Assignment - 3

The due date for submitting this assignment has passed. As per your request, you have not submitted this assignment.

Deutsch-Jozsa (DJ) algorithm assumes that we are given a system with discrete error level: a black box which is a quantum computer known as an oracle that implements some function with a restricted action.

For the implementation of the DJ, the function f maps n-digit binary values as input and produce either a 0 or a 1 as output for each such value. The produced result is the function's result for which the function is constant when:

- returns 0 for all the inputs
- returns 1 for half of the inputs
- returns 0 for half of the inputs
- returns 1 for all the inputs

When we implement DJ algorithm as a function, it results the fact the function is constant only if:

- (0) is a solution of (1) and (1) is a solution of (1)
- (0) is a solution of (1) and (1) is a solution of (1)
- (0) is a solution of (1) and (1) is a solution of (1)
- (0) is a solution of (1) and (1) is a solution of (1)

If not for the stated case of (1), the corresponding function would be the same as before

1 1
1 1
1 1
1 1

If CNOT gate is applied to the standard basis and its Hadamard basis, the following is true:

There is no connection to the two instances of the CNOT gate. CNOT gate would be the same in both the standard basis and the Hadamard basis. CNOT gate would be the same with the control and target qubits swapped in the Hadamard basis. In the Hadamard basis, CNOT gate cannot operate.

Oracle: A black box that you cannot see inside, and hence you don't know what it is actually doing and if it is a proper operation with some property that you don't have, and try finding out. Oracle is such an object from which you know that you can supply inputs and receive outputs. Oracle can be written in any valid form that defines a map from all possible inputs to outputs.

How can one define an "Oracle"?

Oracle is just a "black box" that you cannot see inside, and hence you don't know what it is actually doing and if it is a proper operation with some property that you don't have, and try finding out. Oracle is such an object from which you know that you can supply inputs and receive outputs. Oracle can be written in any valid form that defines a map from all possible inputs to outputs.

Grover's algorithm:

provides only a quadratic speedup
is probabilistic (in some sense); that it gives the correct answer with a probability of less than
is asymptotically optimal

In linear search, you always have to search all possible outcomes to find the correct answer. Grover’s algorithm’s asymptotic performance is better than linear search algorithms.

If a function is a pure quantum state but is a hybrid of classical and quantum processes to achieve prime factorization of a given number with an exponential speedup over classical counterparts. The efficiency of Shor’s algorithm is due to the efficiency of quantum algorithms to solve the ordered-finding problem that involves quantum Fourier transform and modular exponential by neural network parameters.

The extremely fast and efficient random number generation process.

All of the above

You have not answered.

Assignment: All of the above.

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