
HANDS-ON LAB 3

CS133C

INCLUDE FILE

The exercises in this (and subsequent labs) will make use of a standard include file named `defs.h` available from the instructor's web site. Download that file, copy it into the directory where you are saving your files for this lab, and include it using the following preprocessor statement:

```
#include "defs.h"
```

CONTROL FLOW

Like most languages, C has a set of control structures for conditional selection and looping. To complete this lab, you will need to know how to determine the extent of each construct. In a well-formatted program, extent is indicated by indentation. Reading a poorly-formatted program is difficult and error prone; the following exercises should convince you.

CONTROL FLOW 1

	Gussed output	Actual output
<pre>#include "defs.h"</pre>		
<pre>int main(int argc, char const *argv[]) { int x, y=1, z;</pre>		
<pre> if(y!=0) x=5; PRINT1(d,x);</pre>	_____	_____
<pre> if (y==0) x=3; else x=5; PRINT1(d,x);</pre>	_____	_____
<pre> x=1; if(y<0) if (y>0) x=3; else x=5; PRINT1(d, x);</pre>	_____	_____

```

if( z=y<0 ) x=3;
else if( y==0 ) x=5;
else x=7;
PRINT2(d,x,z);

if( z=(y==0) ) x=5;
x=3;
PRINT2(d,x,z);

if( x=z=y ); x=3;
PRINT2(d,x,z);

return 0
}

```

CONTROL FLOW 2

Gussed
output

Actual
output

```

#include "defs.h"

int main(int argc, char const *argv[])
{
    int x, y, z;

    x=y=0;
    while( y <10 ) ++y; x += y;
    PRINT2(d,x,y);

    x=y=0;
    while( y<10 ) x += ++y;
    PRINT2(d,x,y);

    y=1;
    while( y<10 ) {
        x = y++; z = ++y;
    }
    PRINT3(d,x,y,z);

    for( y=1; y<10; y++ ) x=y;
    PRINT2(d,x,y);

    for( y=1; (x=y)<10; y++ ) ;
    PRINT2(d,x,y);

    for( x=0,y=1000; y>1; x++,y/=10 )
        PRINT2(d,x,y);

    return 0;
}

```

CONTROL FLOW 3

Guessed
output

Actual
output

```
#include "defs.h"

#define ENUF 3
#define EOS '\0'
#define NEXT(i) input[i++]
#define FALSE 0
#define TRUE 1

char input[] = "PI=3.14159, approximately";

int main(int argc, char const *argv[])
{
    char c;
    int done, high, i, in, low;

    i=low=in=high=0;
    while( c=NEXT(i) != EOS )
        if( c<'0' ) low++;
        else if( c>'9' ) high++;
        else in++;
    PRINT3(d,low,in,high);

    i=low=in=high=0; done=FALSE;
    while( (c=NEXT(i))!=EOS && !done )
        if( c<'0' ) low++;
        else if( c>'9' ) high++;
        else in++;
        if( low>=ENUF || high>=ENUF || in>=ENUF )
            done=TRUE;
    PRINT3(d,low,in,high);

    i=low=in=high=0; done=FALSE;
    while( (c=NEXT(i))!=EOS && !done )
        if( c<'0' ) done = (++low==ENUF ? TRUE :
FALSE);
        else if( c>'9' ) done = (++high==ENUF ? TRUE
: FALSE);
        else done = (++in==ENUF ? TRUE : FALSE);
    PRINT3(d,low,in,high);

    return 0;
}
```


CONTROL FLOW 4

Guessed
output

Actual
output

```
#include "defs.h"

char input[] = "SSSWILTECH1\1\11W\1WALLMP1";

int main(int argc, char const *argv[])
{
    int i, c;

    for( i=2; (c=input[i])!='\0'; i++ ) {
        switch(c) {
            case 'a':    putchar('i'); continue;
            case '1':    break;
            case 1:      while( (c=input[++i])!='\1' && c!='\0' );
            case 9:      putchar('5');
            case 'E':
            case 'L':    continue;
            default:     putchar(c);
                       continue;
        }
        putchar(' ');
    }
    putchar('\n');

    return 0;
}
```

Guessed output:

Actual output: