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Data Communications

Lab 2

1.
 - a. Socket – The socket function is used to create a type of socket. For example, creating an int variable. The correct syntax would be `int sockfd = socket(domain, type, protocol);`. There are three arguments for the socket function. Domain would be the communication domain which is an integer, such as, `AF_INET` or `AF_INET6`. Type would be the communication type. Either `SOCK_STREAM` for TCP connections or `SOCK_DGRAM` for UDP connections. Lastly the protocol would be protocol value for the IP. The socket function returns an int, like a file- handle.
 - b. Bind – The bind function is used to bind the socket to the address and port numbers specified. The correct syntax would be `int bind(functobj, nums);` Where `functobj` would be the socket created, and `nums` would be the address and the port numbers being attached to the socket. The return type is a template based on the `functobj`.
 - c. Htons – The `htons` function is used to convert the passed argument from short host to a TCP/IP network byte order. The correct syntax would look like `uint16_t htons (uint16_t hostshort);` where the `hostshort` is passed host that is needed to be converted. The return value would be the network byte order of the conversion.
 - d. Recvfrom – The `recvfrom` function received data and stores the source address. The correct syntax would be `int recvfrom(sockfd, *buf, len, flags, *from, *fromlen)`. The `sockfd` is the created socket, `buf` is the incoming data, `len` is the length of the buffer in `buf`, `flags` is a set of options to modify behavior of the function, `from` is an optional pointer that will hold the source address upon return, and `fromlen` is an optional pointer to the size of the buffer from the `from` function. The return value will be the number of bytes received.
 - e. Sendto – The `sendto` function is used to send a message to a location. The correct syntax would look like `sendto(sockfd, *buf, len, flags, *to, tolen);` Where `sockfd` is the created socket, `buf` is the pointer containing the data being sent, `len` is the length of `buf`, `flags` is specific way in which the call is made, `to` is an optional pointer to the address of the target socket, and `tolen` is the size of the address pointed to in "to." The return value would be the total number of bytes sent.
 - f. Close - Close function is used to close the socket at the end of the program. The correct syntax looks like `close(sockfd);`. Where the argument passed is the socket that needs to be closed. The return type is void.
2. The loopback IP address is 127.0.0.1. This address allows the software to interface with the same machine as the software is running on, without the need for any other hardware and no network connection.