

- 1) What is reliable data transfer?
The ability to guarantee that a transmitted message was received, and it was received as it was sent (without errors).
- 2) What about RDT is indicated by the two-generals problem?
If there is any aspect of the communications channel, it is impossible to guarantee 100% reliable data transfer.
- 3) What are some aspects of reliable data transfer?
Error Detection, Receipt Acknowledgement, Timing, Fairness, Message Sequencing, Usage Fairness, ...
- 4) Theoretically, what is the maximum number of bytes that can be carried in the “application data” section of a UDP segment?
65,527 bytes. The “length” field of the UDP header is 16-bits, so the largest value it can hold is 65,535. The header is 8 bytes, which leaves 65,527 bytes for the “application data”. It would not be practical to send a segment of this size through the internet.
- 5) What aspects of RDT does the UDP protocol implement?
Only simple error detection.
- 6) (TCP and UDP use 16-bit sums to compute the checksum field. For this exercise, use 8-bit sums.) Given the following bytes:

	0	1	0	1	0	0	1	1
	0	1	1	0	0	1	1	0
1 st result	1	0	1	1	1	0	0	1
	0	1	1	1	0	1	0	0
2 nd result	1	0	0	1	0	1	1	0
								1
8-bit sum	0	0	1	0	1	1	1	0

- a. What is the 1's-complement of the sum of these bytes?

Switch 0's to 1's and vice-versa: 1 1 0 1 0 0 0 1

- b. If there is only one error bit in a segment, could it go undetected? How?

No. If we add the 8-bit sum and its 1's-complement, the result should be all 1's. The destination computes the sum, and adds the checksum from the source. If there are any zeros in the result, there is an error. All 1-bit errors would be detected.

- c. If there are 2 bits in error, could the errors go undetected? How?

2-bit errors could possibly go undetected. For example, if the last digit of the first number is converted to a 0 and the last digit of the second number is converted to 1, the sum would be the same.