

English for Computer Science

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Passage 1

The term effective procedure is used to describe processes we intuitively understand as computable. An effective procedure consists of a finite set of instructions defining the operation of the procedure. The execution of an instruction is mechanical; it requires no cleverness or ingenuity on the part of the machine or person doing the computation. The operation of an effective procedure consists of sequentially executing a finite number of instructions and terminating. These properties can be summarized as follows. An effective procedure is a deterministic discrete process that halts for all possible input values. Computation in a DFA is clearly effective.

Passage 1

The preceding discussion of effectiveness is not a definition, just a compilation of properties attributed to algorithmic computation. Computability will be defined precisely in terms of the computations of another class of finite-state machines, the Turing machines.

A decision procedure is an effective procedure that determines whether the input satisfies a desired property. More succinctly, a decision procedure is a discrete, deterministic process that halts with output yes or no for every possible input. A question for which there is no decision procedure is called undecidable. To show that a property is undecidable, it is necessary to establish that no effective procedure can precisely identify the elements that satisfy the property.

16. For a given problem, ...

- 1) an effective procedure may or may not exist.
- 2) there always exists an effective procedure
- 3) there always exists a deterministic process halting on all possible input values
- 4) there always exists an effectively computable function

17- An effective procedure terminates ... input data.

- 1) some
- 2) all
- 3) discrete
- 4) at most one piece of

18- A problem for which ... is called undecidable.

- 1) a DFA exists
- 2) a Turing machine exists
- 3) there exists a procedure that does not halt on all input data
- 4) there does not exist procedure that halts on all possible input data

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19- A question for which a finite number of terminating instructions ... is called undecidable.

- 1) on all possible input data does not exist
- 2) with output yes on at least one input data does not exist
- 3) with output yes or no on all possible input data does not exist
- 4) on at least one input data does not exist

20- Choose the correct answer regarding (1) a decidable question and (2) an undecidable question.

- 1) Both have a decision procedure.
- 2) Neither has a decision procedure.
- 3) (1) has an effective procedure and (2) has no decision procedure.
- 4) Both can be decided by an effective procedure.

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Passage 2

The purpose of data compression is to reduce the length of the bit string representing the message. From the standpoint of information theory, a message is regarded as one of a collection of possible messages, with a probability distribution on the likelihood of different messages. Such probabilities can only be crudely estimated, either a priori or adaptively. The idea, then, is to assign shorter bit strings to more probable messages and longer bit strings to less probable messages, thus reducing the expected length of the representation. For example, with text, one can represent common letters in the alphabet (or common words in the dictionary) with a small number of bits and represent unusual letters or words with more bits. As another example, in an airline reservation system, the common messages have a very tightly constrained format (date, flight number, names, etc.) and thus can be very compactly represented, with longer strings for usual types of situations.

Passage 2

Data compression will be discussed more in Chapter 2 in the context of compressing control overhead. Data compression will not be treated in general here, since this topic is separable from that of data networks, and is properly studied in its own right, with applications both to storage and point-to-point communication.

Transforming message representation to facilitate communication, on the other hand, is a central topic for data networks. In subsequent chapters, there are many examples in which various kinds of control overhead must be added to messages to ensure reliable communication, to route the message to the correct destination, to control congestion, and so on. It will also be shown that transmitting very long messages as units in a subnet is harmful in several ways, including delay, buffer management, and congestion control. Thus messages represented by long strings of bits are usually broken into shorter bit strings called packets.

Passage 2

These packets can then be transmitted through the subnet as individual entities and reassembled into messages at the destination. The purpose of a subnet, then, is to receive packets at the nodes from sites outside the subnet, then transmit these packets over some path of communication links and other nodes, and finally deliver them to the destination sites. The subnet must somehow obtain information about where the packet is going, but the meaning of the corresponding message is of no concern within the subnet. To the subnet, a packet is simply a string of bits that must be sent through the subnet reliably and quickly.

21. The probability distribution on the occurrence of messages

- 1) are exactly known a priori
- 2) can only be approximated
- 3) are computed using distribution functions
- 4) can never be estimated

22. The length of message representation is expected to reduce if the assigned bit strings to more probable messages are . . . and the corresponding ones for less probable messages are

- 1) shorter/ longer
- 2) longer/ shorter
- 3) short/ long
- 4) long/ short

23. . . . plays a key role in data networks.

- 1) Extensive communication
- 2) Message transformation
- 3) Transmission of long messages
- 4) Detection of correct destinations

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24. Choose the correct sentence about packets.

- 1) Messages facilitating transmission of data
- 2) Compressed messages with no use at the destination
- 3) Reliable communication schemes for transfer of data
- 4) Transmitting broken messages that are reconstructed at the destination

25. A subnet . . .

- 1) is a medium in the network to compress data
- 2) is used to break messages into packets
- 3) carefully examines the content of a packet and immediately delivers it to the destination
- 4) disregards the content of the message and sends it to the destination as fast as possible

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In the following 5 questions, select the most appropriate selection.

26. To solve a problem, it is better to use . . . method.

- 1) a theoretical 2) a heuristic 3) an efficient 4) a complicated

27. To solve an ill-conditioned problem, . . . should be used.

- 1) a reliable computer 2) a stable algorithm
3) a closed form solution 4) an affordable algorithm

28. Over the years, the rise in computing power has

- 1) caused sever problems in physical sciences
2) caused ignorance of mathematics
3) led to the development of new algorithms for solutions of new problems
4) caused negligence of theoretical developments.

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1) discrete

2) continuous

3) aggregate

4) proper

30. Computer science is ... by its use of mathematical techniques for analysis of algorithms.

1) weakened

2) popularized

3) demoralized

4) strengthened

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END.

شماره سوال	گزینه صحیح	شماره سوال	گزینه صحیح
۱	۴	۲۶	۳
۲	۳	۲۷	۲
۳	۱	۲۸	۳
۴	۲	۲۹	۱
۵	۱	۳۰	۴
۶	۳	۳۱	۴
۷	۴	۳۲	۱
۸	۲	۳۳	۱
۹	۳	۳۴	۱
۱۰	۴	۳۵	۳
۱۱	۲	۳۶	۳
۱۲	۱	۳۷	۲
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۱۵	۳	۴۰	۴
۱۶	۱	۴۱	۲
۱۷	۲	۴۲	۴
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۱۹	۳	۴۴	۲
۲۰	۳	۴۵	۱
۲۱	۲	۴۶	۲
۲۲	۱	۴۷	۳
۲۳	۲	۴۸	۴
۲۴	۴	۴۹	۳
۲۵	۴	۵۰	۱