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RETI DI CALCOLATORI E INTERNET

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Docente: Ing. Alessandra De Paola
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Documentazione Programmazione Socket

```
//Structures for handling internet addresses
struct sockaddr_in { // ...
    short sin_family; // e.g. AF_INET, AF_INET6
    unsigned short sin_port; // e.g. htons(3490)
    struct in_addr sin_addr; // see struct in_addr };

struct in_addr{ unsigned long s_addr; //e.g. INADDR_ANY };

//Structure for handling host names
struct hostent{ // ...
    char *h_name; //The real canonical host name.
    int h_addrtype; //The result's address type, e.g. AF_INET
    int h_length; //The length of the addresses in bytes, which is 4 for IP (version 4) addresses.
    char *h_addr; //An IP address for this host. };

int socket(int domain, int type, int protocol); //allocates a socket descriptor

int accept(int sockfd, struct sockaddr *addr, socklen_t *addrlen);
//accepts an incoming connection on a listening socket

int bind(int sockfd, struct sockaddr *my_addr, socklen_t addrlen);
//associates a socket with an IP address and port number

int listen(int sockfd, int queuelength); //tells a socket to listen for incoming connections

int connect(int sockfd, const struct sockaddr *addr, socklen_t addrlen); //connects - initiate a connection on a socket

int close(int sockfd); //closes a socket descriptor

struct hostent *gethostbyname(const char *name); //gets an IP address for a hostname

//Functions to convert multi-byte integer types from host byte order to network byte order (and viceversa)
uint32_t htonl(uint32_t hostlong);
uint16_t htons(uint16_t hostshort);
uint32_t ntohl(uint32_t netlong);
uint16_t ntohs(uint16_t netshort);

//Functions to convert IP addresses to human-readable form and back
const char *inet_ntop(int af, const void *src, char *dst, socklen_t size);
int inet_pton(int af, const char *src, void *dst);

//Functions to convert IP addresses from the IPv4 numbers-and-dots notation into binary form (in network byte
order) and vice versa
int inet_aton(const char *cp, struct in_addr *inp);
char* inet_ntoa(struct in_addr in);

//Function that returns the current address to which the socket sockfd is bound, in the buffer pointed to by addr.
int getsockname(int sockfd, struct sockaddr *restrict addr, socklen_t *restrict addrlen);

ssize_t recv(int sockfd, void *buf, size_t len, int flags); //receives data on a stream socket
ssize_t send(int sockfd, const void *buf, size_t len, int flags); //sends data out over a stream socket
```



```
ssize_t recvfrom(int sockfd, void *buf, size_t len, int flags, struct sockaddr *src_addr, socklen_t *addrlen);  
// receives data on a datagram socket
```

```
ssize_t sendto(int sockfd, const void *buf, size_t len, int flags, const struct sockaddr *dest_addr, socklen_t addrlen);  
// sends data out over a datagram socket
```

```
ssize_t read (int fd, void *buf, size_t count); // reads data from a stream socket  
ssize_t write (int fd, const void *buf, size_t count); // writes data on a stream socket
```

Utility Functions

```
void bzero(void *s, size_t n); // sets the first n bytes of the area starting at s to zero  
void bcopy(const void *src, void *dest, size_t n); // copies n bytes from src to dest.
```

```
void* memset(void *s, int c, size_t n);  
// fills the first n bytes of the memory area pointed to by s with the constant byte c
```

```
void* memcpy(void *dest, const void *src, size_t n);  
// copies n bytes from memory area src to memory area dest. The memory areas must not overlap
```

```
int strcmp(const char *s1, const char *s2); // compares the two strings s1 and s2.  
int strncmp(const char *s1, const char *s2, size_t n); // compares the first n byte of s1 and s2.
```

```
char *strcat(char *dest, const char *src); // appends the src string to the dest string.  
char *strncat(char *dest, const char *src, size_t n);  
// appends the src string to the dest string, by using at most n bytes from src.
```

```
char *strcpy(char *dest, const char *src);  
// copies the string pointed to by src, including the terminating null byte, to the buffer pointed to by dest.
```

```
char *strncpy(char *dest, const char *src, size_t n);  
// copies the string pointed to by src, including the terminating null byte, to the buffer pointed to by dest, by using at most n bytes from src.
```

```
size_t strlen(const char *str); // calculates the length of the string str, excluding the terminating null byte.
```

```
int rand(void); // returns a pseudo-random number in the range of 0 to RAND_MAX.
```