Proof:

P^A, is basically the class of the language which is decidable with the polynomial Turing machine which uses language *A*.

Here, it is to be proved that $P^A = P$

Construction:

Language *A* is the device which checks whether the string *w* is the member of *A*.

Suppose string *w* contains the value $\{a^n b^n\}$ and user has given the string $\{aabb\}$ then it is accepted by *A*. If the string $\{aabbb\}$ is specified then it is not expected by the language *A*.

Now, user checks this for the poly-time Turing machine:

Suppose *N* is the poly-time Turing machine, here, construction of the machine is done so that it can be proved that P^A, is basically the class of the language which is decidable with the polynomial Turing machine which uses language *A*.

• Computation path for *N* is done and it is found that it leads to the acceptance of the polynomial.

• If the string is accepted then yes query will execute if it is not accepted then no query will execute.

• Machine *N* checks whether all the string is accepted and rejected

• If the guess is right then string is accepted.

Here, for all the string computation is done and hence it is proved that $P^A = P$

Comment