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Atividade 2

Parte 2

Nesta parte foi retirada todas as partes que envolviam fork e utilizada em seu lugar o código fornecido pelo professor.

```
maxfd = s;
client_num = -1;
for (i = 0; i < FD_SETSIZE; i++)
  clients[i] = -1;

FD_ZERO(&all_fds);
FD_SET(s, &all_fds);


while (1) {
  new_set = all_fds;
  nready = select(maxfd+1, &new_set, NULL, NULL, NULL);
  if(nready < 0) {
    perror("select" );
    exit(1);
  }

  if(FD_ISSET(s, &new_set)) {
    len = sizeof(socket_address);
    /* aguardar/aceita conexão, receber e imprimir texto na tela, enviar eco */
       //(...)

    if ((new_s = accept(s, (struct sockaddr *)&socket_address, &len)) < 0) {
      printf("Error in accepting.\n");
      exit(1);
    }
    else {
      leng = sizeof(socket_address);

      if (getpeername(new_s, (struct sockaddr *)&socket_address, &leng) == -1)
        printf("ERROR\nCould not getsockname\n");
```

```
    else {
      printf("\nClient IP Address: %s\n", inet_ntoa(socket_address.sin_addr));
      printf("Client Port Number: %d\n\n", ntohs(socket_address.sin_port));
    }
  }
  for (i = 0; i < FD_SETSIZE; i++) {
    if (clients[i] < 0) {
      clients[i] = new_s;       //guarda descritor
      break;
    }
  }
  if (i == FD_SETSIZE) {
    perror("Numero maximo de clientes atingido.");
    exit(1);
  }
  FD_SET(new_s, &all_fds);             // adiciona novo descritor ao conjunto
  if (new_s > maxfd)
    maxfd = new_s;                     // para o select
  if (i > client_num)
    client_num = i;             // índice máximo no vetor clientes[]
  if (--nready <= 0)
    continue;                   // não existem mais descritores para serem lidos
}
for (i = 0; i <= client_num; i++) {     // verificar se há dados em todos os clientes
  if ( (sockfd = clients[i]) < 0)
    continue;
  if (FD_ISSET(sockfd, &new_set)) {
    if ( (len = recv(sockfd, buf, sizeof(buf), 0)) == 0) {
    //conexão encerrada pelo cliente
      close(sockfd);
      FD_CLR(sockfd, &all_fds);
      clients[i] = -1;
    }
    else {
      /* imprime ip e porta do cliente e envia texto de volta */
      leng = sizeof(socket_address);
      if (getpeername(new_s, (struct sockaddr *)&socket_address, &leng) == -1)
        printf("ERROR\nCould not getsockname\n");
      else {
        printf("Client IP Address: %s\n", inet_ntoa(socket_address.sin_addr));
        printf("Client Port Number: %d\n", ntohs(socket_address.sin_port));
      }
      printf("Message: %s\n",buf);
      valid = write(sockfd,buf, MAX_LINE);
      if (valid <= 0) {
        printf("ERROR\nCould not write to socket\n");
        exit(1);
      }
    }
    if (--nready <= 0)
```

```
            break;
        }
    }
}
```

Funções utilizadas:

- **Select** : permite um programa a monitorar múltiplos arquivos descritores, o programa espera até que um ou mais descritores estejam prontos para alguma operação da classe E/S
- **FD_ZERO** : limpa um set
- **FD_SET** : adiciona valores para um determinado set
- **FD_ISSET** : testa para ver se um arquivo descriptor faz parte do set

Os testes feitos foram exatamente os mesmos que na parte 1, e as saídas foram exatamente as mesmas também.

Testes

Teste 1:

Server ->

Waiting for client connecttion...

Local IP Address: 143.106.16.60
Local Port Number: 48890

Local IP Address: 143.106.16.57
Local Port Number: 55760

Client IP Address: 143.106.16.60
Message: Oi sou a Luluzinha

Client IP Address: 143.106.16.57
Message: Oi sou o Jon!

Client IP Address: 143.106.16.57
Message: Que legal

ERROR
Could not read from socket
Client IP Address: 143.106.16.60
Message: OK cansei

ERROR
Could not read from socket
^C

Cliente 1 ->

Connected to server garfield.
Local IP Address: 143.106.16.60
Local Port Number: 48890
To end connection press 'Ctrl+C' .

Please enter a message: Oi sou a Luluzinha
ECO Responce from server:
Oi sou a Luluzinha

Please enter a message: OK cansei
ECO Responce from server:
OK cansei

Please enter a message: ^C

Cliente 2 ->

Connected to server garfield.
Local IP Address: 143.106.16.57
Local Port Number: 55760
To end connection press 'Ctrl+C' .

Please enter a message: Oi sou o Jon!
ECO Responce from server:
Oi sou o Jon!

Please enter a message: Que legal
ECO Responce from server:

Que legal

Please enter a message: ^C

Esse teste mostra dois clientes, com IPs diferentes, conectados a um mesmo server num terceiro IP.
As mensagens de "*ERROR Could not read from socket"* são referentes a quando algum dos clientes se desconecta do server.

Teste 2:

Server ->

Waiting for client connecttion...

Local IP Address: 143.106.16.55
Local Port Number: 34306

Local IP Address: 143.106.16.55
Local Port Number: 34310

Local IP Address: 143.106.16.55
Local Port Number: 34312

Local IP Address: 143.106.16.55
Local Port Number: 34314

Local IP Address: 143.106.16.55
Local Port Number: 34316

Client IP Address: 143.106.16.55
Message: oi sou o client 1

Client IP Address: 143.106.16.55
Message: oi sou o client 2

Client IP Address: 143.106.16.55
Message: oi sou o client 3

Client IP Address: 143.106.16.55
Message: oi sou o client 4

Client IP Address: 143.106.16.55
Message: oi sou o client 5

Client IP Address: 143.106.16.55
Message: o client 5 gosta de falar mais

ERROR
Could not read from socket
ERROR
Could not read from socket
ERROR
Could not read from socket
ERROR
Could not read from socket
ERROR
Could not read from socket

Client 1 ->

Connected to server garfield.
Local IP Address: 143.106.16.55
Local Port Number: 34310
To end connection press 'Ctrl+C' .

Please enter a message: oi sou o client 1
ECO Responce from server:
oi sou o client 1

Please enter a message: ^C

Client 2 ->

Connected to server garfield.
Local IP Address: 143.106.16.55
Local Port Number: 34312
To end connection press 'Ctrl+C' .

Please enter a message: oi sou o client 2

ECO Responce from server:
oi sou o client 2

Please enter a message: ^C

Client 3 ->

Connected to server garfield.
Local IP Address: 143.106.16.55
Local Port Number: 34314
To end connection press 'Ctrl+C' .

Please enter a message: oi sou o client 3
ECO Responce from server:
oi sou o client 3

Please enter a message: ^C

Client 4 ->

Connected to server garfield.
Local IP Address: 143.106.16.55
Local Port Number: 34316
To end connection press 'Ctrl+C' .

Please enter a message: oi sou o client 4
ECO Responce from server:
oi sou o client 4

Please enter a message: ^C

Client 5 ->

Connected to server garfield.
Local IP Address: 143.106.16.55
Local Port Number: 34306
To end connection press 'Ctrl+C' .

Please enter a message: oi sou o client 5

ECO Responce from server:
oi sou o client 5

Please enter a message: o client 5 gosta de falar mais
ECO Responce from server:
o client 5 gosta de falar mais

Please enter a message: ^C