C socket API reference

Program Skeleton

```
#if defined WIN32
#include <winsock.h>
#else
#define closesocket close
#include <sys/socket.h>
#include <arpa/inet.h>
#include <unistd.h>
#include <netdb.h>
#endif

#include <stdio.h>
...

int main() {
...
        #if defined WIN32
        // Initialize Winsock
        WSADATA wsaData;
        int iResult =
           WSAStartup(MAKEWORD(2,2), &wsaData);
        if (iResult != 0) {
           printf("Error at WSAStartup()\n");
           return 0;
        }
        #endif
        int my_socket
...
        closesocket(my_socket);
        #if defined WIN32
           WSACleanup();
        #endif
        return 0;
} // main end
```

Data Structures

```
struct sockaddr {
        unsigned short  sa_family;
        char    sa_data[14];
};

struct sockaddr_in {
        unsigned short sin_family;
        unsigned short sin_port;
        struct  in_addr sin_addr;
        char    sin_zero[8];
};

struct in_addr {
        unsigned long s_addr;
};

struct hostent {
        const char *h_name;
        char **h_aliases;
        short h_addrtype;
        short h_length;
        char **h_addr_list;
};
```

Socket Setup

```
int socket(int pf, int type, int protocol );
int bind(int socket, struct sockaddr* localaddress, unsigned int addr_len);
```

Socket Connection

```
int connect(int socket, const struct sockaddr* addr, int addrlen);
int listen(int socket, int backlog);
int accept(int socket, struct sockaddr* addr, int* addrlen);
```

Socket Communication

```
int send(int socket, const char* buf, int len, int flags);
int sendto(int s, const char* buf, int len, int flags, const struct sockaddr_in* to,
           unsigned int to_len);
int recv(int socket, char* buf, int len, int flags);
int recvfrom(int s, char* buf, int len, int flags, struct sockaddr_in* from,
           unsigned int* from_len);
int closesocket (int socket); /* Windows */
int close (int socket);       /* Unix */
```

Name/Address Resolution

```
struct hostent *gethostbyname(const char *hostname);
struct hostent *gethostbyaddr(const char *struct_in_addr, int addr_len, int af_type);
```

Conversion functions

```
unsigned long inet_addr(const char* add); //dots-and-numbers string to unsigned long
char* inet_ntoa(struct in_addr in); //struct in_addr to a dots-and-numbers string
short int htons(short int hs); //host to network short
long int htonl(long int hl); //host to network long
short int ntohs(short int ns); //network to host short
long int ntohl(long int nl); //network to host long
int atoi (const char * str); //string to integer
char* itoa (int value, char* str, int base); //integer to string (non-standard function)
```