! "# C $%&' () Brian W. Kernighan * Dennis M. Ritchie +, &-. /O12 C $%3456' (78&9: ; <=>?@ABCDEFGHI C $%&J KL; 356' (&M 78NOPM QRCST* UVWCXYZC[\] 56^_C`a]\bC^ _COS

56789: ;

ZMNOPQR6[

Prefac

?2>

@?2AB

! "#

56 &ngN- yz{ , - oOkRp7&Ep, wX&i %&qd[~ &i %&y
z{ - E' e%* &i %&O1UhdE' E* &l ; yz{ - Ee%&l ; O1UhdE
e%f \ < q%k' gy>?bO1Okv: i +

\>

\> **q** 1978 **]8**The C Programm

\#

C 1

Q? t z y z { b / Hvy4&MQ? t z Rd $n = n + 2$ PQ+ hw3f SM$

{ 7 X   cd] ce

dar , : R67(7+fi

    cc hello.c

B}I 56bUJ KABZpBLM<]"Tf 10. 32 O T (b) Tj /F2+2 10. 56

WCxy(3>W)ce@$56B: T^i

`#inc`

```
    upper = 300;
    step = 20;
    fahr = lower;
```

C(zZ['U'b@Jq$\+(S|^,@

cl @printf ``"12h[\8-KUw&[\OhNA3126[\% C $%568
r^CTj /&F2+2(%52'60. 55 5T6 10. 56 O TD (126) Tj _2+1 1

i $^

```
main()
{
    int fahr;

    for (fahr = 0; fahr <= 300; fahr = fahr + 20)
        printf("%3d %6.
```

%$=; t

```
        ++nc;
```

WdI – K4&

6$\b& 10 K?. SFz ndigit[0]Cndiglt[1]C} Cndigit[9]NA' (r,' (
)*9

ew switch $\ +, &$56&r - K= N] 6(

&{ #"% main [\8' U&@Bw power [\-j N

r ^/

RPcz2N' (h<\ C $%&aEz7. S(7I /O@

C2G VWXYZQ[\] ^

Z[* ^ [" 56 - . & • VM \ y \ ] @hi $\ ki Z[&n < 3STN&' (

`

u3<]'(r,k; <]6RZpB

```
int lower, upper, step;
```

WHAK[\"z ASCII

%r ^45: N6\''r , [\oThi &@Aj N?[\VGw• Nhi L\6\(
7l i xYkH@pBN\O

```
x *= y + 1
```

&/; "F2+

```
        z = b;
```

wOu a * b 8&n{ bN\L^} 8%R z 8@q/ UVWZ_ws?e•] B? :ᴄ[_

() [ ] -> .   ☽

C3G ePf

pBN%: R$\ 8i

```
   if (n > 0)
      if (a > b)
         z = a;
      else
         z = b;

else $
```

QKSZd

K4cA@pBN%: R$\8i

```
while ((c = getchar()) == ' ' || c == '\n' || c = '\t')
    ;   /* skip white space characters */
```

{ 4\45: N_w goto $\&56=NM_w goto $\&56=*

```
/* stri
```

●0

(1

V getop Gw&[↘

' ❨%

```
double pop(void) { ... }
```

?KN% push] pop A• K[\ 8M) (7

4.5.

%J S&' ()• 8 - K 3 ^ @

%M (7WW' ( ) & 45 : Nc. Z[* '' # Z[CLV' ( ) z 0NOI i Z[* $
%&Z[Z[

```
       char pattern[] = "ould ";
```
Cw:

"

```
#include < 1_ >
```

&7CLV1HCL**CLCLCL**

4.11.3. nNi j

q' (_wq/$\\, -. O(7XYN

```
ip = &x;            /* ip now points to x */
y = *ip;
```

5.2. .

in caller:

b:

a:

swap)

px:

py:

D 5-2

`a

td{

```
            return allocp - n; /* old p */
    } else      /* not enough room */
        return 0;
}

void afree
```

```
    if (allocbuf + ALLOCSIZE - allocp >= n) {  /* it fits */
```

(3

```
    if (p >= allocbuf && p < allocbuf + ALLOCSIZE)
```

&q/GH$\Ui `a• 3e• U(: 6

U| &`ae• OP+wST`at &pbe

z l

```
    {
        while (*s++ = *t++)
            ;
    }
```

$[\' uRyMSkt

}

U, [↘ getline &>1vw6n 1.9 2@

%$pB8N` a\b lineptr &hi " 4eO&M* QRi

char *lineptr[MAXLINES];

CU^ lineptr " – K! U MAXLINES K?. &– 5\bN48\

```
        temp = v[i];
        v[i] = v[j];
        v[j] = temp;
}
```
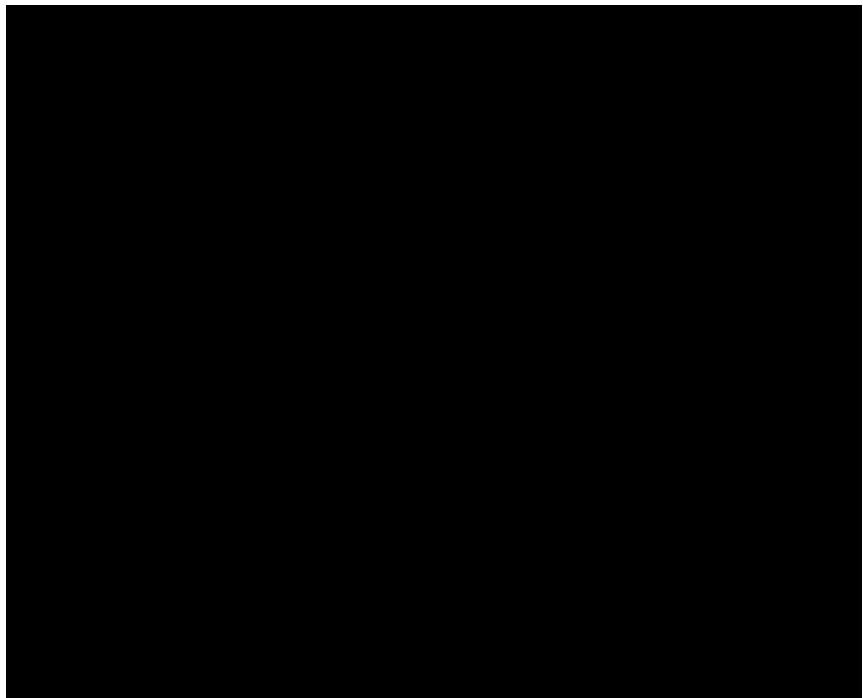
56 echo **&{ – K= L** argv **uc" – K<] ` a\ bi**

```
#include <stdio.h>

/* echo command-line arguments; 1st version */
```

, &56*, SF! w%J x acd7&%J

(cBM) * gWDF2e•] &Nwj &o; N\bncB&M) * &e•] @

I , d& qsort [\I t – . 0P\yS

```
int (*pf)
```

```
if (c == '(') {
    if ((c = getch()) == ')') {
        strcpy(token                    {
            "                    )                    ;

'                                                                        strcpy(token
```

```
                printf("invalid input at %s\n", token);
        }
        return 0;
}
```

LM 5-18   **TI** dcl **56N_CI**

w&n<NC(t MUQ6N;zr,W: 9Sd3'(\C((7S ^N

```
        p1.x += p2.x;
        p1.y += p2.y;
        return p1;
    }
```

48N[\&6*|}bC"^_ST@t T(yf L+gTN&^}pbx p1**NObU _wWW&^**

AVmWWw+X&^_c5@Aj N5' (w: B&mWl , WB&-7g' i

```
printf("origin is (%d,%d)\n",
```

```
    } keytab[NKEYS];
```

Chi I –

```
int binsearch(char *, struct key *, int);
```

```
   sizeof(; E_ )
```
L| } - K

LM 6

A_

! ; ` w5V, 8#OK4&. B@j N' (opl ' XY&7W\ (18[l ' &: >@

6.5.

C- =oO

typed

```
struct {
    char *name;
    int flags;
    int utype;
    union {
        int ival;
        float fval;
        char *sval;
    } u;
} symtab[NSYM];
```

' (r , : R$\ Ww4c5 ivali

```
flags |= EXTERNAL | STATIC;
```

C7G qr [q1

cd

: BaGH$[＼n=T&w8NTQΒ8xeI $[＼=~&MH@

: BaGH$[＼n=T&w8NTQΒ8xeI $[＼=~&MH@

MOWBA39: N' (vO&:) printf

B: T^i

```c
#include <stdio.h>

main()  /* rudimentary calculator */
{
    double sum, v;

    sum = 0;
    while (scanf("%l
```

+ f &%

7.8.3. ungetc

12h_[I - K\z ungetc &[\NC]

```
for (p = head; p != NULL; p = p->next) /* WRONG */
    free(p);
```

```
char c;

return (read(0, &c, 1) == 1) ? (unsigned char) c
```

' (_w: R$

\&v0ki BP

YW

```
#define stdin   (&_i
```

```
        return NULL;

    if (*mode == 'w')
        fd = creat(name, PERMS);
    else if (*mode == 'a') {
        if ((fd = open(name, O_WRONLY, 0)) == -1)
            fd = creat(name, PERMS);
        lseek(fd, 0L, 2);
    } else
```

```
/* opendir:  open a directory for readdir calls */
DIR *opendir(char *dirname)
{
    int fd;
    struct stat stbuf;
    DIR *dp;

    if ((fd = open(0.096 Tc (/ ) Tj0 -12 TD -1.056 Tn(n(0.096 Tc (/ ) Tj0 / ) r
```

(fd == (   ) Tj0 -12 TD ( ) Tj0 -12 TD -1r(fd..056 Tc (   ) _12 TD -1.056 T

O&`a@o

O&`a@o

}CbUde] "\(Y"S

}CbUde] "\(Y"S

uv' < C[P+ Z) OFNI

Ke•

J

B\ OC&QR! "O! ; &vONb char ST&

bU=; NR/u3U_?w&BUVW&bU=; @&5"kNo#e•]&=; 8ql
4E?\Mu-L=B

A.7.3

u

7j) #e•]

e•] !&E?\Ww"•3ST")`a@B}E?\i O

A.7.18 ✎

hi ki] ' ( ) hi] U opt;

' ( ) hi] U 8 & hi] 0 / V hi & 1 {] a hi ki] # - DR & ST * % J S ki] bc @

hi ki] i

% J S ki] hi ki] opt

ɓ]

ki i\hi z register ov-M| auto ST-.&\]&F2(7(•"#8&@
A"-K4mg&•\32 O₀ TD O Tc ((•") Tj /111. 12 758. 4 TD (

```
   s.left
```

Ww^_&^B>

I mki] i

enum **1{]** opt {**I m]**

`a

\]Nhi T D1 81{]&STzBSTTO] TON D&1{] ST"B| } T   D

T&[\&`a

```
    float y[4][3] = {

        1, 3, 5, 2, 4, 6, 3, 5, 7

    };
```

y &' b(^_P|O(No $y[0]$&' b bU(^_P|O(N; 6 $y[0]$&' ()L_ wU8&3K?. @w. N$y[1]$L_wdv&3K?. (7' ()N$y[2]$! 6S%@rcN : Rhi i

```
    float y[4][3] = {

        { 1 }, { 2 }, { 3 }, { 4 }

    };
```

L' () y &{ - RZL y ucz - KH5\b[

```
int *[3]

int (*)[]

int *()

int (*[])(void)
```

48& 6 **Khi SF6nI : RSTi** int (*

UVW 1a

A.10

B}-K\]"[\&• K

4[L<] ^[* <] D<Bb8&k; <] 6RZ6n

wODu1{]&, -. &=; @L#undef OD

, - . &q/i

if **79**

: RXY` 7i

A.12.10 (Aad)

hi U hi

hi ki] i i] i

'

sizeof **= ?**

/ F B 6 | }

TQ

tmpnam(NULL)**[\j G-K] OU9/nMw&<] DN\|}-K` 3-j . "#**
\b&` a@tmpnam(S)**[\/j G&<] D8%R\b** s **8N\LC&z[**

e@l U^L+X&6\M long " unsigned long ST'cl+ & 6 M longnglo

B.1.3 ~^cqr

scanf **[\-. >W) cdkH@**

int

ftell **[\|}** stream **Z&?c9/oUNe**

```
isalpha(c)    [\ isupper(c)" islower(c)z -
iscntrl(c)    c
```

```
void abort(void)

    abort [❯_56#D^12@4cl ] raise(SIGABRT)S*@

void exit(int status)

    exit [❯_56D^12@atexit [❯&GwR6]hV&R6+qNAV45: N
TUh9O&9/OQ  LV=3NTUh9O&ZLVᵛᵛ
```

long **ST&c5** quot ***** rem **8@**

B.6 **ef＿**

u

```
size_t strftime(char *s, size_t smax, co
```

SCHAR_MAX   +127

/FC"#$b

ı !

- **412i E` =I • 3STDb$%&n#bN\%• K! 9/ Z**<limits.h>*****
  <float.h>**[8xeI J**

%D

$

9greaterthanoperator r[{Oe•

addtreefunction**Z**addtree **[↘ [N**141

afreefunction**Z**~free **[↘ [** +102

alert character**N#**a**Z#**a **▌ ,]** **[N**38**N**

arithmetictypes **Z• 3ST[N** 196

way**N**ch **y** c **+Z<]** ↘**b[N**20**N**28**N**104

, ay decl~atnin**ZN ~at ni n**

208

assignmentoperator**N1ZS**!**pbe•]** [**N**50

assignment operato~**ZI Ybe•]** [**N**42**N**50**N**208

⟩ N

assignment statement**N**nes

backslash char~ter**NXZ##qrs][N**8**N**38

bell ch~aeter**ZI ,]N6**~alert cbar

C

calculatorprogram **Z(• &56[N**72**N**74**N**76**N**158

call by refe **: Zr, WwGw[N**27

call by value **ZabGw[N**27**N**95**N**202

eall~libraryfimcfion **Zca Za[\56 Tf 125.76 O TD (Z Tj /F2+2**

character s~ing **Z<] DN6n** string constant **[**

ch~acter testing funcBons **Z<] GH[` [N**166**N**

248

character**N**unsigned**Z[**   **] 6N**195j-276**[**-1

COROt qualifier**Z**conBt **1=] [NBN**

194**N**215

ennmeradontag**ZI m1 V[N**215

enumerationtype**ZI mST[N**196

e**}** em**zZ**T**ZI m] [N**194**N**215

EOF**Z**EOF**[N**16**N**151**N**242

equality operator**N**=a**Z**@**N5i e•] [N** i9**N**4i**N**

  207

equality operators**ZGpi e•] [N**41**N**207

equivalenc1r+3 10.56 TD (N) Tj/F6 10N

alen

fentl**N**h include file**Z**fcntl**N**h **OL9/** J**N**172

~eoflibraryfu

fprintf library function

if~ise statement**Z**if**P**else **$** [**N**19**ate**

initi

36N257

#lineZ#lineN233

NNNtCpHttpprogrineLitneN

250

- et library function **Z**memset **h[＼ [N**250

flame space $Zn<x$ [N227

}es length of $Z\#>K x$ [N35N192

negative subscripts Z b F 1 [N100

ne1to6a (s) Tj-0.096 Tcegasesub (s) Tj-0.096 lcega

opendir

pointer t

progr~1**N**fsize**Z**fsize **56**

putehar library function**Z**putchar~**{** ↘ **[N**15**N**

~moval ofdefinition**ZDu=; N6n**#under**[**

6 **N**

$ }

stxspn library f

subarray argument

tagNunionZ<o1V jN212

talloc fu56 Tf1Z.ta61l056I[Ix1IN642I0f I0.c56 0 T.on

tan l56 Tf10.56 0 TZtan-h6 IfIN2516 0 T.y fu56 Tf10.56 0 T.ncti56 Tf10.56 0

tanh 56 Tf10.56 0 T.liD f

vari