

75.16 Lenguajes de Programación
Trabajo Práctico: Compilador de PL/0
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1. Objetivo

Implementar un compilador de PL/0 que encuentre errores y genere código ejecutable según se describe en el apunte de la cátedra.

2. Descripción del Compilador

El compilador fue implementado en Python[1]. Para dicha implementación, se realizaron 5 módulos:

- Analizador Léxico: Se encarga de hacer el análisis léxico, devolviendo tokens a medida que se van pidiendo lecturas del archivo fuente.
- Analizador Sintáctico: Se encarga de hacer el análisis sintáctico. El tipo de compilador implementado es de tipo *guiado por el parser*, por lo que será quien orqueste pidiendo los servicios del analizador sintáctico y semántico. Se basa en el grafo de sintaxis BNF[2] (o mejor dicho, el BNF-Extendido) del lenguaje de PL/0.
- Analizador Semántico: Se encarga de realizar el análisis semántico del archivo fuente. Almacena los identificadores en una tabla para analizar que los identificadores utilizados existan en el contexto indicado, y se utilicen de forma correcta según su tipo.
- Generador de Código: se encarga de transformar las distintas instrucciones en código ejecutable, dependiendo del sistema operativo utilizado.
- Compilador (llamado `comPiLad0r.py`): simplemente ejecuta el código de los demás módulos generando las conexiones entre éstos, y determinando el archivo fuente de origen, y la ruta destino.

En cada uno de los primeros 3 módulos, es importante recalcar que ante el primer error no se generará código¹, y se marcarán los errores en un archivo de salida, para poder realizar las correcciones correspondientes, tratando de ser dichos mensajes lo más explicativos posible.

2.1. Modo de ejecución

Para poder realizar la compilación, sólo es necesario tener instalado el intérprete de Python (que viene incluido en cualquier distribución de Linux).

Ejecutar el comando:

```
~$ ./comPiLad0r.py path/to/sourceFile path/to/execFile
```

En caso de no indicarse ruta (y nombre) del archivo ejecutable, tomará por defecto el nombre `ejec` (guardándose en el directorio actual).

¹Se crea un generador de código nulo, que no realiza operaciones, para no tener que llenar de condicionales el código.

3. Programas Correctos

3.1. BIEN-00

3.1.1. Código Fuente

```
var X, Y;

procedure INICIAR;
  const Y = 2;
  procedure ASIGNAR;
    X := Y;
  call ASIGNAR;

begin
  write ('NUM='); readln (Y);
  call INICIAR;
  writeln ('NUM*2=',Y*X)
end.
```

3.1.2. Contenido Hexadecimal Completo

0000000	457f	464c	0101	0001	0000	0000	0000	0000
0000010	0002	0003	0001	0000	8480	0804	0034	0000
0000020	0065	0000	0000	0000	0034	0020	0001	0028
0000030	0003	0001	0001	0000	0000	0000	8000	0804
0000040	8000	0804	050c	0000	050c	0000	0007	0000
0000050	1000	0000	2e00	6873	7473	7472	6261	2e00
0000060	6574	7478	0000	0000	0000	0000	0000	0000
0000070	0000	0000	0000	0000	0000	0000	0000	0000
0000080	0000	0000	0000	0000	0000	0000	0100	0000
0000090	0300	0000	0000	0000	0000	0000	5400	0000
00000a0	1100	0000	0000	0000	0000	0000	0100	0000
00000b0	0000	0000	0b00	0000	0100	0000	0600	0000
00000c0	e000	0480	e008	0000	2c00	0004	0000	0000
00000d0	0000	0000	0100	0000	0000	0000	0000	0000
00000e0	5152	5053	04b8	0000	bb00	0001	0000	e189
00000f0	01ba	0000	cd00	5880	595b	c35a	8955	81e5
0000100	24ec	0000	5200	5351	36b8	0000	bb00	0000
0000110	0000	01b9	0054	8d00	dc55	80cd	6581	f5e8
0000120	ffff	b8ff	0036	0000	00bb	0000	b900	5402
0000130	0000	558d	cddc	3180	50c0	03b8	0000	bb00
0000140	0000	0000	e189	01ba	0000	cd00	8180	e84d
0000150	000a	0000	36b8	0000	bb00	0000	0000	02b9
0000160	0054	8d00	dc55	80cd	5b58	5a59	ec89	c35d
0000170	04b8	0000	bb00	0001	0000	80cd	90c3	9090
0000180	0ab0	59e8	ffff	c3ff	3004	51e8	ffff	c3ff

```

0000190 003d 0000 7580 b04e e82d ff42 ffff 02b0
00001a0 e3e8 ffff b0ff e801 ffdc ffff 04b0 d5e8
00001b0 ffff b0ff e807 ffce ffff 04b0 c7e8 ffff
00001c0 b0ff e808 ffc0 ffff 03b0 b9e8 ffff b0ff
00001d0 e806 ffb2 ffff 04b0 abe8 ffff b0ff e808
00001e0 ffa4 ffff 3dc3 0000 0000 0b7d b050 e82d
00001f0 feec ffff f758 3dd8 000a 0000 8c0f 00ef
0000200 0000 643d 0000 0f00 d18c 0000 3d00 03e8
0000210 0000 8c0f 00b3 0000 103d 0027 0f00 958c
0000220 0000 3d00 86a0 0001 7b7c 403d 0f42 7c00
0000230 3d61 9680 0098 477c 003d f5e1 7c05 3d2d
0000240 ca00 3b9a 137c 00ba 0000 bb00 ca00 3b9a
0000250 fbf7 e852 ff30 ffff ba58 0000 0000 00bb
0000260 f5e1 f705 52fb 1de8 ffff 58ff 00ba 0000
0000270 bb00 9680 0098 fbf7 e852 ff0a ffff ba58
0000280 0000 0000 40bb 0f42 f700 52fb f7e8 fffe
0000290 58ff 00ba 0000 bb00 86a0 0001 fbf7 e852
00002a0 fee4 ffff ba58 0000 0000 10bb 0027 f700
00002b0 52fb d1e8 fffe 58ff 00ba 0000 bb00 03e8
00002c0 0000 fbf7 e852 febe ffff ba58 0000 0000
00002d0 64bb 0000 f700 52fb abe8 fffe 58ff 00ba
00002e0 0000 bb00 000a 0000 fbf7 e852 fe98 ffff
00002f0 e858 fe92 ffff 90c3 9090 9090 9090 9090
0000300 01b8 0000 bb00 0000 0000 80cd 9090 9090
0000310 00b9 0000 b300 5103 e853 fdde ffff 595b
0000320 0a3c 840f 0134 0000 7f3c 840f 0094 0000
0000330 2d3c 840f 0109 0000 303c db7c 393c d77f
0000340 302c fb80 7400 80d0 02fb 0c75 f981 0000
0000350 0000 0475 003c bf74 fb80 7503 3c0a 7500
0000360 b304 eb00 b302 8101 ccf9 cccc 7f0c 81a8
0000370 34f9 3333 7cf3 88a0 b8c7 000a 0000 e9f7
0000380 083d 0000 7480 3d11 fff8 7fff 1375 ff80
0000390 7e07 e90e ff7f ffff ff80 0f08 768f ffff
00003a0 b9ff 0000 0000 f988 fb80 7402 0104 ebc1
00003b0 2903 91c8 f888 5351 cbe8 fffd 5bff e959
00003c0 ff53 ffff fb80 0f03 4a84 ffff 51ff b053
00003d0 e808 fd0a ffff 20b0 03e8 fffd b0ff e808
00003e0 fcfc ffff 595b fb80 7500 b307 e903 ff25
00003f0 ffff fb80 7502 810f 00f9 0000 7500 b307
0000400 e903 ff11 ffff c889 0ab9 0000 ba00 0000
0000410 0000 003d 0000 7d00 f708 f7d8 f7f9 ebd8
0000420 f702 89f9 81c1 00f9 0000 0f00 e685 fffe
0000430 80ff 02fb 840f fedd ffff 03b3 d6e9 fffe
0000440 80ff 03fb 850f fecd ffff 2db0 5351 8de8
0000450 fffc 5bff b359 e902 febb ffff fb80 0f03
0000460 b284 fffe 80ff 02fb 0c75 f981 0000 0000

```

```

0000470 840f fea1 ffff e851 fd04 ffff 8959 c3c8
0000480 04bf 0485 e908 0017 0000 0ce9 0000 b800
0000490 0002 0000 8789 0000 0000 e8c3 ffef ffff
00004a0 b9c3 84b5 0804 04ba 0000 e800 fcc0 ffff
00004b0 05e9 0000 4e00 4d55 003d 51e8 fffe 89ff
00004c0 0487 0000 e800 ffc0 ffff deb9 0484 ba08
00004d0 0006 0000 97e8 fffc e9ff 0007 0000 554e
00004e0 2a4d 3d32 8b00 0487 0000 5000 878b 0000
00004f0 0000 f75b e8eb fc96 ffff 81e8 fffc e9ff
0000500 fd9c ffff 0000 0000 0000 0000
000050c

```

3.1.3. Listado Desensamblado de la sección *.text*

text/BIEN-00: formato del fichero elf32-i386

Desensamblado de la sección *.text*:

080480e0 <.text>:

```

...
8048480:      bf 04 85 04 08      mov     edi,0x8048504
8048485:      e9 17 00 00 00      jmp     0x80484a1
804848a:      e9 0c 00 00 00      jmp     0x804849b
804848f:      b8 02 00 00 00      mov     eax,0x2
8048494:      89 87 00 00 00 00    mov     DWORD PTR [edi+0x0],eax
804849a:      c3                   ret
804849b:      e8 ef ff ff ff      call    0x804848f
80484a0:      c3                   ret
80484a1:      b9 b5 84 04 08      mov     ecx,0x80484b5
80484a6:      ba 04 00 00 00      mov     edx,0x4
80484ab:      e8 c0 fc ff ff      call    0x8048170
80484b0:      e9 05 00 00 00      jmp     0x80484ba
80484b5:      4e                   dec     esi
80484b6:      55                   push    ebp
80484b7:      4d                   dec     ebp
80484b8:      3d 00 e8 51 fe      cmp     eax,0xfe51e800
80484bd:      ff                   (bad)
80484be:      ff 89 87 04 00 00    dec     DWORD PTR [ecx+0x487]
80484c4:      00 e8               add     al,ch
80484c6:      c0 ff ff           sar     bh,0xff
80484c9:      ff                   (bad)
80484ca:      b9 de 84 04 08      mov     ecx,0x80484de
80484cf:      ba 06 00 00 00      mov     edx,0x6
80484d4:      e8 97 fc ff ff      call    0x8048170
80484d9:      e9 07 00 00 00      jmp     0x80484e5

```

80484de:	4e	dec	esi
80484df:	55	push	ebp
80484e0:	4d	dec	ebp
80484e1:	2a 32	sub	dh,BYTE PTR [edx]
80484e3:	3d 00 8b 87 04	cmp	eax,0x4878b00
80484e8:	00 00	add	BYTE PTR [eax],al
80484ea:	00 50 8b	add	BYTE PTR [eax-0x75],dl
80484ed:	87 00	xchg	DWORD PTR [eax],eax
80484ef:	00 00	add	BYTE PTR [eax],al
80484f1:	00 5b f7	add	BYTE PTR [ebx-0x9],bl
80484f4:	eb e8	jmp	0x80484de
80484f6:	96	xchg	esi,eax
80484f7:	fc	cld	
80484f8:	ff	(bad)	
80484f9:	ff	(bad)	
80484fa:	e8 81 fc ff ff	call	0x8048180
80484ff:	e9 fc fd ff ff	jmp	0x8048300
...			

3.2. BIEN-01

3.2.1. Código Fuente

```

VAR BASE, EXPO, RESU;

PROCEDURE POT;
IF EXPO > 0 THEN
  BEGIN
    RESU := RESU * BASE;
    EXPO := EXPO - 1;
    CALL POT
  END;

BEGIN
  WRITE ('BASE: '); READLN(BASE);
  WRITE ('EXPONENTE: '); READLN(EXPO);
  RESU := 1;
  CALL POT;
  IF EXPO < 0 THEN RESU := 0;
  WRITELN ('RESULTADO: ', RESU);
  WRITELN
END.

```

3.2.2. Contenido Hexadecimal Completo

```

00000000 457f 464c 0101 0001 0000 0000 0000 0000
00000010 0002 0003 0001 0000 8480 0804 0034 0000

```


0000020	0065	0000	0000	0000	0034	0020	0001	0028
0000030	0003	0001	0001	0000	0000	0000	8000	0804
0000040	8000	0804	059a	0000	059a	0000	0007	0000
0000050	1000	0000	2e00	6873	7473	7472	6261	2e00
0000060	6574	7478	0000	0000	0000	0000	0000	0000
0000070	0000	0000	0000	0000	0000	0000	0000	0000
0000080	0000	0000	0000	0000	0000	0000	0100	0000
0000090	0300	0000	0000	0000	0000	0000	5400	0000
00000a0	1100	0000	0000	0000	0000	0000	0100	0000
00000b0	0000	0000	0b00	0000	0100	0000	0600	0000
00000c0	e000	0480	e008	0000	ba00	0004	0000	0000
00000d0	0000	0000	0100	0000	0000	0000	0000	0000
00000e0	5152	5053	04b8	0000	bb00	0001	0000	e189
00000f0	01ba	0000	cd00	5880	595b	c35a	8955	81e5
0000100	24ec	0000	5200	5351	36b8	0000	bb00	0000
0000110	0000	01b9	0054	8d00	dc55	80cd	6581	f5e8
0000120	ffff	b8ff	0036	0000	00bb	0000	b900	5402
0000130	0000	558d	cddc	3180	50c0	03b8	0000	bb00
0000140	0000	0000	e189	01ba	0000	cd00	8180	e84d
0000150	000a	0000	36b8	0000	bb00	0000	0000	02b9
0000160	0054	8d00	dc55	80cd	5b58	5a59	ec89	c35d
0000170	04b8	0000	bb00	0001	0000	80cd	90c3	9090
0000180	0ab0	59e8	ffff	c3ff	3004	51e8	ffff	c3ff
0000190	003d	0000	7580	b04e	e82d	ff42	ffff	02b0
00001a0	e3e8	ffff	b0ff	e801	ffdc	ffff	04b0	d5e8
00001b0	ffff	b0ff	e807	ffce	ffff	04b0	c7e8	ffff
00001c0	b0ff	e808	ffc0	ffff	03b0	b9e8	ffff	b0ff
00001d0	e806	ffb2	ffff	04b0	abe8	ffff	b0ff	e808
00001e0	ffa4	ffff	3dc3	0000	0000	0b7d	b050	e82d
00001f0	feec	ffff	f758	3dd8	000a	0000	8c0f	00ef
0000200	0000	643d	0000	0f00	d18c	0000	3d00	03e8
0000210	0000	8c0f	00b3	0000	103d	0027	0f00	958c
0000220	0000	3d00	86a0	0001	7b7c	403d	0f42	7c00
0000230	3d61	9680	0098	477c	003d	f5e1	7c05	3d2d
0000240	ca00	3b9a	137c	00ba	0000	bb00	ca00	3b9a
0000250	fbf7	e852	ff30	ffff	ba58	0000	0000	00bb
0000260	f5e1	f705	52fb	1de8	ffff	58ff	00ba	0000
0000270	bb00	9680	0098	fbf7	e852	ff0a	ffff	ba58
0000280	0000	0000	40bb	0f42	f700	52fb	f7e8	fffe
0000290	58ff	00ba	0000	bb00	86a0	0001	fbf7	e852
00002a0	fee4	ffff	ba58	0000	0000	10bb	0027	f700
00002b0	52fb	d1e8	fffe	58ff	00ba	0000	bb00	03e8
00002c0	0000	fbf7	e852	febe	ffff	ba58	0000	0000
00002d0	64bb	0000	f700	52fb	abe8	fffe	58ff	00ba
00002e0	0000	bb00	000a	0000	fbf7	e852	fe98	ffff
00002f0	e858	fe92	ffff	90c3	9090	9090	9090	9090

```

0000300 01b8 0000 bb00 0000 0000 80cd 9090 9090
0000310 00b9 0000 b300 5103 e853 fdde ffff 595b
0000320 0a3c 840f 0134 0000 7f3c 840f 0094 0000
0000330 2d3c 840f 0109 0000 303c db7c 393c d77f
0000340 302c fb80 7400 80d0 02fb 0c75 f981 0000
0000350 0000 0475 003c bf74 fb80 7503 3c0a 7500
0000360 b304 eb00 b302 8101 ccf9 cccc 7f0c 81a8
0000370 34f9 3333 7cf3 88a0 b8c7 000a 0000 e9f7
0000380 083d 0000 7480 3d11 fff8 7fff 1375 ff80
0000390 7e07 e90e ff7f ffff ff80 0f08 768f ffff
00003a0 b9ff 0000 0000 f988 fb80 7402 0104 ebc1
00003b0 2903 91c8 f888 5351 cbe8 fffd 5bff e959
00003c0 ff53 ffff fb80 0f03 4a84 ffff 51ff b053
00003d0 e808 fd0a ffff 20b0 03e8 fffd b0ff e808
00003e0 fcfc ffff 595b fb80 7500 b307 e903 ff25
00003f0 ffff fb80 7502 810f 00f9 0000 7500 b307
0000400 e903 ff11 ffff c889 0ab9 0000 ba00 0000
0000410 0000 003d 0000 7d00 f708 f7d8 f7f9 ebd8
0000420 f702 89f9 81c1 00f9 0000 0f00 e685 fffe
0000430 80ff 02fb 840f fedd ffff 03b3 d6e9 fffe
0000440 80ff 03fb 850f fecd ffff 2db0 5351 8de8
0000450 fffc 5bff b359 e902 febb ffff fb80 0f03
0000460 b284 fffe 80ff 02fb 0c75 f981 0000 0000
0000470 840f fea1 ffff e851 fd04 ffff 8959 c3c8
0000480 8ebf 0485 e908 0048 0000 878b 0004 0000
0000490 b850 0000 0000 395b 7fc3 e905 0031 0000
00004a0 878b 0008 0000 8b50 0087 0000 5b00 ebf7
00004b0 8789 0008 0000 878b 0004 0000 b850 0001
00004c0 0000 935b d829 8789 0004 0000 b9e8 ffff
00004d0 c3ff e6b9 0484 ba08 0006 0000 8fe8 fffc
00004e0 e9ff 0007 0000 4142 4553 203a e800 fe1e
00004f0 ffff 8789 0000 0000 0cb9 0485 ba08 000b
0000500 0000 69e8 fffc e9ff 000c 0000 5845 4f50
0000510 454e 544e 3a45 0020 f3e8 fffd 89ff 0487
0000520 0000 b800 0001 0000 8789 0008 0000 57e8
0000530 ffff 8bff 0487 0000 5000 00b8 0000 5b00
0000540 c339 057c 0be9 0000 b800 0000 0000 8789
0000550 0008 0000 68b9 0485 ba08 000b 0000 0de8
0000560 fffc e9ff 000c 0000 4552 5553 544c 4441
0000570 3a4f 0020 878b 0008 0000 11e8 fffc e8ff
0000580 fbfc ffff f7e8 fffb e9ff fd72 ffff 0000
0000590 0000 0000 0000 0000 0000
000059a

```

3.2.3. Listado Desensamblado de la sección *.text*

text/BIEN-01: formato del fichero elf32-i386

Desensamblado de la sección *.text*:

080480e0 <.text>:

...

8048480:	bf 8e 85 04 08	mov	edi,0x804858e
8048485:	e9 48 00 00 00	jmp	0x80484d2
804848a:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
8048490:	50	push	eax
8048491:	b8 00 00 00 00	mov	eax,0x0
8048496:	5b	pop	ebx
8048497:	39 c3	cmp	ebx,ebx
8048499:	7f 05	jg	0x80484a0
804849b:	e9 31 00 00 00	jmp	0x80484d1
80484a0:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
80484a6:	50	push	eax
80484a7:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
80484ad:	5b	pop	ebx
80484ae:	f7 eb	imul	ebx
80484b0:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
80484b6:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
80484bc:	50	push	eax
80484bd:	b8 01 00 00 00	mov	eax,0x1
80484c2:	5b	pop	ebx
80484c3:	93	xchg	ebx,ebx
80484c4:	29 d8	sub	eax,ebx
80484c6:	89 87 04 00 00 00	mov	DWORD PTR [edi+0x4],eax
80484cc:	e8 b9 ff ff ff	call	0x804848a
80484d1:	c3	ret	
80484d2:	b9 e6 84 04 08	mov	ecx,0x80484e6
80484d7:	ba 06 00 00 00	mov	edx,0x6
80484dc:	e8 8f fc ff ff	call	0x8048170
80484e1:	e9 07 00 00 00	jmp	0x80484ed
80484e6:	42	inc	edx
80484e7:	41	inc	ecx
80484e8:	53	push	ebx
80484e9:	45	inc	ebp
80484ea:	3a 20	cmp	ah,BYTE PTR [eax]
80484ec:	00 e8	add	al,ch
80484ee:	1e	push	ds
80484ef:	fe	(bad)	
80484f0:	ff	(bad)	

80484f1:	ff 89 87 00 00 00	dec	DWORD PTR [ecx+0x87]
80484f7:	00 b9 0c 85 04 08	add	BYTE PTR [ecx+0x804850c],bh
80484fd:	ba 0b 00 00 00	mov	edx,0xb
8048502:	e8 69 fc ff ff	call	0x8048170
8048507:	e9 0c 00 00 00	jmp	0x8048518
804850c:	45	inc	ebp
804850d:	58	pop	eax
804850e:	50	push	eax
804850f:	4f	dec	edi
8048510:	4e	dec	esi
8048511:	45	inc	ebp
8048512:	4e	dec	esi
8048513:	54	push	esp
8048514:	45	inc	ebp
8048515:	3a 20	cmp	ah,BYTE PTR [eax]
8048517:	00 e8	add	al,ch
8048519:	f3 fd	repz std	
804851b:	ff	(bad)	
804851c:	ff 89 87 04 00 00	dec	DWORD PTR [ecx+0x487]
8048522:	00 b8 01 00 00 00	add	BYTE PTR [eax+0x1],bh
8048528:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
804852e:	e8 57 ff ff ff	call	0x804848a
8048533:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
8048539:	50	push	eax
804853a:	b8 00 00 00 00	mov	eax,0x0
804853f:	5b	pop	ebx
8048540:	39 c3	cmp	ebx,eax
8048542:	7c 05	j1	0x8048549
8048544:	e9 0b 00 00 00	jmp	0x8048554
8048549:	b8 00 00 00 00	mov	eax,0x0
804854e:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048554:	b9 68 85 04 08	mov	ecx,0x8048568
8048559:	ba 0b 00 00 00	mov	edx,0xb
804855e:	e8 0d fc ff ff	call	0x8048170
8048563:	e9 0c 00 00 00	jmp	0x8048574
8048568:	52	push	edx
8048569:	45	inc	ebp
804856a:	53	push	ebx
804856b:	55	push	ebp
804856c:	4c	dec	esp
804856d:	54	push	esp
804856e:	41	inc	ecx
804856f:	44	inc	esp
8048570:	4f	dec	edi
8048571:	3a 20	cmp	ah,BYTE PTR [eax]
8048573:	00 8b 87 08 00 00	add	BYTE PTR [ebx+0x887],cl

8048579:	00 e8	add	al,ch
804857b:	11 fc	adc	esp,edi
804857d:	ff	(bad)	
804857e:	ff	(bad)	
804857f:	e8 fc fb ff ff	call	0x8048180
8048584:	e8 f7 fb ff ff	call	0x8048180
8048589:	e9 72 fd ff ff	jmp	0x8048300
...			

3.3. BIEN-02

3.3.1. Código Fuente

```

var X, Y, Z;

procedure MULTIPLICAR;
var A, B;
begin
  A := X;
  B := Y;
  Z := 0;
  if X < 0 then A := -A;
  if Y < 0 then B := -B;
  while B > 0 do
    begin
      if odd B then Z:= Z + A;
      A := A * 2;
      B := B / 2
    end;
  if X < 0 then Z:= -Z;
  if Y < 0 then Z:= -Z
end;

Begin
  write ('X: '); readLn (X);
  write ('Y: '); readLn (Y);
  call MULTIPLICAR;
  writeLn ('X*Y=', Z);
end.

```

3.3.2. Contenido Hexadecimal Completo

```

0000000 457f 464c 0101 0001 0000 0000 0000 0000
0000010 0002 0003 0001 0000 8480 0804 0034 0000
0000020 0065 0000 0000 0000 0034 0020 0001 0028
0000030 0003 0001 0001 0000 0000 0000 8000 0804
0000040 8000 0804 0637 0000 0637 0000 0007 0000

```

0000050	1000	0000	2e00	6873	7473	7472	6261	2e00
0000060	6574	7478	0000	0000	0000	0000	0000	0000
0000070	0000	0000	0000	0000	0000	0000	0000	0000
0000080	0000	0000	0000	0000	0000	0000	0100	0000
0000090	0300	0000	0000	0000	0000	0000	5400	0000
00000a0	1100	0000	0000	0000	0000	0000	0100	0000
00000b0	0000	0000	0b00	0000	0100	0000	0600	0000
00000c0	e000	0480	e008	0000	5700	0005	0000	0000
00000d0	0000	0000	0100	0000	0000	0000	0000	0000
00000e0	5152	5053	04b8	0000	bb00	0001	0000	e189
00000f0	01ba	0000	cd00	5880	595b	c35a	8955	81e5
0000100	24ec	0000	5200	5351	36b8	0000	bb00	0000
0000110	0000	01b9	0054	8d00	dc55	80cd	6581	f5e8
0000120	ffff	b8ff	0036	0000	00bb	0000	b900	5402
0000130	0000	558d	cddc	3180	50c0	03b8	0000	bb00
0000140	0000	0000	e189	01ba	0000	cd00	8180	e84d
0000150	000a	0000	36b8	0000	bb00	0000	0000	02b9
0000160	0054	8d00	dc55	80cd	5b58	5a59	ec89	c35d
0000170	04b8	0000	bb00	0001	0000	80cd	90c3	9090
0000180	0ab0	59e8	ffff	c3ff	3004	51e8	ffff	c3ff
0000190	003d	0000	7580	b04e	e82d	ff42	ffff	02b0
00001a0	e3e8	ffff	b0ff	e801	ffdc	ffff	04b0	d5e8
00001b0	ffff	b0ff	e807	ffce	ffff	04b0	c7e8	ffff
00001c0	b0ff	e808	ffc0	ffff	03b0	b9e8	ffff	b0ff
00001d0	e806	ffb2	ffff	04b0	abe8	ffff	b0ff	e808
00001e0	ffa4	ffff	3dc3	0000	0000	0b7d	b050	e82d
00001f0	feec	ffff	f758	3dd8	000a	0000	8c0f	00ef
0000200	0000	643d	0000	0f00	d18c	0000	3d00	03e8
0000210	0000	8c0f	00b3	0000	103d	0027	0f00	958c
0000220	0000	3d00	86a0	0001	7b7c	403d	0f42	7c00
0000230	3d61	9680	0098	477c	003d	f5e1	7c05	3d2d
0000240	ca00	3b9a	137c	00ba	0000	bb00	ca00	3b9a
0000250	fbf7	e852	ff30	ffff	ba58	0000	0000	00bb
0000260	f5e1	f705	52fb	1de8	ffff	58ff	00ba	0000
0000270	bb00	9680	0098	fbf7	e852	ff0a	ffff	ba58
0000280	0000	0000	40bb	0f42	f700	52fb	f7e8	fffe
0000290	58ff	00ba	0000	bb00	86a0	0001	fbf7	e852
00002a0	fee4	ffff	ba58	0000	0000	10bb	0027	f700
00002b0	52fb	d1e8	fffe	58ff	00ba	0000	bb00	03e8
00002c0	0000	fbf7	e852	febe	ffff	ba58	0000	0000
00002d0	64bb	0000	f700	52fb	abe8	fffe	58ff	00ba
00002e0	0000	bb00	000a	0000	fbf7	e852	fe98	ffff
00002f0	e858	fe92	ffff	90c3	9090	9090	9090	9090
0000300	01b8	0000	bb00	0000	0000	80cd	9090	9090
0000310	00b9	0000	b300	5103	e853	fdde	ffff	595b
0000320	0a3c	840f	0134	0000	7f3c	840f	0094	0000

```

0000330 2d3c 840f 0109 0000 303c db7c 393c d77f
0000340 302c fb80 7400 80d0 02fb 0c75 f981 0000
0000350 0000 0475 003c bf74 fb80 7503 3c0a 7500
0000360 b304 eb00 b302 8101 ccf9 cccc 7f0c 81a8
0000370 34f9 3333 7cf3 88a0 b8c7 000a 0000 e9f7
0000380 083d 0000 7480 3d11 fff8 7fff 1375 ff80
0000390 7e07 e90e ff7f ffff ff80 0f08 768f ffff
00003a0 b9ff 0000 0000 f988 fb80 7402 0104 ebc1
00003b0 2903 91c8 f888 5351 cbe8 fffd 5bff e959
00003c0 ff53 ffff fb80 0f03 4a84 ffff 51ff b053
00003d0 e808 fd0a ffff 20b0 03e8 fffd b0ff e808
00003e0 fcf8 ffff 595b fb80 7500 b307 e903 ff25
00003f0 ffff fb80 7502 810f 00f9 0000 7500 b307
0000400 e903 ff11 ffff c889 0ab9 0000 ba00 0000
0000410 0000 003d 0000 7d00 f708 f7d8 f7f9 ebd8
0000420 f702 89f9 81c1 00f9 0000 0f00 e685 fffe
0000430 80ff 02fb 840f fedd ffff 03b3 d6e9 fffe
0000440 80ff 03fb 850f fecd ffff 2db0 5351 8de8
0000450 fffc 5bff b359 e902 febb ffff fb80 0f03
0000460 b284 fffe 80ff 02fb 0c75 f981 0000 0000
0000470 840f fea1 ffff e851 fd04 ffff 8959 c3c8
0000480 23bf 0486 e908 0120 0000 878b 0000 0000
0000490 8789 000c 0000 878b 0004 0000 8789 0010
00004a0 0000 00b8 0000 8900 0887 0000 8b00 0087
00004b0 0000 5000 00b8 0000 5b00 c339 057c 0ee9
00004c0 0000 8b00 0c87 0000 f700 89d8 0c87 0000
00004d0 8b00 0487 0000 5000 00b8 0000 5b00 c339
00004e0 057c 0ee9 0000 8b00 1087 0000 f700 89d8
00004f0 1087 0000 8b00 1087 0000 5000 00b8 0000
0000500 5b00 c339 057f 56e9 0000 8b00 1087 0000
0000510 a800 7b01 e905 0016 0000 878b 0008 0000
0000520 8b50 0c87 0000 5b00 d801 8789 0008 0000
0000530 878b 000c 0000 b850 0002 0000 f75b 89eb
0000540 0c87 0000 8b00 1087 0000 5000 02b8 0000
0000550 5b00 9993 fb7f 8789 0010 0000 94e9 ffff
0000560 8bff 0087 0000 5000 00b8 0000 5b00 c339
0000570 057c 0ee9 0000 8b00 0887 0000 f700 89d8
0000580 0887 0000 8b00 0487 0000 5000 00b8 0000
0000590 5b00 c339 057c 0ee9 0000 8b00 0887 0000
00005a0 f700 89d8 0887 0000 c300 beb9 0485 ba08
00005b0 0003 0000 b7e8 fffb e9ff 0004 0000 3a58
00005c0 0020 49e8 fffd 89ff 0087 0000 b900 85e1
00005d0 0804 03ba 0000 e800 fb94 ffff 04e9 0000
00005e0 5900 203a e800 fd26 ffff 8789 0004 0000
00005f0 95e8 fffe b9ff 8609 0804 04ba 0000 e800
0000600 fb6c ffff 05e9 0000 5800 592a 003d 878b

```

```

0000610 0008 0000 77e8 fffb e8ff fb62 ffff dde9
0000620 fffc 00ff 0000 0000 0000 0000 0000 0000
0000630 0000 0000 0000 0000
0000637

```

3.3.3. Listado Desensamblado de la sección *.text*

text/BIEN-02: formato del fichero elf32-i386

Desensamblado de la sección *.text*:

080480e0 <.text>:

...

8048480:	bf 23 86 04 08	mov	edi,0x8048623
8048485:	e9 20 01 00 00	jmp	0x80485aa
804848a:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
8048490:	89 87 0c 00 00 00	mov	DWORD PTR [edi+0xc],eax
8048496:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
804849c:	89 87 10 00 00 00	mov	DWORD PTR [edi+0x10],eax
80484a2:	b8 00 00 00 00	mov	eax,0x0
80484a7:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
80484ad:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
80484b3:	50	push	eax
80484b4:	b8 00 00 00 00	mov	eax,0x0
80484b9:	5b	pop	ebx
80484ba:	39 c3	cmp	ebx,eax
80484bc:	7c 05	j1	0x80484c3
80484be:	e9 0e 00 00 00	jmp	0x80484d1
80484c3:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
80484c9:	f7 d8	neg	eax
80484cb:	89 87 0c 00 00 00	mov	DWORD PTR [edi+0xc],eax
80484d1:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
80484d7:	50	push	eax
80484d8:	b8 00 00 00 00	mov	eax,0x0
80484dd:	5b	pop	ebx
80484de:	39 c3	cmp	ebx,eax
80484e0:	7c 05	j1	0x80484e7
80484e2:	e9 0e 00 00 00	jmp	0x80484f5
80484e7:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
80484ed:	f7 d8	neg	eax
80484ef:	89 87 10 00 00 00	mov	DWORD PTR [edi+0x10],eax
80484f5:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
80484fb:	50	push	eax
80484fc:	b8 00 00 00 00	mov	eax,0x0
8048501:	5b	pop	ebx

8048502:	39 c3	cmp	ebx,eax
8048504:	7f 05	jg	0x804850b
8048506:	e9 56 00 00 00	jmp	0x8048561
804850b:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
8048511:	a8 01	test	al,0x1
8048513:	7b 05	jnp	0x804851a
8048515:	e9 16 00 00 00	jmp	0x8048530
804851a:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048520:	50	push	eax
8048521:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
8048527:	5b	pop	ebx
8048528:	01 d8	add	eax,ebx
804852a:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048530:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
8048536:	50	push	eax
8048537:	b8 02 00 00 00	mov	eax,0x2
804853c:	5b	pop	ebx
804853d:	f7 eb	imul	ebx
804853f:	89 87 0c 00 00 00	mov	DWORD PTR [edi+0xc],eax
8048545:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
804854b:	50	push	eax
804854c:	b8 02 00 00 00	mov	eax,0x2
8048551:	5b	pop	ebx
8048552:	93	xchg	ebx,eax
8048553:	99	cdq	
8048554:	f7 fb	idiv	ebx
8048556:	89 87 10 00 00 00	mov	DWORD PTR [edi+0x10],eax
804855c:	e9 94 ff ff ff	jmp	0x80484f5
8048561:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
8048567:	50	push	eax
8048568:	b8 00 00 00 00	mov	eax,0x0
804856d:	5b	pop	ebx
804856e:	39 c3	cmp	ebx,eax
8048570:	7c 05	j1	0x8048577
8048572:	e9 0e 00 00 00	jmp	0x8048585
8048577:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
804857d:	f7 d8	neg	eax
804857f:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048585:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
804858b:	50	push	eax
804858c:	b8 00 00 00 00	mov	eax,0x0
8048591:	5b	pop	ebx
8048592:	39 c3	cmp	ebx,eax
8048594:	7c 05	j1	0x804859b
8048596:	e9 0e 00 00 00	jmp	0x80485a9
804859b:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]

80485a1:	f7 d8	neg	eax
80485a3:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
80485a9:	c3	ret	
80485aa:	b9 be 85 04 08	mov	ecx,0x80485be
80485af:	ba 03 00 00 00	mov	edx,0x3
80485b4:	e8 b7 fb ff ff	call	0x8048170
80485b9:	e9 04 00 00 00	jmp	0x80485c2
80485be:	58	pop	eax
80485bf:	3a 20	cmp	ah,BYTE PTR [eax]
80485c1:	00 e8	add	al,ch
80485c3:	49	dec	ecx
80485c4:	fd	std	
80485c5:	ff	(bad)	
80485c6:	ff 89 87 00 00 00	dec	DWORD PTR [ecx+0x87]
80485cc:	00 b9 e1 85 04 08	add	BYTE PTR [ecx+0x80485e1],bh
80485d2:	ba 03 00 00 00	mov	edx,0x3
80485d7:	e8 94 fb ff ff	call	0x8048170
80485dc:	e9 04 00 00 00	jmp	0x80485e5
80485e1:	59	pop	ecx
80485e2:	3a 20	cmp	ah,BYTE PTR [eax]
80485e4:	00 e8	add	al,ch
80485e6:	26	es	
80485e7:	fd	std	
80485e8:	ff	(bad)	
80485e9:	ff 89 87 04 00 00	dec	DWORD PTR [ecx+0x487]
80485ef:	00 e8	add	al,ch
80485f1:	95	xchg	ebp,ecx
80485f2:	fe	(bad)	
80485f3:	ff	(bad)	
80485f4:	ff	(bad)	
80485f5:	b9 09 86 04 08	mov	ecx,0x8048609
80485fa:	ba 04 00 00 00	mov	edx,0x4
80485ff:	e8 6c fb ff ff	call	0x8048170
8048604:	e9 05 00 00 00	jmp	0x804860e
8048609:	58	pop	eax
804860a:	2a 59 3d	sub	bl,BYTE PTR [ecx+0x3d]
804860d:	00 8b 87 08 00 00	add	BYTE PTR [ebx+0x887],cl
8048613:	00 e8	add	al,ch
8048615:	77 fb	ja	0x8048612
8048617:	ff	(bad)	
8048618:	ff	(bad)	
8048619:	e8 62 fb ff ff	call	0x8048180
804861e:	e9 dd fc ff ff	jmp	0x8048300

...

3.4. BIEN-03

3.4.1. Código Fuente

```
var X, Y, Q, R;

procedure DIVIDIR;
var V, W;
begin
    Q := 0;
    R := X; if R < 0 then R := -R;
    W := Y; if W < 0 then W := -W;
    V := Y; if V < 0 then V := -V;
    while W <= R do W := W * 2;
    while W > V do
        begin
            Q := Q * 2; W := W / 2;
            if W <= R then
                begin
                    R := R - W; Q := Q + 1
                end
            end;
        end;
    if X < 0 then R := -R;
    if X < 0 then Q := -Q;
    if Y < 0 then Q := -Q;
end;

procedure OTRO;
    procedure DIVIDIR;
    begin
        Q := X / Y; R := X - Y * Q
    end;
call DIVIDIR;

procedure SALIDA;
begin
    write ('Cociente: ', Q); writeln;
    write ('Resto: ', R); writeln;
end;

begin
    write ('Dividendo: '); readln (X);
    write ('Divisor: '); readln (Y);
    writeln;
    if Y <> 0 then
        begin
            write ('Metodo 1'); writeln;
            call DIVIDIR;
            call SALIDA; writeln;
        end
    end;
```

```

write ('Metodo 2'); writeln;
call OTR0;
call SALIDA;
end
end.

```

3.4.2. Contenido Hexadecimal Completo

```

0000000 457f 464c 0101 0001 0000 0000 0000 0000
0000010 0002 0003 0001 0000 8480 0804 0034 0000
0000020 0065 0000 0000 0000 0034 0020 0001 0028
0000030 0003 0001 0001 0000 0000 0000 8000 0804
0000040 8000 0804 07d8 0000 07d8 0000 0007 0000
0000050 1000 0000 2e00 6873 7473 7472 6261 2e00
0000060 6574 7478 0000 0000 0000 0000 0000 0000
0000070 0000 0000 0000 0000 0000 0000 0000 0000
0000080 0000 0000 0000 0000 0000 0000 0100 0000
0000090 0300 0000 0000 0000 0000 0000 5400 0000
00000a0 1100 0000 0000 0000 0000 0000 0100 0000
00000b0 0000 0000 0b00 0000 0100 0000 0600 0000
00000c0 e000 0480 e008 0000 f800 0006 0000 0000
00000d0 0000 0000 0100 0000 0000 0000 0000 0000
00000e0 5152 5053 04b8 0000 bb00 0001 0000 e189
00000f0 01ba 0000 cd00 5880 595b c35a 8955 81e5
0000100 24ec 0000 5200 5351 36b8 0000 bb00 0000
0000110 0000 01b9 0054 8d00 dc55 80cd 6581 f5e8
0000120 ffff b8ff 0036 0000 00bb 0000 b900 5402
0000130 0000 558d cddc 3180 50c0 03b8 0000 bb00
0000140 0000 0000 e189 01ba 0000 cd00 8180 e84d
0000150 000a 0000 36b8 0000 bb00 0000 0000 02b9
0000160 0054 8d00 dc55 80cd 5b58 5a59 ec89 c35d
0000170 04b8 0000 bb00 0001 0000 80cd 90c3 9090
0000180 0ab0 59e8 ffff c3ff 3004 51e8 ffff c3ff
0000190 003d 0000 7580 b04e e82d ff42 ffff 02b0
00001a0 e3e8 ffff b0ff e801 ffdc ffff 04b0 d5e8
00001b0 ffff b0ff e807 ffce ffff 04b0 c7e8 ffff
00001c0 b0ff e808 ffc0 ffff 03b0 b9e8 ffff b0ff
00001d0 e806 ffb2 ffff 04b0 abe8 ffff b0ff e808
00001e0 ffa4 ffff 3dc3 0000 0000 0b7d b050 e82d
00001f0 feec ffff f758 3dd8 000a 0000 8c0f 00ef
0000200 0000 643d 0000 0f00 d18c 0000 3d00 03e8
0000210 0000 8c0f 00b3 0000 103d 0027 0f00 958c
0000220 0000 3d00 86a0 0001 7b7c 403d 0f42 7c00
0000230 3d61 9680 0098 477c 003d f5e1 7c05 3d2d
0000240 ca00 3b9a 137c 00ba 0000 bb00 ca00 3b9a
0000250 fbf7 e852 ff30 ffff ba58 0000 0000 00bb

```

```

0000260 f5e1 f705 52fb 1de8 ffff 58ff 00ba 0000
0000270 bb00 9680 0098 fbf7 e852 ff0a ffff ba58
0000280 0000 0000 40bb 0f42 f700 52fb f7e8 fffe
0000290 58ff 00ba 0000 bb00 86a0 0001 fbf7 e852
00002a0 fee4 ffff ba58 0000 0000 10bb 0027 f700
00002b0 52fb d1e8 fffe 58ff 00ba 0000 bb00 03e8
00002c0 0000 fbf7 e852 febe ffff ba58 0000 0000
00002d0 64bb 0000 f700 52fb abe8 fffe 58ff 00ba
00002e0 0000 bb00 000a 0000 fbf7 e852 fe98 ffff
00002f0 e858 fe92 ffff 90c3 9090 9090 9090 9090
0000300 01b8 0000 bb00 0000 0000 80cd 9090 9090
0000310 00b9 0000 b300 5103 e853 fdde ffff 595b
0000320 0a3c 840f 0134 0000 7f3c 840f 0094 0000
0000330 2d3c 840f 0109 0000 303c db7c 393c d77f
0000340 302c fb80 7400 80d0 02fb 0c75 f981 0000
0000350 0000 0475 003c bf74 fb80 7503 3c0a 7500
0000360 b304 eb00 b302 8101 cc9f cccc 7f0c 81a8
0000370 34f9 3333 7cf3 88a0 b8c7 000a 0000 e9f7
0000380 083d 0000 7480 3d11 fff8 7fff 1375 ff80
0000390 7e07 e90e ff7f ffff ff80 0f08 768f ffff
00003a0 b9ff 0000 0000 f988 fb80 7402 0104 ebc1
00003b0 2903 91c8 f888 5351 cbe8 fffd 5bff e959
00003c0 ff53 ffff fb80 0f03 4a84 ffff 51ff b053
00003d0 e808 fd0a ffff 20b0 03e8 fffd b0ff e808
00003e0 fcf8 ffff 595b fb80 7500 b307 e903 ff25
00003f0 ffff fb80 7502 810f 00f9 0000 7500 b307
0000400 e903 ff11 ffff c889 0ab9 0000 ba00 0000
0000410 0000 003d 0000 7d00 f708 f7d8 f7f9 ebd8
0000420 f702 89f9 81c1 00f9 0000 0f00 e685 fffe
0000430 80ff 02fb 840f fedd ffff 03b3 d6e9 fffe
0000440 80ff 03fb 850f fecd ffff 2db0 5351 8de8
0000450 fffc 5bff b359 e902 febb ffff fb80 0f03
0000460 b284 fffe 80ff 02fb 0c75 f981 0000 0000
0000470 840f fea1 ffff e851 fd04 ffff 8959 c3c8
0000480 c0bf 0487 e908 0265 0000 00b8 0000 8900
0000490 0887 0000 8b00 0087 0000 8900 0c87 0000
00004a0 8b00 0c87 0000 5000 00b8 0000 5b00 c339
00004b0 057c 0ee9 0000 8b00 0c87 0000 f700 89d8
00004c0 0c87 0000 8b00 0487 0000 8900 1487 0000
00004d0 8b00 1487 0000 5000 00b8 0000 5b00 c339
00004e0 057c 0ee9 0000 8b00 1487 0000 f700 89d8
00004f0 1487 0000 8b00 0487 0000 8900 1087 0000
0000500 8b00 1087 0000 5000 00b8 0000 5b00 c339
0000510 057c 0ee9 0000 8b00 1087 0000 f700 89d8
0000520 1087 0000 8b00 1487 0000 5000 878b 000c
0000530 0000 395b 7ec3 e905 001a 0000 878b 0014

```

```

0000540 0000 b850 0002 0000 f75b 89eb 1487 0000
0000550 e900 ffcf ffff 878b 0014 0000 8b50 1087
0000560 0000 5b00 c339 057f 74e9 0000 8b00 0887
0000570 0000 5000 02b8 0000 5b00 ebf7 8789 0008
0000580 0000 878b 0014 0000 b850 0002 0000 935b
0000590 f799 89fb 1487 0000 8b00 1487 0000 5000
00005a0 878b 000c 0000 395b 7ec3 e905 002c 0000
00005b0 878b 000c 0000 8b50 1487 0000 5b00 2993
00005c0 89d8 0c87 0000 8b00 0887 0000 5000 01b8
00005d0 0000 5b00 d801 8789 0008 0000 75e9 ffff
00005e0 8bff 0087 0000 5000 00b8 0000 5b00 c339
00005f0 057c 0ee9 0000 8b00 0c87 0000 f700 89d8
0000600 0c87 0000 8b00 0087 0000 5000 00b8 0000
0000610 5b00 c339 057c 0ee9 0000 8b00 0887 0000
0000620 f700 89d8 0887 0000 8b00 0487 0000 5000
0000630 00b8 0000 5b00 c339 057c 0ee9 0000 8b00
0000640 0887 0000 f700 89d8 0887 0000 c300 3ae9
0000650 0000 8b00 0087 0000 5000 878b 0004 0000
0000660 935b f799 89fb 0887 0000 8b00 0087 0000
0000670 5000 878b 0004 0000 8b50 0887 0000 5b00
0000680 ebf7 935b d829 8789 000c 0000 e8c3 ffc1
0000690 ffff b9c3 86a7 0804 0aba 0000 e800 face
00006a0 ffff 0be9 0000 4300 636f 6569 746e 3a65
00006b0 0020 878b 0008 0000 d3e8 fffa e8ff fabe
00006c0 ffff d6b9 0486 ba08 0007 0000 9fe8 fffa
00006d0 e9ff 0008 0000 6552 7473 3a6f 0020 878b
00006e0 000c 0000 a7e8 fffa e8ff fa92 ffff b9c3
00006f0 8703 0804 0bba 0000 e800 fa72 ffff 0ce9
0000700 0000 4400 7669 6469 6e65 6f64 203a e800
0000710 fbfc ffff 8789 0000 0000 2eb9 0487 ba08
0000720 0009 0000 47e8 fffa e9ff 000a 0000 6944
0000730 6976 6f73 3a72 0020 d3e8 fffb 89ff 0487
0000740 0000 e800 fa38 ffff 878b 0004 0000 b850
0000750 0000 0000 395b 75c3 e905 005d 0000 72b9
0000760 0487 ba08 0008 0000 03e8 fffa e9ff 0009
0000770 0000 654d 6f74 6f64 3120 e800 fa00 ffff
0000780 05e8 fffd e8ff ff09 ffff f1e8 fff9 b9ff
0000790 87a3 0804 08ba 0000 e800 f9d2 ffff 09e9
00007a0 0000 4d00 7465 646f 206f 0032 cfe8 fff9
00007b0 e8ff fe98 ffff d8e8 fffe e9ff fb40 ffff
00007c0 0000 0000 0000 0000 0000 0000 0000 0000

```

*

00007d8

3.4.3. Listado Desensamblado de la sección *.text*

text/BIEN-03: formato del fichero elf32-i386

Desensamblado de la sección *.text*:

080480e0 <.text>:

...

8048480:	bf c0 87 04 08	mov	edi,0x80487c0
8048485:	e9 65 02 00 00	jmp	0x80486ef
804848a:	b8 00 00 00 00	mov	eax,0x0
804848f:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048495:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
804849b:	89 87 0c 00 00 00	mov	DWORD PTR [edi+0xc],eax
80484a1:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
80484a7:	50	push	eax
80484a8:	b8 00 00 00 00	mov	eax,0x0
80484ad:	5b	pop	ebx
80484ae:	39 c3	cmp	ebx,eax
80484b0:	7c 05	j1	0x80484b7
80484b2:	e9 0e 00 00 00	jmp	0x80484c5
80484b7:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
80484bd:	f7 d8	neg	eax
80484bf:	89 87 0c 00 00 00	mov	DWORD PTR [edi+0xc],eax
80484c5:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
80484cb:	89 87 14 00 00 00	mov	DWORD PTR [edi+0x14],eax
80484d1:	8b 87 14 00 00 00	mov	eax,DWORD PTR [edi+0x14]
80484d7:	50	push	eax
80484d8:	b8 00 00 00 00	mov	eax,0x0
80484dd:	5b	pop	ebx
80484de:	39 c3	cmp	ebx,eax
80484e0:	7c 05	j1	0x80484e7
80484e2:	e9 0e 00 00 00	jmp	0x80484f5
80484e7:	8b 87 14 00 00 00	mov	eax,DWORD PTR [edi+0x14]
80484ed:	f7 d8	neg	eax
80484ef:	89 87 14 00 00 00	mov	DWORD PTR [edi+0x14],eax
80484f5:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
80484fb:	89 87 10 00 00 00	mov	DWORD PTR [edi+0x10],eax
8048501:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
8048507:	50	push	eax
8048508:	b8 00 00 00 00	mov	eax,0x0
804850d:	5b	pop	ebx
804850e:	39 c3	cmp	ebx,eax
8048510:	7c 05	j1	0x8048517
8048512:	e9 0e 00 00 00	jmp	0x8048525

8048517:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
804851d:	f7 d8	neg	eax
804851f:	89 87 10 00 00 00	mov	DWORD PTR [edi+0x10],eax
8048525:	8b 87 14 00 00 00	mov	eax,DWORD PTR [edi+0x14]
804852b:	50	push	eax
804852c:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
8048532:	5b	pop	ebx
8048533:	39 c3	cmp	ebx,eax
8048535:	7e 05	jle	0x804853c
8048537:	e9 1a 00 00 00	jmp	0x8048556
804853c:	8b 87 14 00 00 00	mov	eax,DWORD PTR [edi+0x14]
8048542:	50	push	eax
8048543:	b8 02 00 00 00	mov	eax,0x2
8048548:	5b	pop	ebx
8048549:	f7 eb	imul	ebx
804854b:	89 87 14 00 00 00	mov	DWORD PTR [edi+0x14],eax
8048551:	e9 cf ff ff ff	jmp	0x8048525
8048556:	8b 87 14 00 00 00	mov	eax,DWORD PTR [edi+0x14]
804855c:	50	push	eax
804855d:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
8048563:	5b	pop	ebx
8048564:	39 c3	cmp	ebx,eax
8048566:	7f 05	jg	0x804856d
8048568:	e9 74 00 00 00	jmp	0x80485e1
804856d:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048573:	50	push	eax
8048574:	b8 02 00 00 00	mov	eax,0x2
8048579:	5b	pop	ebx
804857a:	f7 eb	imul	ebx
804857c:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048582:	8b 87 14 00 00 00	mov	eax,DWORD PTR [edi+0x14]
8048588:	50	push	eax
8048589:	b8 02 00 00 00	mov	eax,0x2
804858e:	5b	pop	ebx
804858f:	93	xchg	ebx,eax
8048590:	99	cdq	
8048591:	f7 fb	idiv	ebx
8048593:	89 87 14 00 00 00	mov	DWORD PTR [edi+0x14],eax
8048599:	8b 87 14 00 00 00	mov	eax,DWORD PTR [edi+0x14]
804859f:	50	push	eax
80485a0:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
80485a6:	5b	pop	ebx
80485a7:	39 c3	cmp	ebx,eax
80485a9:	7e 05	jle	0x80485b0
80485ab:	e9 2c 00 00 00	jmp	0x80485dc
80485b0:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]

80485b6:	50	push	eax
80485b7:	8b 87 14 00 00 00	mov	eax,DWORD PTR [edi+0x14]
80485bd:	5b	pop	ebx
80485be:	93	xchg	ebx, eax
80485bf:	29 d8	sub	eax, ebx
80485c1:	89 87 0c 00 00 00	mov	DWORD PTR [edi+0xc], eax
80485c7:	8b 87 08 00 00 00	mov	eax, DWORD PTR [edi+0x8]
80485cd:	50	push	eax
80485ce:	b8 01 00 00 00	mov	eax, 0x1
80485d3:	5b	pop	ebx
80485d4:	01 d8	add	eax, ebx
80485d6:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8], eax
80485dc:	e9 75 ff ff ff	jmp	0x8048556
80485e1:	8b 87 00 00 00 00	mov	eax, DWORD PTR [edi+0x0]
80485e7:	50	push	eax
80485e8:	b8 00 00 00 00	mov	eax, 0x0
80485ed:	5b	pop	ebx
80485ee:	39 c3	cmp	ebx, eax
80485f0:	7c 05	jl	0x80485f7
80485f2:	e9 0e 00 00 00	jmp	0x8048605
80485f7:	8b 87 0c 00 00 00	mov	eax, DWORD PTR [edi+0xc]
80485fd:	f7 d8	neg	eax
80485ff:	89 87 0c 00 00 00	mov	DWORD PTR [edi+0xc], eax
8048605:	8b 87 00 00 00 00	mov	eax, DWORD PTR [edi+0x0]
804860b:	50	push	eax
804860c:	b8 00 00 00 00	mov	eax, 0x0
8048611:	5b	pop	ebx
8048612:	39 c3	cmp	ebx, eax
8048614:	7c 05	jl	0x804861b
8048616:	e9 0e 00 00 00	jmp	0x8048629
804861b:	8b 87 08 00 00 00	mov	eax, DWORD PTR [edi+0x8]
8048621:	f7 d8	neg	eax
8048623:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8], eax
8048629:	8b 87 04 00 00 00	mov	eax, DWORD PTR [edi+0x4]
804862f:	50	push	eax
8048630:	b8 00 00 00 00	mov	eax, 0x0
8048635:	5b	pop	ebx
8048636:	39 c3	cmp	ebx, eax
8048638:	7c 05	jl	0x804863f
804863a:	e9 0e 00 00 00	jmp	0x804864d
804863f:	8b 87 08 00 00 00	mov	eax, DWORD PTR [edi+0x8]
8048645:	f7 d8	neg	eax
8048647:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8], eax
804864d:	c3	ret	
804864e:	e9 3a 00 00 00	jmp	0x804868d
8048653:	8b 87 00 00 00 00	mov	eax, DWORD PTR [edi+0x0]

8048659:	50	push	eax
804865a:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
8048660:	5b	pop	ebx
8048661:	93	xchg	ebx, eax
8048662:	99	cdq	
8048663:	f7 fb	idiv	ebx
8048665:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8], eax
804866b:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
8048671:	50	push	eax
8048672:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
8048678:	50	push	eax
8048679:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
804867f:	5b	pop	ebx
8048680:	f7 eb	imul	ebx
8048682:	5b	pop	ebx
8048683:	93	xchg	ebx, eax
8048684:	29 d8	sub	eax, ebx
8048686:	89 87 0c 00 00 00	mov	DWORD PTR [edi+0xc], eax
804868c:	c3	ret	
804868d:	e8 c1 ff ff ff	call	0x8048653
8048692:	c3	ret	
8048693:	b9 a7 86 04 08	mov	ecx, 0x80486a7
8048698:	ba 0a 00 00 00	mov	edx, 0xa
804869d:	e8 ce fa ff ff	call	0x8048170
80486a2:	e9 0b 00 00 00	jmp	0x80486b2
80486a7:	43	inc	ebx
80486a8:	6f	outs	dx,DWORD PTR ds:[esi]
80486a9:	63 69 65	arpl	WORD PTR [ecx+0x65], bp
80486ac:	6e	outs	dx,BYTE PTR ds:[esi]
80486ad:	74 65	je	0x8048714
80486af:	3a 20	cmp	ah,BYTE PTR [eax]
80486b1:	00 8b 87 08 00 00	add	BYTE PTR [ebx+0x887], cl
80486b7:	00 e8	add	al, ch
80486b9:	d3 fa	sar	edx, cl
80486bb:	ff	(bad)	
80486bc:	ff	(bad)	
80486bd:	e8 be fa ff ff	call	0x8048180
80486c2:	b9 d6 86 04 08	mov	ecx, 0x80486d6
80486c7:	ba 07 00 00 00	mov	edx, 0x7
80486cc:	e8 9f fa ff ff	call	0x8048170
80486d1:	e9 08 00 00 00	jmp	0x80486de
80486d6:	52	push	edx
80486d7:	65	gs	
80486d8:	73 74	jae	0x804874e
80486da:	6f	outs	dx,DWORD PTR ds:[esi]
80486db:	3a 20	cmp	ah,BYTE PTR [eax]

80486dd:	00 8b 87 0c 00 00	add	BYTE PTR [ebx+0xc87],cl
80486e3:	00 e8	add	al,ch
80486e5:	a7	cmps	DWORD PTR ds:[esi],DWORD PTR es:[edi]
80486e6:	fa	cli	
80486e7:	ff	(bad)	
80486e8:	ff	(bad)	
80486e9:	e8 92 fa ff ff	call	0x8048180
80486ee:	c3	ret	
80486ef:	b9 03 87 04 08	mov	ecx,0x8048703
80486f4:	ba 0b 00 00 00	mov	edx,0xb
80486f9:	e8 72 fa ff ff	call	0x8048170
80486fe:	e9 0c 00 00 00	jmp	0x804870f
8048703:	44	inc	esp
8048704:	69 76 69 64 65 6e 64	imul	esi,DWORD PTR [esi+0x69],0x646e6564
804870b:	6f	outs	dx,DWORD PTR ds:[esi]
804870c:	3a 20	cmp	ah,BYTE PTR [eax]
804870e:	00 e8	add	al,ch
8048710:	fc	cld	
8048711:	fb	sti	
8048712:	ff	(bad)	
8048713:	ff 89 87 00 00 00	dec	DWORD PTR [ecx+0x87]
8048719:	00 b9 2e 87 04 08	add	BYTE PTR [ecx+0x804872e],bh
804871f:	ba 09 00 00 00	mov	edx,0x9
8048724:	e8 47 fa ff ff	call	0x8048170
8048729:	e9 0a 00 00 00	jmp	0x8048738
804872e:	44	inc	esp
804872f:	69 76 69 73 6f 72 3a	imul	esi,DWORD PTR [esi+0x69],0x3a726f73
8048736:	20 00	and	BYTE PTR [eax],al
8048738:	e8 d3 fb ff ff	call	0x8048310
804873d:	89 87 04 00 00 00	mov	DWORD PTR [edi+0x4],eax
8048743:	e8 38 fa ff ff	call	0x8048180
8048748:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
804874e:	50	push	eax
804874f:	b8 00 00 00 00	mov	eax,0x0
8048754:	5b	pop	ebx
8048755:	39 c3	cmp	ebx,eax
8048757:	75 05	jne	0x804875e
8048759:	e9 5d 00 00 00	jmp	0x80487bb
804875e:	b9 72 87 04 08	mov	ecx,0x8048772
8048763:	ba 08 00 00 00	mov	edx,0x8
8048768:	e8 03 fa ff ff	call	0x8048170
804876d:	e9 09 00 00 00	jmp	0x804877b
8048772:	4d	dec	ebp
8048773:	65	gs	
8048774:	74 6f	je	0x80487e5
8048776:	64 6f	outs	dx,DWORD PTR fs:[esi]

8048778:	20 31	and	BYTE PTR [ecx],dh
804877a:	00 e8	add	al,ch
804877c:	00 fa	add	dl,bh
804877e:	ff	(bad)	
804877f:	ff	(bad)	
8048780:	e8 05 fd ff ff	call	0x804848a
8048785:	e8 09 ff ff ff	call	0x8048693
804878a:	e8 f1 f9 ff ff	call	0x8048180
804878f:	b9 a3 87 04 08	mov	ecx,0x80487a3
8048794:	ba 08 00 00 00	mov	edx,0x8
8048799:	e8 d2 f9 ff ff	call	0x8048170
804879e:	e9 09 00 00 00	jmp	0x80487ac
80487a3:	4d	dec	ebp
80487a4:	65	gs	
80487a5:	74 6f	je	0x8048816
80487a7:	64 6f	outs	dx,DWORD PTR fs:[esi]
80487a9:	20 32	and	BYTE PTR [edx],dh
80487ab:	00 e8	add	al,ch
80487ad:	cf	iret	
80487ae:	f9	stc	
80487af:	ff	(bad)	
80487b0:	ff	(bad)	
80487b1:	e8 98 fe ff ff	call	0x804864e
80487b6:	e8 d8 fe ff ff	call	0x8048693
80487bb:	e9 40 fb ff ff	jmp	0x8048300
...			

3.5. BIEN-04

3.5.1. Código Fuente

```

var X, Y, Z;

procedure MCD;
var F,G;
begin
  F := X; G := Y;
  while F <> G do
    begin
      if F < G then G := G - F;
      IF G < F then F := F - G
    end;
  Z:= F
end;

begin
  write ('X: '); readln (X);

```

```

if X > 0 then
begin
write ('Y: '); readln (Y);
if Y > 0 then
begin
call MCD;
writeln ('MCD: ', Z); writeln
end
end
end.

```

3.5.2. Contenido Hexadecimal Completo

0000000	457f	464c	0101	0001	0000	0000	0000	0000
0000010	0002	0003	0001	0000	8480	0804	0034	0000
0000020	0065	0000	0000	0000	0034	0020	0001	0028
0000030	0003	0001	0001	0000	0000	0000	8000	0804
0000040	8000	0804	05e6	0000	05e6	0000	0007	0000
0000050	1000	0000	2e00	6873	7473	7472	6261	2e00
0000060	6574	7478	0000	0000	0000	0000	0000	0000
0000070	0000	0000	0000	0000	0000	0000	0000	0000
0000080	0000	0000	0000	0000	0000	0000	0100	0000
0000090	0300	0000	0000	0000	0000	0000	5400	0000
00000a0	1100	0000	0000	0000	0000	0000	0100	0000
00000b0	0000	0000	0b00	0000	0100	0000	0600	0000
00000c0	e000	0480	e008	0000	0600	0005	0000	0000
00000d0	0000	0000	0100	0000	0000	0000	0000	0000
00000e0	5152	5053	04b8	0000	bb00	0001	0000	e189
00000f0	01ba	0000	cd00	5880	595b	c35a	8955	81e5
0000100	24ec	0000	5200	5351	36b8	0000	bb00	0000
0000110	0000	01b9	0054	8d00	dc55	80cd	6581	f5e8
0000120	ffff	b8ff	0036	0000	00bb	0000	b900	5402
0000130	0000	558d	cddc	3180	50c0	03b8	0000	bb00
0000140	0000	0000	e189	01ba	0000	cd00	8180	e84d
0000150	000a	0000	36b8	0000	bb00	0000	0000	02b9
0000160	0054	8d00	dc55	80cd	5b58	5a59	ec89	c35d
0000170	04b8	0000	bb00	0001	0000	80cd	90c3	9090
0000180	0ab0	59e8	ffff	c3ff	3004	51e8	ffff	c3ff
0000190	003d	0000	7580	b04e	e82d	ff42	ffff	02b0
00001a0	e3e8	ffff	b0ff	e801	ffdc	ffff	04b0	d5e8
00001b0	ffff	b0ff	e807	ffce	ffff	04b0	c7e8	ffff
00001c0	b0ff	e808	ffc0	ffff	03b0	b9e8	ffff	b0ff
00001d0	e806	ffb2	ffff	04b0	abe8	ffff	b0ff	e808
00001e0	ffa4	ffff	3dc3	0000	0000	0b7d	b050	e82d
00001f0	feec	ffff	f758	3dd8	000a	0000	8c0f	00ef
0000200	0000	643d	0000	0f00	d18c	0000	3d00	03e8

0000210	0000	8c0f	00b3	0000	103d	0027	0f00	958c
0000220	0000	3d00	86a0	0001	7b7c	403d	0f42	7c00
0000230	3d61	9680	0098	477c	003d	f5e1	7c05	3d2d
0000240	ca00	3b9a	137c	00ba	0000	bb00	ca00	3b9a
0000250	fbf7	e852	ff30	ffff	ba58	0000	0000	00bb
0000260	f5e1	f705	52fb	1de8	ffff	58ff	00ba	0000
0000270	bb00	9680	0098	fbf7	e852	ff0a	ffff	ba58
0000280	0000	0000	40bb	0f42	f700	52fb	f7e8	fffe
0000290	58ff	00ba	0000	bb00	86a0	0001	fbf7	e852
00002a0	fee4	ffff	ba58	0000	0000	10bb	0027	f700
00002b0	52fb	d1e8	fffe	58ff	00ba	0000	bb00	03e8
00002c0	0000	fbf7	e852	febe	ffff	ba58	0000	0000
00002d0	64bb	0000	f700	52fb	abe8	fffe	58ff	00ba
00002e0	0000	bb00	000a	0000	fbf7	e852	fe98	ffff
00002f0	e858	fe92	ffff	90c3	9090	9090	9090	9090
0000300	01b8	0000	bb00	0000	0000	80cd	9090	9090
0000310	00b9	0000	b300	5103	e853	fdde	ffff	595b
0000320	0a3c	840f	0134	0000	7f3c	840f	0094	0000
0000330	2d3c	840f	0109	0000	303c	db7c	393c	d77f
0000340	302c	fb80	7400	80d0	02fb	0c75	f981	0000
0000350	0000	0475	003c	bf74	fb80	7503	3c0a	7500
0000360	b304	eb00	b302	8101	ccf9	cccc	7f0c	81a8
0000370	34f9	3333	7cf3	88a0	b8c7	000a	0000	e9f7
0000380	083d	0000	7480	3d11	fff8	7fff	1375	ff80
0000390	7e07	e90e	ff7f	ffff	ff80	0f08	768f	ffff
00003a0	b9ff	0000	0000	f988	fb80	7402	0104	ebc1
00003b0	2903	91c8	f888	5351	cbe8	fffd	5bff	e959
00003c0	ff53	ffff	fb80	0f03	4a84	ffff	51ff	b053
00003d0	e808	fd0a	ffff	20b0	03e8	fffd	b0ff	e808
00003e0	fcfc	ffff	595b	fb80	7500	b307	e903	ff25
00003f0	ffff	fb80	7502	810f	00f9	0000	7500	b307
0000400	e903	ff11	ffff	c889	0ab9	0000	ba00	0000
0000410	0000	003d	0000	7d00	f708	f7d8	f7f9	ebd8
0000420	f702	89f9	81c1	00f9	0000	0f00	e685	fffe
0000430	80ff	02fb	840f	fedd	ffff	03b3	d6e9	fffe
0000440	80ff	03fb	850f	fecb	ffff	2db0	5351	8de8
0000450	fffc	5bff	b359	e902	febb	ffff	fb80	0f03
0000460	b284	fffe	80ff	02fb	0c75	f981	0000	0000
0000470	840f	fea1	ffff	e851	fd04	ffff	8959	c3c8
0000480	d2bf	0485	e908	009d	0000	878b	0000	0000
0000490	8789	000c	0000	878b	0004	0000	8789	0010
00004a0	0000	878b	000c	0000	8b50	1087	0000	5b00
00004b0	c339	0575	61e9	0000	8b00	0c87	0000	5000
00004c0	878b	0010	0000	395b	7cc3	e905	0017	0000
00004d0	878b	0010	0000	8b50	0c87	0000	5b00	2993
00004e0	89d8	1087	0000	8b00	1087	0000	5000	878b

```

00004f0 000c 0000 395b 7cc3 e905 0017 0000 878b
0000500 000c 0000 8b50 1087 0000 5b00 2993 89d8
0000510 0c87 0000 e900 ff88 ffff 878b 000c 0000
0000520 8789 0008 0000 b9c3 853b 0804 03ba 0000
0000530 e800 fc3a ffff 04e9 0000 5800 203a e800
0000540 fdcc ffff 8789 0000 0000 878b 0000 0000
0000550 b850 0000 0000 395b 7fc3 e905 006d 0000
0000560 74b9 0485 ba08 0003 0000 01e8 fffc e9ff
0000570 0004 0000 3a59 0020 93e8 fffd 89ff 0487
0000580 0000 8b00 0487 0000 5000 00b8 0000 5b00
0000590 c339 057f 34e9 0000 e800 feec ffff b2b9
00005a0 0485 ba08 0005 0000 c3e8 fffb e9ff 0006
00005b0 0000 434d 3a44 0020 878b 0008 0000 cde8
00005c0 fffb e8ff fbb8 ffff b3e8 fffb e9ff fd2e
00005d0 ffff 0000 0000 0000 0000 0000 0000 0000
00005e0 0000 0000 0000
00005e6

```

3.5.3. Listado Desensamblado de la sección *.text*

text/BIEN-04: formato del fichero elf32-i386

Desensamblado de la sección *.text*:

080480e0 <.text>:

...

8048480:	bf d2 85 04 08	mov	edi,0x80485d2
8048485:	e9 9d 00 00 00	jmp	0x8048527
804848a:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
8048490:	89 87 0c 00 00 00	mov	DWORD PTR [edi+0xc],eax
8048496:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
804849c:	89 87 10 00 00 00	mov	DWORD PTR [edi+0x10],eax
80484a2:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
80484a8:	50	push	eax
80484a9:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
80484af:	5b	pop	ebx
80484b0:	39 c3	cmp	ebx,eax
80484b2:	75 05	jne	0x80484b9
80484b4:	e9 61 00 00 00	jmp	0x804851a
80484b9:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
80484bf:	50	push	eax
80484c0:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
80484c6:	5b	pop	ebx
80484c7:	39 c3	cmp	ebx,eax
80484c9:	7c 05	j1	0x80484d0

80484cb:	e9 17 00 00 00	jmp	0x80484e7
80484d0:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
80484d6:	50	push	eax
80484d7:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
80484dd:	5b	pop	ebx
80484de:	93	xchg	ebx,ebx
80484df:	29 d8	sub	eax,ebx
80484e1:	89 87 10 00 00 00	mov	DWORD PTR [edi+0x10],eax
80484e7:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
80484ed:	50	push	eax
80484ee:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
80484f4:	5b	pop	ebx
80484f5:	39 c3	cmp	ebx,ebx
80484f7:	7c 05	j1	0x80484fe
80484f9:	e9 17 00 00 00	jmp	0x8048515
80484fe:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
8048504:	50	push	eax
8048505:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
804850b:	5b	pop	ebx
804850c:	93	xchg	ebx,ebx
804850d:	29 d8	sub	eax,ebx
804850f:	89 87 0c 00 00 00	mov	DWORD PTR [edi+0xc],eax
8048515:	e9 88 ff ff ff	jmp	0x80484a2
804851a:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
8048520:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048526:	c3	ret	
8048527:	b9 3b 85 04 08	mov	ecx,0x804853b
804852c:	ba 03 00 00 00	mov	edx,0x3
8048531:	e8 3a fc ff ff	call	0x8048170
8048536:	e9 04 00 00 00	jmp	0x804853f
804853b:	58	pop	eax
804853c:	3a 20	cmp	ah,BYTE PTR [eax]
804853e:	00 e8	add	al,ch
8048540:	cc	int3	
8048541:	fd	std	
8048542:	ff	(bad)	
8048543:	ff 89 87 00 00 00	dec	DWORD PTR [ecx+0x87]
8048549:	00 8b 87 00 00 00	add	BYTE PTR [ebx+0x87],cl
804854f:	00 50 b8	add	BYTE PTR [eax-0x48],dl
8048552:	00 00	add	BYTE PTR [eax],al
8048554:	00 00	add	BYTE PTR [eax],al
8048556:	5b	pop	ebx
8048557:	39 c3	cmp	ebx,ebx
8048559:	7f 05	jg	0x8048560
804855b:	e9 6d 00 00 00	jmp	0x80485cd
8048560:	b9 74 85 04 08	mov	ecx,0x8048574

8048565:	ba 03 00 00 00	mov	edx,0x3
804856a:	e8 01 fc ff ff	call	0x8048170
804856f:	e9 04 00 00 00	jmp	0x8048578
8048574:	59	pop	ecx
8048575:	3a 20	cmp	ah,BYTE PTR [eax]
8048577:	00 e8	add	al,ch
8048579:	93	xchg	ebx,eax
804857a:	fd	std	
804857b:	ff	(bad)	
804857c:	ff 89 87 04 00 00	dec	DWORD PTR [ecx+0x487]
8048582:	00 8b 87 04 00 00	add	BYTE PTR [ebx+0x487],cl
8048588:	00 50 b8	add	BYTE PTR [eax-0x48],dl
804858b:	00 00	add	BYTE PTR [eax],al
804858d:	00 00	add	BYTE PTR [eax],al
804858f:	5b	pop	ebx
8048590:	39 c3	cmp	ebx,eax
8048592:	7f 05	jg	0x8048599
8048594:	e9 34 00 00 00	jmp	0x80485cd
8048599:	e8 ec fe ff ff	call	0x804848a
804859e:	b9 b2 85 04 08	mov	ecx,0x80485b2
80485a3:	ba 05 00 00 00	mov	edx,0x5
80485a8:	e8 c3 fb ff ff	call	0x8048170
80485ad:	e9 06 00 00 00	jmp	0x80485b8
80485b2:	4d	dec	ebp
80485b3:	43	inc	ebx
80485b4:	44	inc	esp
80485b5:	3a 20	cmp	ah,BYTE PTR [eax]
80485b7:	00 8b 87 08 00 00	add	BYTE PTR [ebx+0x887],cl
80485bd:	00 e8	add	al,ch
80485bf:	cd fb	int	0xfb
80485c1:	ff	(bad)	
80485c2:	ff	(bad)	
80485c3:	e8 b8 fb ff ff	call	0x8048180
80485c8:	e8 b3 fb ff ff	call	0x8048180
80485cd:	e9 2e fd ff ff	jmp	0x8048300
...			

3.6. BIEN-05

3.6.1. Código Fuente

VAR R, N;

PROCEDURE INICIALIZAR;

CONST UNO = 1;

R := -(-UNO);

```

PROCEDURE RAIZ;
BEGIN
    CALL INICIALIZAR;
    WHILE R * R < N DO R := R + 1
END;

BEGIN
    WRITE ('N: '); READLN (N);
    WRITE ('RAIZ CUADRADA DE ', N, ': ');
    IF N < 0 THEN WRITE ('ERROR');
    IF N = 0 THEN WRITE (0);
    IF N > 0 THEN
        BEGIN
            CALL RAIZ;
            IF R*R<>N THEN WRITE (R - 1, '...');
            WRITE (R);
        END;
    WRITELN
END.

```

3.6.2. Contenido Hexadecimal Completo

0000000	457f	464c	0101	0001	0000	0000	0000	0000
0000010	0002	0003	0001	0000	8480	0804	0034	0000
0000020	0065	0000	0000	0000	0034	0020	0001	0028
0000030	0003	0001	0001	0000	0000	0000	8000	0804
0000040	8000	0804	061b	0000	061b	0000	0007	0000
0000050	1000	0000	2e00	6873	7473	7472	6261	2e00
0000060	6574	7478	0000	0000	0000	0000	0000	0000
0000070	0000	0000	0000	0000	0000	0000	0000	0000
0000080	0000	0000	0000	0000	0000	0000	0100	0000
0000090	0300	0000	0000	0000	0000	0000	5400	0000
00000a0	1100	0000	0000	0000	0000	0000	0100	0000
00000b0	0000	0000	0b00	0000	0100	0000	0600	0000
00000c0	e000	0480	e008	0000	3b00	0005	0000	0000
00000d0	0000	0000	0100	0000	0000	0000	0000	0000
00000e0	5152	5053	04b8	0000	bb00	0001	0000	e189
00000f0	01ba	0000	cd00	5880	595b	c35a	8955	81e5
0000100	24ec	0000	5200	5351	36b8	0000	bb00	0000
0000110	0000	01b9	0054	8d00	dc55	80cd	6581	f5e8
0000120	ffff	b8ff	0036	0000	00bb	0000	b900	5402
0000130	0000	558d	cddc	3180	50c0	03b8	0000	bb00
0000140	0000	0000	e189	01ba	0000	cd00	8180	e84d
0000150	000a	0000	36b8	0000	bb00	0000	0000	02b9
0000160	0054	8d00	dc55	80cd	5b58	5a59	ec89	c35d
0000170	04b8	0000	bb00	0001	0000	80cd	90c3	9090
0000180	0ab0	59e8	ffff	c3ff	3004	51e8	ffff	c3ff

0000190	003d	0000	7580	b04e	e82d	ff42	ffff	02b0
00001a0	e3e8	ffff	b0ff	e801	ffdc	ffff	04b0	d5e8
00001b0	ffff	b0ff	e807	ffce	ffff	04b0	c7e8	ffff
00001c0	b0ff	e808	ffc0	ffff	03b0	b9e8	ffff	b0ff
00001d0	e806	ffb2	ffff	04b0	abe8	ffff	b0ff	e808
00001e0	ffa4	ffff	3dc3	0000	0000	0b7d	b050	e82d
00001f0	feec	ffff	f758	3dd8	000a	0000	8c0f	00ef
0000200	0000	643d	0000	0f00	d18c	0000	3d00	03e8
0000210	0000	8c0f	00b3	0000	103d	0027	0f00	958c
0000220	0000	3d00	86a0	0001	7b7c	403d	0f42	7c00
0000230	3d61	9680	0098	477c	003d	f5e1	7c05	3d2d
0000240	ca00	3b9a	137c	00ba	0000	bb00	ca00	3b9a
0000250	fbf7	e852	ff30	ffff	ba58	0000	0000	00bb
0000260	f5e1	f705	52fb	1de8	ffff	58ff	00ba	0000
0000270	bb00	9680	0098	fbf7	e852	ff0a	ffff	ba58
0000280	0000	0000	40bb	0f42	f700	52fb	f7e8	fffe
0000290	58ff	00ba	0000	bb00	86a0	0001	fbf7	e852
00002a0	fee4	ffff	ba58	0000	0000	10bb	0027	f700
00002b0	52fb	d1e8	fffe	58ff	00ba	0000	bb00	03e8
00002c0	0000	fbf7	e852	febe	ffff	ba58	0000	0000
00002d0	64bb	0000	f700	52fb	abe8	fffe	58ff	00ba
00002e0	0000	bb00	000a	0000	fbf7	e852	fe98	ffff
00002f0	e858	fe92	ffff	90c3	9090	9090	9090	9090
0000300	01b8	0000	bb00	0000	0000	80cd	9090	9090
0000310	00b9	0000	b300	5103	e853	fdde	ffff	595b
0000320	0a3c	840f	0134	0000	7f3c	840f	0094	0000
0000330	2d3c	840f	0109	0000	303c	db7c	393c	d77f
0000340	302c	fb80	7400	80d0	02fb	0c75	f981	0000
0000350	0000	0475	003c	bf74	fb80	7503	3c0a	7500
0000360	b304	eb00	b302	8101	ccf9	cccc	7f0c	81a8
0000370	34f9	3333	7cf3	88a0	b8c7	000a	0000	e9f7
0000380	083d	0000	7480	3d11	fff8	7fff	1375	ff80
0000390	7e07	e90e	ff7f	ffff	ff80	0f08	768f	ffff
00003a0	b9ff	0000	0000	f988	fb80	7402	0104	ebc1
00003b0	2903	91c8	f888	5351	cbe8	fffd	5bff	e959
00003c0	ff53	ffff	fb80	0f03	4a84	ffff	51ff	b053
00003d0	e808	fd0a	ffff	20b0	03e8	fffd	b0ff	e808
00003e0	fcfc	ffff	595b	fb80	7500	b307	e903	ff25
00003f0	ffff	fb80	7502	810f	00f9	0000	7500	b307
0000400	e903	ff11	ffff	c889	0ab9	0000	ba00	0000
0000410	0000	003d	0000	7d00	f708	f7d8	f7f9	ebd8
0000420	f702	89f9	81c1	00f9	0000	0f00	e685	fffe
0000430	80ff	02fb	840f	fedd	ffff	03b3	d6e9	fffe
0000440	80ff	03fb	850f	fecb	ffff	2db0	5351	8de8
0000450	fffc	5bff	b359	e902	febb	ffff	fb80	0f03
0000460	b284	fffe	80ff	02fb	0c75	f981	0000	0000

```

0000470 840f fea1 ffff e851 fd04 ffff 8959 c3c8
0000480 13bf 0486 e908 0051 0000 01b8 0000 f700
0000490 f7d8 89d8 0087 0000 c300 ebe8 ffff 8bff
00004a0 0087 0000 5000 878b 0000 0000 f75b 50eb
00004b0 878b 0004 0000 395b 7cc3 e905 001a 0000
00004c0 878b 0000 0000 b850 0001 0000 015b 89d8
00004d0 0087 0000 e900 ffc5 ffff b9c3 84ef 0804
00004e0 03ba 0000 e800 fc86 ffff 04e9 0000 4e00
00004f0 203a e800 fe18 ffff 8789 0004 0000 12b9
0000500 0485 ba08 0011 0000 63e8 fffc e9ff 0012
0000510 0000 4152 5a49 4320 4155 5244 4441 2041
0000520 4544 0020 878b 0004 0000 61e8 fffc b9ff
0000530 8543 0804 02ba 0000 e800 fc32 ffff 03e9
0000540 0000 3a00 0020 878b 0004 0000 b850 0000
0000550 0000 395b 7cc3 e905 001a 0000 70b9 0485
0000560 ba08 0005 0000 05e8 fffc e9ff 0006 0000
0000570 5245 4f52 0052 878b 0004 0000 b850 0000
0000580 0000 395b 74c3 e905 000a 0000 00b8 0000
0000590 e800 fbfa ffff 878b 0004 0000 b850 0000
00005a0 0000 395b 7fc3 e905 005d 0000 e9e8 fffe
00005b0 8bff 0087 0000 5000 878b 0000 0000 f75b
00005c0 50eb 878b 0004 0000 395b 75c3 e905 002c
00005d0 0000 878b 0000 0000 b850 0001 0000 935b
00005e0 d829 a9e8 fffb b9ff 85fb 0804 02ba 0000
00005f0 e800 fb7a ffff 03e9 0000 2e00 002e 878b
0000600 0000 0000 87e8 fffb e8ff fb72 ffff ede9
0000610 fffc 00ff 0000 0000 0000 0000
000061b

```

3.6.3. Listado Desensamblado de la sección *.text*

text/BIEN-05: formato del fichero elf32-i386

Desensamblado de la sección *.text*:

080480e0 <.text>:

...

8048480:	bf 13 86 04 08	mov	edi,0x8048613
8048485:	e9 51 00 00 00	jmp	0x80484db
804848a:	b8 01 00 00 00	mov	eax,0x1
804848f:	f7 d8	neg	eax
8048491:	f7 d8	neg	eax
8048493:	89 87 00 00 00 00	mov	DWORD PTR [edi+0x0],eax
8048499:	c3	ret	
804849a:	e8 eb ff ff ff	call	0x804848a

804849f:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
80484a5:	50	push	eax
80484a6:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
80484ac:	5b	pop	ebx
80484ad:	f7 eb	imul	ebx
80484af:	50	push	eax
80484b0:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
80484b6:	5b	pop	ebx
80484b7:	39 c3	cmp	ebx, eax
80484b9:	7c 05	j1	0x80484c0
80484bb:	e9 1a 00 00 00	jmp	0x80484da
80484c0:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
80484c6:	50	push	eax
80484c7:	b8 01 00 00 00	mov	eax, 0x1
80484cc:	5b	pop	ebx
80484cd:	01 d8	add	eax, ebx
80484cf:	89 87 00 00 00 00	mov	DWORD PTR [edi+0x0], eax
80484d5:	e9 c5 ff ff ff	jmp	0x804849f
80484da:	c3	ret	
80484db:	b9 ef 84 04 08	mov	ecx, 0x80484ef
80484e0:	ba 03 00 00 00	mov	edx, 0x3
80484e5:	e8 86 fc ff ff	call	0x8048170
80484ea:	e9 04 00 00 00	jmp	0x80484f3
80484ef:	4e	dec	esi
80484f0:	3a 20	cmp	ah, BYTE PTR [eax]
80484f2:	00 e8	add	al, ch
80484f4:	18 fe	sbb	dh, bh
80484f6:	ff	(bad)	
80484f7:	ff 89 87 04 00 00	dec	DWORD PTR [ecx+0x487]
80484fd:	00 b9 12 85 04 08	add	BYTE PTR [ecx+0x8048512], bh
8048503:	ba 11 00 00 00	mov	edx, 0x11
8048508:	e8 63 fc ff ff	call	0x8048170
804850d:	e9 12 00 00 00	jmp	0x8048524
8048512:	52	push	edx
8048513:	41	inc	ecx
8048514:	49	dec	ecx
8048515:	5a	pop	edx
8048516:	20 43 55	and	BYTE PTR [ebx+0x55], al
8048519:	41	inc	ecx
804851a:	44	inc	esp
804851b:	52	push	edx
804851c:	41	inc	ecx
804851d:	44	inc	esp
804851e:	41	inc	ecx
804851f:	20 44 45 20	and	BYTE PTR [ebp+eax*2+0x20], al
8048523:	00 8b 87 04 00 00	add	BYTE PTR [ebx+0x487], cl

8048529:	00 e8	add	al,ch
804852b:	61	popa	
804852c:	fc	cld	
804852d:	ff	(bad)	
804852e:	ff	(bad)	
804852f:	b9 43 85 04 08	mov	ecx,0x8048543
8048534:	ba 02 00 00 00	mov	edx,0x2
8048539:	e8 32 fc ff ff	call	0x8048170
804853e:	e9 03 00 00 00	jmp	0x8048546
8048543:	3a 20	cmp	ah,BYTE PTR [eax]
8048545:	00 8b 87 04 00 00	add	BYTE PTR [ebx+0x487],cl
804854b:	00 50 b8	add	BYTE PTR [eax-0x48],dl
804854e:	00 00	add	BYTE PTR [eax],al
8048550:	00 00	add	BYTE PTR [eax],al
8048552:	5b	pop	ebx
8048553:	39 c3	cmp	ebx,eax
8048555:	7c 05	j1	0x804855c
8048557:	e9 1a 00 00 00	jmp	0x8048576
804855c:	b9 70 85 04 08	mov	ecx,0x8048570
8048561:	ba 05 00 00 00	mov	edx,0x5
8048566:	e8 05 fc ff ff	call	0x8048170
804856b:	e9 06 00 00 00	jmp	0x8048576
8048570:	45	inc	ebp
8048571:	52	push	edx
8048572:	52	push	edx
8048573:	4f	dec	edi
8048574:	52	push	edx
8048575:	00 8b 87 04 00 00	add	BYTE PTR [ebx+0x487],cl
804857b:	00 50 b8	add	BYTE PTR [eax-0x48],dl
804857e:	00 00	add	BYTE PTR [eax],al
8048580:	00 00	add	BYTE PTR [eax],al
8048582:	5b	pop	ebx
8048583:	39 c3	cmp	ebx,eax
8048585:	74 05	je	0x804858c
8048587:	e9 0a 00 00 00	jmp	0x8048596
804858c:	b8 00 00 00 00	mov	eax,0x0
8048591:	e8 fa fb ff ff	call	0x8048190
8048596:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
804859c:	50	push	eax
804859d:	b8 00 00 00 00	mov	eax,0x0
80485a2:	5b	pop	ebx
80485a3:	39 c3	cmp	ebx,eax
80485a5:	7f 05	jg	0x80485ac
80485a7:	e9 5d 00 00 00	jmp	0x8048609
80485ac:	e8 e9 fe ff ff	call	0x804849a
80485b1:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]

80485b7:	50	push	eax
80485b8:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
80485be:	5b	pop	ebx
80485bf:	f7 eb	imul	ebx
80485c1:	50	push	eax
80485c2:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
80485c8:	5b	pop	ebx
80485c9:	39 c3	cmp	ebx,ebx
80485cb:	75 05	jne	0x80485d2
80485cd:	e9 2c 00 00 00	jmp	0x80485fe
80485d2:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
80485d8:	50	push	eax
80485d9:	b8 01 00 00 00	mov	eax,0x1
80485de:	5b	pop	ebx
80485df:	93	xchg	ebx,ebx
80485e0:	29 d8	sub	eax,ebx
80485e2:	e8 a9 fb ff ff	call	0x8048190
80485e7:	b9 fb 85 04 08	mov	ecx,0x80485fb
80485ec:	ba 02 00 00 00	mov	edx,0x2
80485f1:	e8 7a fb ff ff	call	0x8048170
80485f6:	e9 03 00 00 00	jmp	0x80485fe
80485fb:	2e 2e 00 8b 87 00 00	cs add	BYTE PTR cs:[ebx+0x87],cl
8048602:	00		
8048603:	00 e8	add	al,ch
8048605:	87 fb	xchg	ebx,edi
8048607:	ff	(bad)	
8048608:	ff	(bad)	
8048609:	e8 72 fb ff ff	call	0x8048180
804860e:	e9 ed fc ff ff	jmp	0x8048300
...			

3.7. BIEN-06

3.7.1. Código Fuente

```
var IMPORTE, BILLETE, VUELTO, PESOS, CENTAVOS, VUELTOPEOS, VUELTOCENTAVOS,
    IMPORTEOK, CENTAVOSOK, PESOSOK, BILLETEOK, VUELTOOK;
```

```
procedure ERROR;
begin
    writeln ('VALOR FUERA DE RANGO!')
end;
```

```
begin
    WRITELN ('*****');
    writeLn ('VUELTO PARA IMPORTES PAGADOS CON UN BILLETE');
    WRITELN ('*****');
```

```

writeln;
IMPORTEOK := -1;
while IMPORTEOK <> 0 do
begin
    writeln ('IMPORTE (min $0.01 y max $100.00)');
    CENTAVOSOK := -1;
    while CENTAVOSOK <> 0 do
    begin
        write ('CENTAVOS: '); readLn (CENTAVOS);
        CENTAVOSOK := 0;
        if CENTAVOS < 0 then CENTAVOSOK := -1;
        if CENTAVOS > 99 then CENTAVOSOK := -1;
        if CENTAVOSOK <> 0 then call ERROR
    end;
    PESOSOK := -1;
    while PESOSOK <> 0 do
    begin
        write ('PESOS: '); readLn (PESOS);
        PESOSOK := 0;
        if PESOS < 0 then PESOSOK := -1;
        if PESOS > 100 then PESOSOK := -1;
        if PESOSOK <> 0 then call ERROR
    end;
    write ('IMPORTE: $', PESOS, '.');
    if CENTAVOS < 10 then write ('0');
    writeln (CENTAVOS);
    IMPORTE := PESOS * 100 + CENTAVOS;
    IMPORTEOK := 0;
    if IMPORTE < 1 then IMPORTEOK := -1;
    if IMPORTE > 10000 then IMPORTEOK := -1;
    if IMPORTEOK <> 0 then call ERROR
end;

VUELTOOK := -1;
while VUELTOOK <> 0 do
begin
    BILLETEOK := -1;
    while BILLETEOK <> 0 do
    begin
        write ('BILLETE (min $2 y max $100): $'); readLn (BILLETE);
        BILLETEOK := -1;
        if BILLETE = 2 then BILLETEOK := 0;
        if BILLETE = 5 then BILLETEOK := 0;
        if BILLETE = 10 then BILLETEOK := 0;
        if BILLETE = 20 then BILLETEOK := 0;
        if BILLETE = 50 then BILLETEOK := 0;
        if BILLETE = 100 then BILLETEOK := 0;
        if BILLETEOK <> 0 then writeln ('BILLETE INEXISTENTE!')
    end;
end;

```



```

VUELTO := BILLETE * 100 - IMPORTE;
VUELTOOK := 0;
if VUELTO < 0 then
begin
    VUELTOOK := -1;
    writeLn ('BILLETE INSUFICIENTE PARA EL PAGO!')
end
end;

VUELTOPEOSOS := VUELTO / 100;
VUELTOCENTAVOS := VUELTO - VUELTOPEOSOS * 100;

write ('Su vuelto: $', VUELTOPEOSOS, '.');
if VUELTOCENTAVOS < 10 then write ('0');
writeLn (VUELTOCENTAVOS);

writeLn;

if VUELTO >= 5000 then
begin
    writeLn ('1 billete de $50');
    VUELTO := VUELTO - 5000
end;

if VUELTO >= 2000 then
begin
    if VUELTO / 2000 = 1 then writeLn ('1 billete de $20');
    if VUELTO / 2000 <> 1 then writeLn ('2 billetes de $20');
    VUELTO := VUELTO - VUELTO / 2000 * 2000
end;

if VUELTO >= 1000 then
begin
    writeLn ('1 billete de $10');
    VUELTO := VUELTO - 1000
end;

if VUELTO >= 500 then
begin
    writeLn ('1 billete de $5');
    VUELTO := VUELTO - 500
end;

if VUELTO >= 200 then
begin
    if VUELTO / 200 = 1 then writeLn ('1 billete de $2');
    if VUELTO / 200 <> 1 then writeLn ('2 billetes de $2');
    VUELTO := VUELTO - VUELTO / 200 * 200
end;

```

```

if VUELTO >= 100 then
begin
  writeln ('1 moneda de $1');
  VUELTO := VUELTO - 100
end;

if VUELTO >= 50 then
begin
  writeln ('1 moneda de 50 centavos');
  VUELTO := VUELTO - 50
end;

if VUELTO >= 25 then
begin
  writeln ('1 moneda de 25 centavos');
  VUELTO := VUELTO - 25
end;

if VUELTO >= 10 then
begin
  if VUELTO / 10 = 1 then writeln ('1 moneda de 10 centavos');
  if VUELTO / 10 <> 1 then writeln ('2 monedas de 10 centavos');
  VUELTO := VUELTO - VUELTO / 10 * 10
end;

if VUELTO >= 5 then
begin
  writeln ('1 moneda de 5 centavos');
  VUELTO := VUELTO - 5
end;

if VUELTO > 1 then writeln (VUELTO, ' monedas de 1 centavo');
if VUELTO = 1 then writeln ('1 moneda de 1 centavo')

end.

```

3.7.2. Contenido Hexadecimal Completo

```

0000000 457f 464c 0101 0001 0000 0000 0000 0000
0000010 0002 0003 0001 0000 8480 0804 0034 0000
0000020 0065 0000 0000 0000 0000 0034 0020 0001 0028
0000030 0003 0001 0001 0000 0000 0000 0000 8000 0804
0000040 8000 0804 1123 0000 1123 0000 0007 0000
0000050 1000 0000 2e00 6873 7473 7472 6261 2e00
0000060 6574 7478 0000 0000 0000 0000 0000 0000
0000070 0000 0000 0000 0000 0000 0000 0000 0000
0000080 0000 0000 0000 0000 0000 0000 0100 0000

```

0000090	0300	0000	0000	0000	0000	0000	5400	0000
00000a0	1100	0000	0000	0000	0000	0000	0100	0000
00000b0	0000	0000	0b00	0000	0100	0000	0600	0000
00000c0	e000	0480	e008	0000	4300	0010	0000	0000
00000d0	0000	0000	0100	0000	0000	0000	0000	0000
00000e0	5152	5053	04b8	0000	bb00	0001	0000	e189
00000f0	01ba	0000	cd00	5880	595b	c35a	8955	81e5
0000100	24ec	0000	5200	5351	36b8	0000	bb00	0000
0000110	0000	01b9	0054	8d00	dc55	80cd	6581	f5e8
0000120	ffff	b8ff	0036	0000	00bb	0000	b900	5402
0000130	0000	558d	cddc	3180	50c0	03b8	0000	bb00
0000140	0000	0000	e189	01ba	0000	cd00	8180	e84d
0000150	000a	0000	36b8	0000	bb00	0000	0000	02b9
0000160	0054	8d00	dc55	80cd	5b58	5a59	ec89	c35d
0000170	04b8	0000	bb00	0001	0000	80cd	90c3	9090
0000180	0ab0	59e8	ffff	c3ff	3004	51e8	ffff	c3ff
0000190	003d	0000	7580	b04e	e82d	ff42	ffff	02b0
00001a0	e3e8	ffff	b0ff	e801	ffdc	ffff	04b0	d5e8
00001b0	ffff	b0ff	e807	ffce	ffff	04b0	c7e8	ffff
00001c0	b0ff	e808	ffc0	ffff	03b0	b9e8	ffff	b0ff
00001d0	e806	ffb2	ffff	04b0	abe8	ffff	b0ff	e808
00001e0	ffa4	ffff	3dc3	0000	0000	0b7d	b050	e82d
00001f0	feec	ffff	f758	3dd8	000a	0000	8c0f	00ef
0000200	0000	643d	0000	0f00	d18c	0000	3d00	03e8
0000210	0000	8c0f	00b3	0000	103d	0027	0f00	958c
0000220	0000	3d00	86a0	0001	7b7c	403d	0f42	7c00
0000230	3d61	9680	0098	477c	003d	f5e1	7c05	3d2d
0000240	ca00	3b9a	137c	00ba	0000	bb00	ca00	3b9a
0000250	fbf7	e852	ff30	ffff	ba58	0000	0000	00bb
0000260	f5e1	f705	52fb	1de8	ffff	58ff	00ba	0000
0000270	bb00	9680	0098	fbf7	e852	ff0a	ffff	ba58
0000280	0000	0000	40bb	0f42	f700	52fb	f7e8	fffe
0000290	58ff	00ba	0000	bb00	86a0	0001	fbf7	e852
00002a0	fee4	ffff	ba58	0000	0000	10bb	0027	f700
00002b0	52fb	d1e8	fffe	58ff	00ba	0000	bb00	03e8
00002c0	0000	fbf7	e852	febe	ffff	ba58	0000	0000
00002d0	64bb	0000	f700	52fb	abe8	fffe	58ff	00ba
00002e0	0000	bb00	000a	0000	fbf7	e852	fe98	ffff
00002f0	e858	fe92	ffff	90c3	9090	9090	9090	9090
0000300	01b8	0000	bb00	0000	0000	80cd	9090	9090
0000310	00b9	0000	b300	5103	e853	fdde	ffff	595b
0000320	0a3c	840f	0134	0000	7f3c	840f	0094	0000
0000330	2d3c	840f	0109	0000	303c	db7c	393c	d77f
0000340	302c	fb80	7400	80d0	02fb	0c75	f981	0000
0000350	0000	0475	003c	bf74	fb80	7503	3c0a	7500
0000360	b304	eb00	b302	8101	ccf9	cccc	7f0c	81a8

```

0000370 34f9 3333 7cf3 88a0 b8c7 000a 0000 e9f7
0000380 083d 0000 7480 3d11 fff8 7fff 1375 ff80
0000390 7e07 e90e ff7f ffff ff80 0f08 768f ffff
00003a0 b9ff 0000 0000 f988 fb80 7402 0104 ebc1
00003b0 2903 91c8 f888 5351 cbe8 fffd 5bff e959
00003c0 ff53 ffff fb80 0f03 4a84 ffff 51ff b053
00003d0 e808 fd0a ffff 20b0 03e8 fffd b0ff e808
00003e0 fcf3 ffff 595b fb80 7500 b307 e903 ff25
00003f0 ffff fb80 7502 810f 00f9 0000 7500 b307
0000400 e903 ff11 ffff c889 0ab9 0000 ba00 0000
0000410 0000 003d 0000 7d00 f708 f7d8 f7f9 ebd8
0000420 f702 89f9 81c1 00f9 0000 0f00 e685 fffe
0000430 80ff 02fb 840f fedd ffff 03b3 d6e9 fffe
0000440 80ff 03fb 850f fecd ffff 2db0 5351 8de8
0000450 fffc 5bff b359 e902 febb ffff fb80 0f03
0000460 b284 fffe 80ff 02fb 0c75 f981 0000 0000
0000470 840f fea1 ffff e851 fd04 ffff 8959 c3c8
0000480 f3bf 0490 e908 0030 0000 9eb9 0484 ba08
0000490 0015 0000 d7e8 fffc e9ff 0016 0000 4156
00004a0 4f4c 2052 5546 5245 2041 4544 5220 4e41
00004b0 4f47 0021 c7e8 fffc c3ff ceb9 0484 ba08
00004c0 002b 0000 a7e8 fffc e9ff 002c 0000 2a2a
00004d0 2a2a 2a2a 2a2a 2a2a 2a2a 2a2a 2a2a 2a2a
*
00004f0 2a2a 2a2a 2a2a 2a2a 002a 81e8 fffc b9ff
0000500 8513 0804 2bba 0000 e800 fc62 ffff 2ce9
0000510 0000 5600 4555 544c 204f 4150 4152 4920
0000520 504d 524f 4554 2053 4150 4147 4f44 2053
0000530 4f43 204e 4e55 4220 4c49 454c 4554 e800
0000540 fc3c ffff 58b9 0485 ba08 002b 0000 1de8
0000550 fffc e9ff 002c 0000 2a2a 2a2a 2a2a 2a2a
0000560 2a2a 2a2a 2a2a 2a2a 2a2a 2a2a 2a2a 2a2a
*
0000580 2a2a 002a f7e8 fffb e8ff fbf2 ffff 01b8
0000590 0000 f700 89d8 1c87 0000 8b00 1c87 0000
00005a0 5000 00b8 0000 5b00 c339 0575 c0e9 0002
00005b0 b900 85c5 0804 21ba 0000 e800 fbb0 ffff
00005c0 22e9 0000 4900 504d 524f 4554 2820 696d
00005d0 206e 3024 302e 2031 2079 616d 2078 3124
00005e0 3030 302e 2930 e800 fb94 ffff 01b8 0000
00005f0 f700 89d8 2087 0000 8b00 2087 0000 5000
0000600 00b8 0000 5b00 c339 0575 9be9 0000 b900
0000610 8623 0804 0aba 0000 e800 fb52 ffff 0be9
0000620 0000 4300 4e45 4154 4f56 3a53 0020 dde8
0000630 fffc 89ff 1087 0000 b800 0000 0000 8789
0000640 0020 0000 878b 0010 0000 b850 0000 0000

```

0000650	395b	7cc3	e905	000d	0000	01b8	0000	f700
0000660	89d8	2087	0000	8b00	1087	0000	5000	63b8
0000670	0000	5b00	c339	057f	0de9	0000	b800	0001
0000680	0000	d8f7	8789	0020	0000	878b	0020	0000
0000690	b850	0000	0000	395b	75c3	e905	0005	0000
00006a0	e5e8	ffff	e9ff	ff4f	ffff	01b8	0000	f700
00006b0	89d8	2487	0000	8b00	2487	0000	5000	00b8
00006c0	0000	5b00	c339	0575	98e9	0000	b900	86e1
00006d0	0804	07ba	0000	e800	fa94	ffff	08e9	0000
00006e0	5000	5345	534f	203a	e800	fc22	ffff	8789
00006f0	000c	0000	00b8	0000	8900	2487	0000	8b00
0000700	0c87	0000	5000	00b8	0000	5b00	c339	057c
0000710	0de9	0000	b800	0001	0000	d8f7	8789	0024
0000720	0000	878b	000c	0000	b850	0064	0000	395b
0000730	7fc3	e905	000d	0000	01b8	0000	f700	89d8
0000740	2487	0000	8b00	2487	0000	5000	00b8	0000
0000750	5b00	c339	0575	05e9	0000	e800	fd2a	ffff
0000760	52e9	ffff	b9ff	8779	0804	0aba	0000	e800
0000770	f9fc	ffff	0be9	0000	4900	504d	524f	4554
0000780	203a	0024	878b	000c	0000	01e8	fffa	b9ff
0000790	87a3	0804	01ba	0000	e800	f9d2	ffff	02e9
00007a0	0000	2e00	8b00	1087	0000	5000	0ab8	0000
00007b0	5b00	c339	057c	16e9	0000	b900	87cf	0804
00007c0	01ba	0000	e800	f9a6	ffff	02e9	0000	3000
00007d0	8b00	1087	0000	e800	f9b4	ffff	9fe8	fff9
00007e0	8bff	0c87	0000	5000	64b8	0000	5b00	ebf7
00007f0	8b50	1087	0000	5b00	d801	8789	0000	0000
0000800	00b8	0000	8900	1c87	0000	8b00	0087	0000
0000810	5000	01b8	0000	5b00	c339	057c	0de9	0000
0000820	b800	0001	0000	d8f7	8789	001c	0000	878b
0000830	0000	0000	b850	2710	0000	395b	7fc3	e905
0000840	000d	0000	01b8	0000	f700	89d8	1c87	0000
0000850	8b00	1c87	0000	5000	00b8	0000	5b00	c339
0000860	0575	05e9	0000	e800	fc1e	ffff	2ae9	ffff
0000870	b8ff	0001	0000	d8f7	8789	002c	0000	878b
0000880	002c	0000	b850	0000	0000	395b	75c3	e905
0000890	020c	0000	01b8	0000	f700	89d8	2887	0000
00008a0	8b00	2887	0000	5000	00b8	0000	5b00	c339
00008b0	0575	5ae9	0001	b900	88cb	0804	1eba	0000
00008c0	e800	f8aa	ffff	1fe9	0000	4200	4c49	454c
00008d0	4554	2820	696d	206e	3224	7920	6d20	7861
00008e0	2420	3031	2930	203a	0024	21e8	fffa	89ff
00008f0	0487	0000	b800	0001	0000	d8f7	8789	0028
0000900	0000	878b	0004	0000	b850	0002	0000	395b
0000910	74c3	e905	000b	0000	00b8	0000	8900	2887
0000920	0000	8b00	0487	0000	5000	05b8	0000	5b00

0000930	c339	0574	0be9	0000	b800	0000	0000	8789
0000940	0028	0000	878b	0004	0000	b850	000a	0000
0000950	395b	74c3	e905	000b	0000	00b8	0000	8900
0000960	2887	0000	8b00	0487	0000	5000	14b8	0000
0000970	5b00	c339	0574	0be9	0000	b800	0000	0000
0000980	8789	0028	0000	878b	0004	0000	b850	0032
0000990	0000	395b	74c3	e905	000b	0000	00b8	0000
00009a0	8900	2887	0000	8b00	0487	0000	5000	64b8
00009b0	0000	5b00	c339	0574	0be9	0000	b800	0000
00009c0	0000	8789	0028	0000	878b	0028	0000	b850
00009d0	0000	0000	395b	75c3	e905	002e	0000	f2b9
00009e0	0489	ba08	0014	0000	83e8	fff7	e9ff	0015
00009f0	0000	4942	4c4c	5445	2045	4e49	5845	5349
0000a00	4554	544e	2145	e800	f774	ffff	90e9	fffe
0000a10	8bff	0487	0000	5000	64b8	0000	5b00	ebf7
0000a20	8b50	0087	0000	5b00	2993	89d8	0887	0000
0000a30	b800	0000	0000	8789	002c	0000	878b	0008
0000a40	0000	b850	0000	0000	395b	7cc3	e905	0049
0000a50	0000	01b8	0000	f700	89d8	2c87	0000	b900
0000a60	8a73	0804	22ba	0000	e800	f702	ffff	23e9
0000a70	0000	4200	4c49	454c	4554	4920	534e	4655
0000a80	4349	4549	544e	2045	4150	4152	4520	204c
0000a90	4150	4f47	0021	e5e8	fff6	e9ff	fdde	ffff
0000aa0	878b	0008	0000	b850	0064	0000	935b	f799
0000ab0	89fb	1487	0000	8b00	0887	0000	5000	878b
0000ac0	0014	0000	b850	0064	0000	f75b	5beb	2993
0000ad0	89d8	1887	0000	b900	8aeb	0804	0cba	0000
0000ae0	e800	f68a	ffff	0de9	0000	5300	2075	7576
0000af0	6c65	6f74	203a	0024	878b	0014	0000	8de8
0000b00	fff6	b9ff	8b17	0804	01ba	0000	e800	f65e
0000b10	ffff	02e9	0000	2e00	8b00	1887	0000	5000
0000b20	0ab8	0000	5b00	c339	057c	16e9	0000	b900
0000b30	8b43	0804	01ba	0000	e800	f632	ffff	02e9
0000b40	0000	3000	8b00	1887	0000	e800	f640	ffff
0000b50	2be8	fff6	e8ff	f626	ffff	878b	0008	0000
0000b60	b850	1388	0000	395b	7dc3	e905	0040	0000
0000b70	84b9	048b	ba08	0010	0000	f1e8	fff5	e9ff
0000b80	0011	0000	2031	6962	6c6c	7465	2065	6564
0000b90	2420	3035	e800	f5e6	ffff	878b	0008	0000
0000ba0	b850	1388	0000	935b	d829	8789	0008	0000
0000bb0	878b	0008	0000	b850	07d0	0000	395b	7dc3
0000bc0	e905	00c2	0000	878b	0008	0000	b850	07d0
0000bd0	0000	935b	f799	50fb	01b8	0000	5b00	c339
0000be0	0574	2ae9	0000	b900	8bfb	0804	10ba	0000
0000bf0	e800	f57a	ffff	11e9	0000	3100	6220	6c69
0000c00	656c	6574	6420	2065	3224	0030	6fe8	fff5

0000c10	8bff	0887	0000	5000	d0b8	0007	5b00	9993
0000c20	fbf7	b850	0001	0000	395b	75c3	e905	002b
0000c30	0000	46b9	048c	ba08	0011	0000	2fe8	fff5
0000c40	e9ff	0012	0000	2032	6962	6c6c	7465	7365
0000c50	6420	2065	3224	0030	23e8	fff5	8bff	0887
0000c60	0000	5000	878b	0008	0000	b850	07d0	0000
0000c70	935b	f799	50fb	d0b8	0007	5b00	ebf7	935b
0000c80	d829	8789	0008	0000	878b	0008	0000	b850
0000c90	03e8	0000	395b	7dc3	e905	0040	0000	b2b9
0000ca0	048c	ba08	0010	0000	c3e8	fff4	e9ff	0011
0000cb0	0000	2031	6962	6c6c	7465	2065	6564	2420
0000cc0	3031	e800	f4b8	ffff	878b	0008	0000	b850
0000cd0	03e8	0000	935b	d829	8789	0008	0000	878b
0000ce0	0008	0000	b850	01f4	0000	395b	7dc3	e905
0000cf0	003f	0000	08b9	048d	ba08	000f	0000	6de8
0000d00	fff4	e9ff	0010	0000	2031	6962	6c6c	7465
0000d10	2065	6564	2420	0035	63e8	fff4	8bff	0887
0000d20	0000	5000	f4b8	0001	5b00	2993	89d8	0887
0000d30	0000	8b00	0887	0000	5000	c8b8	0000	5b00
0000d40	c339	057d	c0e9	0000	8b00	0887	0000	5000
0000d50	c8b8	0000	5b00	9993	fbf7	b850	0001	0000
0000d60	395b	74c3	e905	0029	0000	7eb9	048d	ba08
0000d70	000f	0000	f7e8	fff3	e9ff	0010	0000	2031
0000d80	6962	6c6c	7465	2065	6564	2420	0032	ede8
0000d90	fff3	8bff	0887	0000	5000	c8b8	0000	5b00
0000da0	9993	fbf7	b850	0001	0000	395b	75c3	e905
0000db0	002a	0000	c8b9	048d	ba08	0010	0000	ade8
0000dc0	fff3	e9ff	0011	0000	2032	6962	6c6c	7465
0000dd0	7365	6420	2065	3224	e800	f3a2	ffff	878b
0000de0	0008	0000	8b50	0887	0000	5000	c8b8	0000
0000df0	5b00	9993	fbf7	b850	00c8	0000	f75b	5beb
0000e00	2993	89d8	0887	0000	8b00	0887	0000	5000
0000e10	64b8	0000	5b00	c339	057d	3ee9	0000	b900
0000e20	8e33	0804	0eba	0000	e800	f342	ffff	0fe9
0000e30	0000	3100	6d20	6e6f	6465	2061	6564	2420
0000e40	0031	39e8	fff3	8bff	0887	0000	5000	64b8
0000e50	0000	5b00	2993	89d8	0887	0000	8b00	0887
0000e60	0000	5000	32b8	0000	5b00	c339	057d	47e9
0000e70	0000	b900	8e87	0804	17ba	0000	e800	f2ee
0000e80	ffff	18e9	0000	3100	6d20	6e6f	6465	2061
0000e90	6564	3520	2030	6563	746e	7661	736f	e800
0000ea0	f2dc	ffff	878b	0008	0000	b850	0032	0000
0000eb0	935b	d829	8789	0008	0000	878b	0008	0000
0000ec0	b850	0019	0000	395b	7dc3	e905	0047	0000
0000ed0	e4b9	048e	ba08	0017	0000	91e8	fff2	e9ff
0000ee0	0018	0000	2031	6f6d	656e	6164	6420	2065

```

0000ef0 3532 6320 6e65 6174 6f76 0073 7fe8 fff2
0000f00 8bff 0887 0000 5000 19b8 0000 5b00 2993
0000f10 89d8 0887 0000 8b00 0887 0000 5000 0ab8
0000f20 0000 5b00 c339 057d d0e9 0000 8b00 0887
0000f30 0000 5000 0ab8 0000 5b00 9993 fbf7 b850
0000f40 0001 0000 395b 74c3 e905 0031 0000 62b9
0000f50 048f ba08 0017 0000 13e8 fff2 e9ff 0018
0000f60 0000 2031 6f6d 656e 6164 6420 2065 3031
0000f70 6320 6e65 6174 6f76 0073 01e8 fff2 8bff
0000f80 0887 0000 5000 0ab8 0000 5b00 9993 fbf7
0000f90 b850 0001 0000 395b 75c3 e905 0032 0000
0000fa0 b4b9 048f ba08 0018 0000 c1e8 fff1 e9ff
0000fb0 0019 0000 2032 6f6d 656e 6164 2073 6564
0000fc0 3120 2030 6563 746e 7661 736f e800 f1ae
0000fd0 ffff 878b 0008 0000 8b50 0887 0000 5000
0000fe0 0ab8 0000 5b00 9993 fbf7 b850 000a 0000
0000ff0 f75b 5beb 2993 89d8 0887 0000 8b00 0887
0001000 0000 5000 05b8 0000 5b00 c339 057d 46e9
0001010 0000 b900 9027 0804 16ba 0000 e800 f14e
0001020 ffff 17e9 0000 3100 6d20 6e6f 6465 2061
0001030 6564 3520 6320 6e65 6174 6f76 0073 3de8
0001040 fff1 8bff 0887 0000 5000 05b8 0000 5b00
0001050 2993 89d8 0887 0000 8b00 0887 0000 5000
0001060 01b8 0000 5b00 c339 057f 3ae9 0000 8b00
0001070 0887 0000 e800 f116 ffff 8eb9 0490 ba08
0001080 0015 0000 e7e8 fff0 e9ff 0016 0000 6d20
0001090 6e6f 6465 7361 6420 2065 2031 6563 746e
00010a0 7661 006f d7e8 fff0 8bff 0887 0000 5000
00010b0 01b8 0000 5b00 c339 0574 2fe9 0000 b900
00010c0 90d3 0804 15ba 0000 e800 f0a2 ffff 16e9
00010d0 0000 3100 6d20 6e6f 6465 2061 6564 3120
00010e0 6320 6e65 6174 6f76 e800 f092 ffff 0de9
00010f0 fff2 00ff 0000 0000 0000 0000 0000 0000
0001100 0000 0000 0000 0000 0000 0000 0000 0000

```

*

```
0001123
```

3.7.3. Listado Desensamblado de la sección *.text*

```
text/BIEN-06:      formato del fichero elf32-i386
```

Desensamblado de la sección *.text*:

```
080480e0 <.text>:
```

```
...
```


8048480:	bf f3 90 04 08	mov	edi,0x80490f3
8048485:	e9 30 00 00 00	jmp	0x80484ba
804848a:	b9 9e 84 04 08	mov	ecx,0x804849e
804848f:	ba 15 00 00 00	mov	edx,0x15
8048494:	e8 d7 fc ff ff	call	0x8048170
8048499:	e9 16 00 00 00	jmp	0x80484b4
804849e:	56	push	esi
804849f:	41	inc	ecx
80484a0:	4c	dec	esp
80484a1:	4f	dec	edi
80484a2:	52	push	edx
80484a3:	20 46 55	and	BYTE PTR [esi+0x55],al
80484a6:	45	inc	ebp
80484a7:	52	push	edx
80484a8:	41	inc	ecx
80484a9:	20 44 45 20	and	BYTE PTR [ebp+eax*2+0x20],al
80484ad:	52	push	edx
80484ae:	41	inc	ecx
80484af:	4e	dec	esi
80484b0:	47	inc	edi
80484b1:	4f	dec	edi
80484b2:	21 00	and	DWORD PTR [eax],eax
80484b4:	e8 c7 fc ff ff	call	0x8048180
80484b9:	c3	ret	
80484ba:	b9 ce 84 04 08	mov	ecx,0x80484ce
80484bf:	ba 2b 00 00 00	mov	edx,0x2b
80484c4:	e8 a7 fc ff ff	call	0x8048170
80484c9:	e9 2c 00 00 00	jmp	0x80484fa
80484ce:	2a 2a	sub	ch,BYTE PTR [edx]
80484d0:	2a 2a	sub	ch,BYTE PTR [edx]
80484d2:	2a 2a	sub	ch,BYTE PTR [edx]
80484d4:	2a 2a	sub	ch,BYTE PTR [edx]
80484d6:	2a 2a	sub	ch,BYTE PTR [edx]
80484d8:	2a 2a	sub	ch,BYTE PTR [edx]
80484da:	2a 2a	sub	ch,BYTE PTR [edx]
80484dc:	2a 2a	sub	ch,BYTE PTR [edx]
80484de:	2a 2a	sub	ch,BYTE PTR [edx]
80484e0:	2a 2a	sub	ch,BYTE PTR [edx]
80484e2:	2a 2a	sub	ch,BYTE PTR [edx]
80484e4:	2a 2a	sub	ch,BYTE PTR [edx]
80484e6:	2a 2a	sub	ch,BYTE PTR [edx]
80484e8:	2a 2a	sub	ch,BYTE PTR [edx]
80484ea:	2a 2a	sub	ch,BYTE PTR [edx]
80484ec:	2a 2a	sub	ch,BYTE PTR [edx]
80484ee:	2a 2a	sub	ch,BYTE PTR [edx]
80484f0:	2a 2a	sub	ch,BYTE PTR [edx]

80484f2:	2a 2a	sub	ch,BYTE PTR [edx]
80484f4:	2a 2a	sub	ch,BYTE PTR [edx]
80484f6:	2a 2a	sub	ch,BYTE PTR [edx]
80484f8:	2a 00	sub	al,BYTE PTR [eax]
80484fa:	e8 81 fc ff ff	call	0x8048180
80484ff:	b9 13 85 04 08	mov	ecx,0x8048513
8048504:	ba 2b 00 00 00	mov	edx,0x2b
8048509:	e8 62 fc ff ff	call	0x8048170
804850e:	e9 2c 00 00 00	jmp	0x804853f
8048513:	56	push	esi
8048514:	55	push	ebp
8048515:	45	inc	ebp
8048516:	4c	dec	esp
8048517:	54	push	esp
8048518:	4f	dec	edi
8048519:	20 50 41	and	BYTE PTR [eax+0x41],dl
804851c:	52	push	edx
804851d:	41	inc	ecx
804851e:	20 49 4d	and	BYTE PTR [ecx+0x4d],cl
8048521:	50	push	eax
8048522:	4f	dec	edi
8048523:	52	push	edx
8048524:	54	push	esp
8048525:	45	inc	ebp
8048526:	53	push	ebx
8048527:	20 50 41	and	BYTE PTR [eax+0x41],dl
804852a:	47	inc	edi
804852b:	41	inc	ecx
804852c:	44	inc	esp
804852d:	4f	dec	edi
804852e:	53	push	ebx
804852f:	20 43 4f	and	BYTE PTR [ebx+0x4f],al
8048532:	4e	dec	esi
8048533:	20 55 4e	and	BYTE PTR [ebp+0x4e],dl
8048536:	20 42 49	and	BYTE PTR [edx+0x49],al
8048539:	4c	dec	esp
804853a:	4c	dec	esp
804853b:	45	inc	ebp
804853c:	54	push	esp
804853d:	45	inc	ebp
804853e:	00 e8	add	al,ch
8048540:	3c fc	cmp	al,0xfc
8048542:	ff	(bad)	
8048543:	ff	(bad)	
8048544:	b9 58 85 04 08	mov	ecx,0x8048558
8048549:	ba 2b 00 00 00	mov	edx,0x2b

804854e:	e8 1d fc ff ff	call	0x8048170
8048553:	e9 2c 00 00 00	jmp	0x8048584
8048558:	2a 2a	sub	ch,BYTE PTR [edx]
804855a:	2a 2a	sub	ch,BYTE PTR [edx]
804855c:	2a 2a	sub	ch,BYTE PTR [edx]
804855e:	2a 2a	sub	ch,BYTE PTR [edx]
8048560:	2a 2a	sub	ch,BYTE PTR [edx]
8048562:	2a 2a	sub	ch,BYTE PTR [edx]
8048564:	2a 2a	sub	ch,BYTE PTR [edx]
8048566:	2a 2a	sub	ch,BYTE PTR [edx]
8048568:	2a 2a	sub	ch,BYTE PTR [edx]
804856a:	2a 2a	sub	ch,BYTE PTR [edx]
804856c:	2a 2a	sub	ch,BYTE PTR [edx]
804856e:	2a 2a	sub	ch,BYTE PTR [edx]
8048570:	2a 2a	sub	ch,BYTE PTR [edx]
8048572:	2a 2a	sub	ch,BYTE PTR [edx]
8048574:	2a 2a	sub	ch,BYTE PTR [edx]
8048576:	2a 2a	sub	ch,BYTE PTR [edx]
8048578:	2a 2a	sub	ch,BYTE PTR [edx]
804857a:	2a 2a	sub	ch,BYTE PTR [edx]
804857c:	2a 2a	sub	ch,BYTE PTR [edx]
804857e:	2a 2a	sub	ch,BYTE PTR [edx]
8048580:	2a 2a	sub	ch,BYTE PTR [edx]
8048582:	2a 00	sub	al,BYTE PTR [eax]
8048584:	e8 f7 fb ff ff	call	0x8048180
8048589:	e8 f2 fb ff ff	call	0x8048180
804858e:	b8 01 00 00 00	mov	eax,0x1
8048593:	f7 d8	neg	eax
8048595:	89 87 1c 00 00 00	mov	DWORD PTR [edi+0x1c],eax
804859b:	8b 87 1c 00 00 00	mov	eax,DWORD PTR [edi+0x1c]
80485a1:	50	push	eax
80485a2:	b8 00 00 00 00	mov	eax,0x0
80485a7:	5b	pop	ebx
80485a8:	39 c3	cmp	ebx,eax
80485aa:	75 05	jne	0x80485b1
80485ac:	e9 c0 02 00 00	jmp	0x8048871
80485b1:	b9 c5 85 04 08	mov	ecx,0x80485c5
80485b6:	ba 21 00 00 00	mov	edx,0x21
80485bb:	e8 b0 fb ff ff	call	0x8048170
80485c0:	e9 22 00 00 00	jmp	0x80485e7
80485c5:	49	dec	ecx
80485c6:	4d	dec	ebp
80485c7:	50	push	eax
80485c8:	4f	dec	edi
80485c9:	52	push	edx
80485ca:	54	push	esp

```

80485cb: 45
80485cc: 20 28
80485ce: 6d
80485cf: 69 6e 20 24 30 2e 30
80485d6: 31 20
80485d8: 79 20
80485da: 6d
80485db: 61
80485dc: 78 20
80485de: 24 31
80485e0: 30 30
80485e2: 2e 30 30
80485e5: 29 00
80485e7: e8 94 fb ff ff
80485ec: b8 01 00 00 00
80485f1: f7 d8
80485f3: 89 87 20 00 00 00
80485f9: 8b 87 20 00 00 00
80485ff: 50
8048600: b8 00 00 00 00
8048605: 5b
8048606: 39 c3
8048608: 75 05
804860a: e9 9b 00 00 00
804860f: b9 23 86 04 08
8048614: ba 0a 00 00 00
8048619: e8 52 fb ff ff
804861e: e9 0b 00 00 00
8048623: 43
8048624: 45
8048625: 4e
8048626: 54
8048627: 41
8048628: 56
8048629: 4f
804862a: 53
804862b: 3a 20
804862d: 00 e8
804862f: dd fc
8048631: ff
8048632: ff 89 87 10 00 00
8048638: 00 b8 00 00 00 00
804863e: 89 87 20 00 00 00
8048644: 8b 87 10 00 00 00
804864a: 50
804864b: b8 00 00 00 00

```

```

inc     ebp
and     BYTE PTR [eax],ch
ins     DWORD PTR es:[edi],dx
imul    ebp,DWORD PTR [esi+0x20],0x302e3024
xor     DWORD PTR [eax],esp
jns     0x80485fa
ins     DWORD PTR es:[edi],dx
popa
js      0x80485fe
and     al,0x31
xor     BYTE PTR [eax],dh
xor     BYTE PTR cs:[eax],dh
sub     DWORD PTR [eax],eax
call    0x8048180
mov     eax,0x1
neg     eax
mov     DWORD PTR [edi+0x20],eax
mov     eax,DWORD PTR [edi+0x20]
push    eax
mov     eax,0x0
pop     ebx
cmp     ebx,eax
jne     0x804860f
jmp     0x80486aa
mov     ecx,0x8048623
mov     edx,0xa
call    0x8048170
jmp     0x804862e
inc     ebx
inc     ebp
dec     esi
push    esp
inc     ecx
push    esi
dec     edi
push    ebx
cmp     ah,BYTE PTR [eax]
add     al,ch
(bad)
(bad)
dec     DWORD PTR [ecx+0x1087]
add     BYTE PTR [eax+0x0],bh
mov     DWORD PTR [edi+0x20],eax
mov     eax,DWORD PTR [edi+0x10]
push    eax
mov     eax,0x0

```

8048650:	5b	pop	ebx
8048651:	39 c3	cmp	ebx,eax
8048653:	7c 05	j1	0x804865a
8048655:	e9 0d 00 00 00	jmp	0x8048667
804865a:	b8 01 00 00 00	mov	eax,0x1
804865f:	f7 d8	neg	eax
8048661:	89 87 20 00 00 00	mov	DWORD PTR [edi+0x20],eax
8048667:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
804866d:	50	push	eax
804866e:	b8 63 00 00 00	mov	eax,0x63
8048673:	5b	pop	ebx
8048674:	39 c3	cmp	ebx,eax
8048676:	7f 05	jb	0x804867d
8048678:	e9 0d 00 00 00	jmp	0x804868a
804867d:	b8 01 00 00 00	mov	eax,0x1
8048682:	f7 d8	neg	eax
8048684:	89 87 20 00 00 00	mov	DWORD PTR [edi+0x20],eax
804868a:	8b 87 20 00 00 00	mov	eax,DWORD PTR [edi+0x20]
8048690:	50	push	eax
8048691:	b8 00 00 00 00	mov	eax,0x0
8048696:	5b	pop	ebx
8048697:	39 c3	cmp	ebx,eax
8048699:	75 05	jne	0x80486a0
804869b:	e9 05 00 00 00	jmp	0x80486a5
80486a0:	e8 e5 fd ff ff	call	0x804848a
80486a5:	e9 4f ff ff ff	jmp	0x80485f9
80486aa:	b8 01 00 00 00	mov	eax,0x1
80486af:	f7 d8	neg	eax
80486b1:	89 87 24 00 00 00	mov	DWORD PTR [edi+0x24],eax
80486b7:	8b 87 24 00 00 00	mov	eax,DWORD PTR [edi+0x24]
80486bd:	50	push	eax
80486be:	b8 00 00 00 00	mov	eax,0x0
80486c3:	5b	pop	ebx
80486c4:	39 c3	cmp	ebx,eax
80486c6:	75 05	jne	0x80486cd
80486c8:	e9 98 00 00 00	jmp	0x8048765
80486cd:	b9 e1 86 04 08	mov	ecx,0x80486e1
80486d2:	ba 07 00 00 00	mov	edx,0x7
80486d7:	e8 94 fa ff ff	call	0x8048170
80486dc:	e9 08 00 00 00	jmp	0x80486e9
80486e1:	50	push	eax
80486e2:	45	inc	ebp
80486e3:	53	push	ebx
80486e4:	4f	dec	edi
80486e5:	53	push	ebx
80486e6:	3a 20	cmp	ah,BYTE PTR [eax]

80486e8:	00 e8	add	al,ch
80486ea:	22 fc	and	bh,ah
80486ec:	ff	(bad)	
80486ed:	ff 89 87 0c 00 00	dec	DWORD PTR [ecx+0xc87]
80486f3:	00 b8 00 00 00 00	add	BYTE PTR [eax+0x0],bh
80486f9:	89 87 24 00 00 00	mov	DWORD PTR [edi+0x24],eax
80486ff:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
8048705:	50	push	eax
8048706:	b8 00 00 00 00	mov	eax,0x0
804870b:	5b	pop	ebx
804870c:	39 c3	cmp	ebx,eax
804870e:	7c 05	jl	0x8048715
8048710:	e9 0d 00 00 00	jmp	0x8048722
8048715:	b8 01 00 00 00	mov	eax,0x1
804871a:	f7 d8	neg	eax
804871c:	89 87 24 00 00 00	mov	DWORD PTR [edi+0x24],eax
8048722:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
8048728:	50	push	eax
8048729:	b8 64 00 00 00	mov	eax,0x64
804872e:	5b	pop	ebx
804872f:	39 c3	cmp	ebx,eax
8048731:	7f 05	jg	0x8048738
8048733:	e9 0d 00 00 00	jmp	0x8048745
8048738:	b8 01 00 00 00	mov	eax,0x1
804873d:	f7 d8	neg	eax
804873f:	89 87 24 00 00 00	mov	DWORD PTR [edi+0x24],eax
8048745:	8b 87 24 00 00 00	mov	eax,DWORD PTR [edi+0x24]
804874b:	50	push	eax
804874c:	b8 00 00 00 00	mov	eax,0x0
8048751:	5b	pop	ebx
8048752:	39 c3	cmp	ebx,eax
8048754:	75 05	jne	0x804875b
8048756:	e9 05 00 00 00	jmp	0x8048760
804875b:	e8 2a fd ff ff	call	0x804848a
8048760:	e9 52 ff ff ff	jmp	0x80486b7
8048765:	b9 79 87 04 08	mov	ecx,0x8048779
804876a:	ba 0a 00 00 00	mov	edx,0xa
804876f:	e8 fc f9 ff ff	call	0x8048170
8048774:	e9 0b 00 00 00	jmp	0x8048784
8048779:	49	dec	ecx
804877a:	4d	dec	ebp
804877b:	50	push	eax
804877c:	4f	dec	edi
804877d:	52	push	edx
804877e:	54	push	esp
804877f:	45	inc	ebp

8048780:	3a 20	cmp	ah,BYTE PTR [eax]
8048782:	24 00	and	al,0x0
8048784:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
804878a:	e8 01 fa ff ff	call	0x8048190
804878f:	b9 a3 87 04 08	mov	ecx,0x80487a3
8048794:	ba 01 00 00 00	mov	edx,0x1
8048799:	e8 d2 f9 ff ff	call	0x8048170
804879e:	e9 02 00 00 00	jmp	0x80487a5
80487a3:	2e 00 8b 87 10 00 00	add	BYTE PTR cs:[ebx+0x1087],cl
80487aa:	00 50 b8	add	BYTE PTR [eax-0x48],dl
80487ad:	0a 00	or	al,BYTE PTR [eax]
80487af:	00 00	add	BYTE PTR [eax],al
80487b1:	5b	pop	ebx
80487b2:	39 c3	cmp	ebx,eax
80487b4:	7c 05	j1	0x80487bb
80487b6:	e9 16 00 00 00	jmp	0x80487d1
80487bb:	b9 cf 87 04 08	mov	ecx,0x80487cf
80487c0:	ba 01 00 00 00	mov	edx,0x1
80487c5:	e8 a6 f9 ff ff	call	0x8048170
80487ca:	e9 02 00 00 00	jmp	0x80487d1
80487cf:	30 00	xor	BYTE PTR [eax],al
80487d1:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
80487d7:	e8 b4 f9 ff ff	call	0x8048190
80487dc:	e8 9f f9 ff ff	call	0x8048180
80487e1:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
80487e7:	50	push	eax
80487e8:	b8 64 00 00 00	mov	eax,0x64
80487ed:	5b	pop	ebx
80487ee:	f7 eb	imul	ebx
80487f0:	50	push	eax
80487f1:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
80487f7:	5b	pop	ebx
80487f8:	01 d8	add	eax,ebx
80487fa:	89 87 00 00 00 00	mov	DWORD PTR [edi+0x0],eax
8048800:	b8 00 00 00 00	mov	eax,0x0
8048805:	89 87 1c 00 00 00	mov	DWORD PTR [edi+0x1c],eax
804880b:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
8048811:	50	push	eax
8048812:	b8 01 00 00 00	mov	eax,0x1
8048817:	5b	pop	ebx
8048818:	39 c3	cmp	ebx,eax
804881a:	7c 05	j1	0x8048821
804881c:	e9 0d 00 00 00	jmp	0x804882e
8048821:	b8 01 00 00 00	mov	eax,0x1
8048826:	f7 d8	neg	eax
8048828:	89 87 1c 00 00 00	mov	DWORD PTR [edi+0x1c],eax

804882e:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
8048834:	50	push	eax
8048835:	b8 10 27 00 00	mov	eax,0x2710
804883a:	5b	pop	ebx
804883b:	39 c3	cmp	ebx, eax
804883d:	7f 05	jg	0x8048844
804883f:	e9 0d 00 00 00	jmp	0x8048851
8048844:	b8 01 00 00 00	mov	eax,0x1
8048849:	f7 d8	neg	eax
804884b:	89 87 1c 00 00 00	mov	DWORD PTR [edi+0x1c], eax
8048851:	8b 87 1c 00 00 00	mov	eax,DWORD PTR [edi+0x1c]
8048857:	50	push	eax
8048858:	b8 00 00 00 00	mov	eax,0x0
804885d:	5b	pop	ebx
804885e:	39 c3	cmp	ebx, eax
8048860:	75 05	jne	0x8048867
8048862:	e9 05 00 00 00	jmp	0x804886c
8048867:	e8 1e fc ff ff	call	0x804848a
804886c:	e9 2a fd ff ff	jmp	0x804859b
8048871:	b8 01 00 00 00	mov	eax,0x1
8048876:	f7 d8	neg	eax
8048878:	89 87 2c 00 00 00	mov	DWORD PTR [edi+0x2c], eax
804887e:	8b 87 2c 00 00 00	mov	eax,DWORD PTR [edi+0x2c]
8048884:	50	push	eax
8048885:	b8 00 00 00 00	mov	eax,0x0
804888a:	5b	pop	ebx
804888b:	39 c3	cmp	ebx, eax
804888d:	75 05	jne	0x8048894
804888f:	e9 0c 02 00 00	jmp	0x8048aa0
8048894:	b8 01 00 00 00	mov	eax,0x1
8048899:	f7 d8	neg	eax
804889b:	89 87 28 00 00 00	mov	DWORD PTR [edi+0x28], eax
80488a1:	8b 87 28 00 00 00	mov	eax,DWORD PTR [edi+0x28]
80488a7:	50	push	eax
80488a8:	b8 00 00 00 00	mov	eax,0x0
80488ad:	5b	pop	ebx
80488ae:	39 c3	cmp	ebx, eax
80488b0:	75 05	jne	0x80488b7
80488b2:	e9 5a 01 00 00	jmp	0x8048a11
80488b7:	b9 cb 88 04 08	mov	ecx,0x80488cb
80488bc:	ba 1e 00 00 00	mov	edx,0x1e
80488c1:	e8 aa f8 ff ff	call	0x8048170
80488c6:	e9 1f 00 00 00	jmp	0x80488ea
80488cb:	42	inc	edx
80488cc:	49	dec	ecx
80488cd:	4c	dec	esp

80488ce:	4c	dec	esp
80488cf:	45	inc	ebp
80488d0:	54	push	esp
80488d1:	45	inc	ebp
80488d2:	20 28	and	BYTE PTR [eax],ch
80488d4:	6d	ins	DWORD PTR es:[edi],dx
80488d5:	69 6e 20 24 32 20 79	imul	ebp,DWORD PTR [esi+0x20],0x79203224
80488dc:	20 6d 61	and	BYTE PTR [ebp+0x61],ch
80488df:	78 20	js	0x8048901
80488e1:	24 31	and	al,0x31
80488e3:	30 30	xor	BYTE PTR [eax],dh
80488e5:	29 3a	sub	DWORD PTR [edx],edi
80488e7:	20 24 00	and	BYTE PTR [eax+eax*1],ah
80488ea:	e8 21 fa ff ff	call	0x8048310
80488ef:	89 87 04 00 00 00	mov	DWORD PTR [edi+0x4],eax
80488f5:	b8 01 00 00 00	mov	eax,0x1
80488fa:	f7 d8	neg	eax
80488fc:	89 87 28 00 00 00	mov	DWORD PTR [edi+0x28],eax
8048902:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
8048908:	50	push	eax
8048909:	b8 02 00 00 00	mov	eax,0x2
804890e:	5b	pop	ebx
804890f:	39 c3	cmp	ebx,eax
8048911:	74 05	je	0x8048918
8048913:	e9 0b 00 00 00	jmp	0x8048923
8048918:	b8 00 00 00 00	mov	eax,0x0
804891d:	89 87 28 00 00 00	mov	DWORD PTR [edi+0x28],eax
8048923:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
8048929:	50	push	eax
804892a:	b8 05 00 00 00	mov	eax,0x5
804892f:	5b	pop	ebx
8048930:	39 c3	cmp	ebx,eax
8048932:	74 05	je	0x8048939
8048934:	e9 0b 00 00 00	jmp	0x8048944
8048939:	b8 00 00 00 00	mov	eax,0x0
804893e:	89 87 28 00 00 00	mov	DWORD PTR [edi+0x28],eax
8048944:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
804894a:	50	push	eax
804894b:	b8 0a 00 00 00	mov	eax,0xa
8048950:	5b	pop	ebx
8048951:	39 c3	cmp	ebx,eax
8048953:	74 05	je	0x804895a
8048955:	e9 0b 00 00 00	jmp	0x8048965
804895a:	b8 00 00 00 00	mov	eax,0x0
804895f:	89 87 28 00 00 00	mov	DWORD PTR [edi+0x28],eax
8048965:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]

804896b:	50	push	eax
804896c:	b8 14 00 00 00	mov	eax,0x14
8048971:	5b	pop	ebx
8048972:	39 c3	cmp	ebx, eax
8048974:	74 05	je	0x804897b
8048976:	e9 0b 00 00 00	jmp	0x8048986
804897b:	b8 00 00 00 00	mov	eax,0x0
8048980:	89 87 28 00 00 00	mov	DWORD PTR [edi+0x28], eax
8048986:	8b 87 04 00 00 00	mov	eax, DWORD PTR [edi+0x4]
804898c:	50	push	eax
804898d:	b8 32 00 00 00	mov	eax,0x32
8048992:	5b	pop	ebx
8048993:	39 c3	cmp	ebx, eax
8048995:	74 05	je	0x804899c
8048997:	e9 0b 00 00 00	jmp	0x80489a7
804899c:	b8 00 00 00 00	mov	eax,0x0
80489a1:	89 87 28 00 00 00	mov	DWORD PTR [edi+0x28], eax
80489a7:	8b 87 04 00 00 00	mov	eax, DWORD PTR [edi+0x4]
80489ad:	50	push	eax
80489ae:	b8 64 00 00 00	mov	eax,0x64
80489b3:	5b	pop	ebx
80489b4:	39 c3	cmp	ebx, eax
80489b6:	74 05	je	0x80489bd
80489b8:	e9 0b 00 00 00	jmp	0x80489c8
80489bd:	b8 00 00 00 00	mov	eax,0x0
80489c2:	89 87 28 00 00 00	mov	DWORD PTR [edi+0x28], eax
80489c8:	8b 87 28 00 00 00	mov	eax, DWORD PTR [edi+0x28]
80489ce:	50	push	eax
80489cf:	b8 00 00 00 00	mov	eax,0x0
80489d4:	5b	pop	ebx
80489d5:	39 c3	cmp	ebx, eax
80489d7:	75 05	jne	0x80489de
80489d9:	e9 2e 00 00 00	jmp	0x8048a0c
80489de:	b9 f2 89 04 08	mov	ecx,0x80489f2
80489e3:	ba 14 00 00 00	mov	edx,0x14
80489e8:	e8 83 f7 ff ff	call	0x8048170
80489ed:	e9 15 00 00 00	jmp	0x8048a07
80489f2:	42	inc	edx
80489f3:	49	dec	ecx
80489f4:	4c	dec	esp
80489f5:	4c	dec	esp
80489f6:	45	inc	ebp
80489f7:	54	push	esp
80489f8:	45	inc	ebp
80489f9:	20 49 4e	and	BYTE PTR [ecx+0x4e], cl
80489fc:	45	inc	ebp

80489fd:	58	pop	eax
80489fe:	49	dec	ecx
80489ff:	53	push	ebx
8048a00:	54	push	esp
8048a01:	45	inc	ebp
8048a02:	4e	dec	esi
8048a03:	54	push	esp
8048a04:	45	inc	ebp
8048a05:	21 00	and	DWORD PTR [eax],eax
8048a07:	e8 74 f7 ff ff	call	0x8048180
8048a0c:	e9 90 fe ff ff	jmp	0x80488a1
8048a11:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
8048a17:	50	push	eax
8048a18:	b8 64 00 00 00	mov	eax,0x64
8048a1d:	5b	pop	ebx
8048a1e:	f7 eb	imul	ebx
8048a20:	50	push	eax
8048a21:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
8048a27:	5b	pop	ebx
8048a28:	93	xchg	ebx,ebx
8048a29:	29 d8	sub	eax,ebx
8048a2b:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048a31:	b8 00 00 00 00	mov	eax,0x0
8048a36:	89 87 2c 00 00 00	mov	DWORD PTR [edi+0x2c],eax
8048a3c:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048a42:	50	push	eax
8048a43:	b8 00 00 00 00	mov	eax,0x0
8048a48:	5b	pop	ebx
8048a49:	39 c3	cmp	ebx,ebx
8048a4b:	7c 05	j1	0x8048a52
8048a4d:	e9 49 00 00 00	jmp	0x8048a9b
8048a52:	b8 01 00 00 00	mov	eax,0x1
8048a57:	f7 d8	neg	eax
8048a59:	89 87 2c 00 00 00	mov	DWORD PTR [edi+0x2c],eax
8048a5f:	b9 73 8a 04 08	mov	ecx,0x8048a73
8048a64:	ba 22 00 00 00	mov	edx,0x22
8048a69:	e8 02 f7 ff ff	call	0x8048170
8048a6e:	e9 23 00 00 00	jmp	0x8048a96
8048a73:	42	inc	edx
8048a74:	49	dec	ecx
8048a75:	4c	dec	esp
8048a76:	4c	dec	esp
8048a77:	45	inc	ebp
8048a78:	54	push	esp
8048a79:	45	inc	ebp
8048a7a:	20 49 4e	and	BYTE PTR [ecx+0x4e],cl

8048a7d:	53	push	ebx
8048a7e:	55	push	ebp
8048a7f:	46	inc	esi
8048a80:	49	dec	ecx
8048a81:	43	inc	ebx
8048a82:	49	dec	ecx
8048a83:	45	inc	ebp
8048a84:	4e	dec	esi
8048a85:	54	push	esp
8048a86:	45	inc	ebp
8048a87:	20 50 41	and	BYTE PTR [eax+0x41],dl
8048a8a:	52	push	edx
8048a8b:	41	inc	ecx
8048a8c:	20 45 4c	and	BYTE PTR [ebp+0x4c],al
8048a8f:	20 50 41	and	BYTE PTR [eax+0x41],dl
8048a92:	47	inc	edi
8048a93:	4f	dec	edi
8048a94:	21 00	and	DWORD PTR [eax],eax
8048a96:	e8 e5 f6 ff ff	call	0x8048180
8048a9b:	e9 de fd ff ff	jmp	0x804887e
8048aa0:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048aa6:	50	push	eax
8048aa7:	b8 64 00 00 00	mov	eax,0x64
8048aac:	5b	pop	ebx
8048aad:	93	xchg	ebx,eax
8048aae:	99	cdq	
8048aaf:	f7 fb	idiv	ebx
8048ab1:	89 87 14 00 00 00	mov	DWORD PTR [edi+0x14],eax
8048ab7:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048abd:	50	push	eax
8048abe:	8b 87 14 00 00 00	mov	eax,DWORD PTR [edi+0x14]
8048ac4:	50	push	eax
8048ac5:	b8 64 00 00 00	mov	eax,0x64
8048aca:	5b	pop	ebx
8048acb:	f7 eb	imul	ebx
8048acd:	5b	pop	ebx
8048ace:	93	xchg	ebx,eax
8048acf:	29 d8	sub	eax,ebx
8048ad1:	89 87 18 00 00 00	mov	DWORD PTR [edi+0x18],eax
8048ad7:	b9 eb 8a 04 08	mov	ecx,0x8048aeb
8048adc:	ba 0c 00 00 00	mov	edx,0xc
8048ae1:	e8 8a f6 ff ff	call	0x8048170
8048ae6:	e9 0d 00 00 00	jmp	0x8048af8
8048aeb:	53	push	ebx
8048aec:	75 20	jne	0x8048b0e
8048aee:	76 75	jbe	0x8048b65

8048af0:	65	gs
8048af1:	6c	ins BYTE PTR es:[edi],dx
8048af2:	74 6f	je 0x8048b63
8048af4:	3a 20	cmp ah,BYTE PTR [eax]
8048af6:	24 00	and al,0x0
8048af8:	8b 87 14 00 00 00	mov eax,DWORD PTR [edi+0x14]
8048afe:	e8 8d f6 ff ff	call 0x8048190
8048b03:	b9 17 8b 04 08	mov ecx,0x8048b17
8048b08:	ba 01 00 00 00	mov edx,0x1
8048b0d:	e8 5e f6 ff ff	call 0x8048170
8048b12:	e9 02 00 00 00	jmp 0x8048b19
8048b17:	2e 00 8b 87 18 00 00	add BYTE PTR cs:[ebx+0x1887],cl
8048b1e:	00 50 b8	add BYTE PTR [eax-0x48],dl
8048b21:	0a 00	or al,BYTE PTR [eax]
8048b23:	00 00	add BYTE PTR [eax],al
8048b25:	5b	pop ebx
8048b26:	39 c3	cmp ebx,eax
8048b28:	7c 05	j1 0x8048b2f
8048b2a:	e9 16 00 00 00	jmp 0x8048b45
8048b2f:	b9 43 8b 04 08	mov ecx,0x8048b43
8048b34:	ba 01 00 00 00	mov edx,0x1
8048b39:	e8 32 f6 ff ff	call 0x8048170
8048b3e:	e9 02 00 00 00	jmp 0x8048b45
8048b43:	30 00	xor BYTE PTR [eax],al
8048b45:	8b 87 18 00 00 00	mov eax,DWORD PTR [edi+0x18]
8048b4b:	e8 40 f6 ff ff	call 0x8048190
8048b50:	e8 2b f6 ff ff	call 0x8048180
8048b55:	e8 26 f6 ff ff	call 0x8048180
8048b5a:	8b 87 08 00 00 00	mov eax,DWORD PTR [edi+0x8]
8048b60:	50	push eax
8048b61:	b8 88 13 00 00	mov eax,0x1388
8048b66:	5b	pop ebx
8048b67:	39 c3	cmp ebx,eax
8048b69:	7d 05	jge 0x8048b70
8048b6b:	e9 40 00 00 00	jmp 0x8048bb0
8048b70:	b9 84 8b 04 08	mov ecx,0x8048b84
8048b75:	ba 10 00 00 00	mov edx,0x10
8048b7a:	e8 f1 f5 ff ff	call 0x8048170
8048b7f:	e9 11 00 00 00	jmp 0x8048b95
8048b84:	31 20	xor DWORD PTR [eax],esp
8048b86:	62 69 6c	bound ebp,QWORD PTR [ecx+0x6c]
8048b89:	6c	ins BYTE PTR es:[edi],dx
8048b8a:	65	gs
8048b8b:	74 65	je 0x8048bf2
8048b8d:	20 64 65 20	and BYTE PTR [ebp+eiz*2+0x20],ah
8048b91:	24 35	and al,0x35

8048b93:	30 00	xor	BYTE PTR [eax],al
8048b95:	e8 e6 f5 ff ff	call	0x8048180
8048b9a:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048ba0:	50	push	eax
8048ba1:	b8 88 13 00 00	mov	eax,0x1388
8048ba6:	5b	pop	ebx
8048ba7:	93	xchg	ebx, eax
8048ba8:	29 d8	sub	eax, ebx
8048baa:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8], eax
8048bb0:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048bb6:	50	push	eax
8048bb7:	b8 d0 07 00 00	mov	eax,0x7d0
8048bbc:	5b	pop	ebx
8048bbd:	39 c3	cmp	ebx, eax
8048bbf:	7d 05	jge	0x8048bc6
8048bc1:	e9 c2 00 00 00	jmp	0x8048c88
8048bc6:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048bcc:	50	push	eax
8048bcd:	b8 d0 07 00 00	mov	eax,0x7d0
8048bd2:	5b	pop	ebx
8048bd3:	93	xchg	ebx, eax
8048bd4:	99	cdq	
8048bd5:	f7 fb	idiv	ebx
8048bd7:	50	push	eax
8048bd8:	b8 01 00 00 00	mov	eax,0x1
8048bdd:	5b	pop	ebx
8048bde:	39 c3	cmp	ebx, eax
8048be0:	74 05	je	0x8048be7
8048be2:	e9 2a 00 00 00	jmp	0x8048c11
8048be7:	b9 fb 8b 04 08	mov	ecx,0x8048bfb
8048bec:	ba 10 00 00 00	mov	edx,0x10
8048bf1:	e8 7a f5 ff ff	call	0x8048170
8048bf6:	e9 11 00 00 00	jmp	0x8048c0c
8048bfb:	31 20	xor	DWORD PTR [eax], esp
8048bfd:	62 69 6c	bound	ebp, QWORD PTR [ecx+0x6c]
8048c00:	6c	ins	BYTE PTR es:[edi], dx
8048c01:	65	gs	
8048c02:	74 65	je	0x8048c69
8048c04:	20 64 65 20	and	BYTE PTR [ebp+eiz*2+0x20], ah
8048c08:	24 32	and	al, 0x32
8048c0a:	30 00	xor	BYTE PTR [eax], al
8048c0c:	e8 6f f5 ff ff	call	0x8048180
8048c11:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048c17:	50	push	eax
8048c18:	b8 d0 07 00 00	mov	eax,0x7d0
8048c1d:	5b	pop	ebx

8048c1e:	93	xchg	ebx,eax
8048c1f:	99	cdq	
8048c20:	f7 fb	idiv	ebx
8048c22:	50	push	eax
8048c23:	b8 01 00 00 00	mov	eax,0x1
8048c28:	5b	pop	ebx
8048c29:	39 c3	cmp	ebx,eax
8048c2b:	75 05	jne	0x8048c32
8048c2d:	e9 2b 00 00 00	jmp	0x8048c5d
8048c32:	b9 46 8c 04 08	mov	ecx,0x8048c46
8048c37:	ba 11 00 00 00	mov	edx,0x11
8048c3c:	e8 2f f5 ff ff	call	0x8048170
8048c41:	e9 12 00 00 00	jmp	0x8048c58
8048c46:	32 20	xor	ah,BYTE PTR [eax]
8048c48:	62 69 6c	bound	ebp,QWORD PTR [ecx+0x6c]
8048c4b:	6c	ins	BYTE PTR es:[edi],dx
8048c4c:	65	gs	
8048c4d:	74 65	je	0x8048cb4
8048c4f:	73 20	jae	0x8048c71
8048c51:	64 65 20 24 32	fs and	BYTE PTR fs:gs:[edx+esi*1],ah
8048c56:	30 00	xor	BYTE PTR [eax],al
8048c58:	e8 23 f5 ff ff	call	0x8048180
8048c5d:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048c63:	50	push	eax
8048c64:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048c6a:	50	push	eax
8048c6b:	b8 d0 07 00 00	mov	eax,0x7d0
8048c70:	5b	pop	ebx
8048c71:	93	xchg	ebx,eax
8048c72:	99	cdq	
8048c73:	f7 fb	idiv	ebx
8048c75:	50	push	eax
8048c76:	b8 d0 07 00 00	mov	eax,0x7d0
8048c7b:	5b	pop	ebx
8048c7c:	f7 eb	imul	ebx
8048c7e:	5b	pop	ebx
8048c7f:	93	xchg	ebx,eax
8048c80:	29 d8	sub	eax,ebx
8048c82:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048c88:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048c8e:	50	push	eax
8048c8f:	b8 e8 03 00 00	mov	eax,0x3e8
8048c94:	5b	pop	ebx
8048c95:	39 c3	cmp	ebx,eax
8048c97:	7d 05	jge	0x8048c9e
8048c99:	e9 40 00 00 00	jmp	0x8048cde

8048c9e:	b9 b2 8c 04 08	mov	ecx,0x8048cb2
8048ca3:	ba 10 00 00 00	mov	edx,0x10
8048ca8:	e8 c3 f4 ff ff	call	0x8048170
8048cad:	e9 11 00 00 00	jmp	0x8048cc3
8048cb2:	31 20	xor	DWORD PTR [eax],esp
8048cb4:	62 69 6c	bound	ebp,QWORD PTR [ecx+0x6c]
8048cb7:	6c	ins	BYTE PTR es:[edi],dx
8048cb8:	65	gs	
8048cb9:	74 65	je	0x8048d20
8048cbb:	20 64 65 20	and	BYTE PTR [ebp+eiz*2+0x20],ah
8048cbf:	24 31	and	al,0x31
8048cc1:	30 00	xor	BYTE PTR [eax],al
8048cc3:	e8 b8 f4 ff ff	call	0x8048180
8048cc8:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048cce:	50	push	eax
8048ccf:	b8 e8 03 00 00	mov	eax,0x3e8
8048cd4:	5b	pop	ebx
8048cd5:	93	xchg	ebx,eax
8048cd6:	29 d8	sub	eax,ebx
8048cd8:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048cde:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048ce4:	50	push	eax
8048ce5:	b8 f4 01 00 00	mov	eax,0x1f4
8048cea:	5b	pop	ebx
8048ceb:	39 c3	cmp	ebx,eax
8048ced:	7d 05	jge	0x8048cf4
8048cef:	e9 3f 00 00 00	jmp	0x8048d33
8048cf4:	b9 08 8d 04 08	mov	ecx,0x8048d08
8048cf9:	ba 0f 00 00 00	mov	edx,0xf
8048cfe:	e8 6d f4 ff ff	call	0x8048170
8048d03:	e9 10 00 00 00	jmp	0x8048d18
8048d08:	31 20	xor	DWORD PTR [eax],esp
8048d0a:	62 69 6c	bound	ebp,QWORD PTR [ecx+0x6c]
8048d0d:	6c	ins	BYTE PTR es:[edi],dx
8048d0e:	65	gs	
8048d0f:	74 65	je	0x8048d76
8048d11:	20 64 65 20	and	BYTE PTR [ebp+eiz*2+0x20],ah
8048d15:	24 35	and	al,0x35
8048d17:	00 e8	add	al,ch
8048d19:	63 f4	arpl	sp,si
8048d1b:	ff	(bad)	
8048d1c:	ff 8b 87 08 00 00	dec	DWORD PTR [ebx+0x887]
8048d22:	00 50 b8	add	BYTE PTR [eax-0x48],dl
8048d25:	f4	hlt	
8048d26:	01 00	add	DWORD PTR [eax],eax
8048d28:	00 5b 93	add	BYTE PTR [ebx-0x6d],bl

8048d2b:	29 d8	sub	eax,ebx
8048d2d:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048d33:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048d39:	50	push	eax
8048d3a:	b8 c8 00 00 00	mov	eax,0xc8
8048d3f:	5b	pop	ebx
8048d40:	39 c3	cmp	ebx,eax
8048d42:	7d 05	jge	0x8048d49
8048d44:	e9 c0 00 00 00	jmp	0x8048e09
8048d49:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048d4f:	50	push	eax
8048d50:	b8 c8 00 00 00	mov	eax,0xc8
8048d55:	5b	pop	ebx
8048d56:	93	xchg	ebx,eax
8048d57:	99	cdq	
8048d58:	f7 fb	idiv	ebx
8048d5a:	50	push	eax
8048d5b:	b8 01 00 00 00	mov	eax,0x1
8048d60:	5b	pop	ebx
8048d61:	39 c3	cmp	ebx,eax
8048d63:	74 05	je	0x8048d6a
8048d65:	e9 29 00 00 00	jmp	0x8048d93
8048d6a:	b9 7e 8d 04 08	mov	ecx,0x8048d7e
8048d6f:	ba 0f 00 00 00	mov	edx,0xf
8048d74:	e8 f7 f3 ff ff	call	0x8048170
8048d79:	e9 10 00 00 00	jmp	0x8048d8e
8048d7e:	31 20	xor	DWORD PTR [eax],esp
8048d80:	62 69 6c	bound	ebp,QWORD PTR [ecx+0x6c]
8048d83:	6c	ins	BYTE PTR es:[edi],dx
8048d84:	65	gs	
8048d85:	74 65	je	0x8048dec
8048d87:	20 64 65 20	and	BYTE PTR [ebp+eiz*2+0x20],ah
8048d8b:	24 32	and	al,0x32
8048d8d:	00 e8	add	al,ch
8048d8f:	ed	in	eax,dx
8048d90:	f3 ff	repz	(bad)
8048d92:	ff 8b 87 08 00 00	dec	DWORD PTR [ebx+0x887]
8048d98:	00 50 b8	add	BYTE PTR [eax-0x48],dl
8048d9b:	c8 00 00 00	enter	0x0,0x0
8048d9f:	5b	pop	ebx
8048da0:	93	xchg	ebx,eax
8048da1:	99	cdq	
8048da2:	f7 fb	idiv	ebx
8048da4:	50	push	eax
8048da5:	b8 01 00 00 00	mov	eax,0x1
8048daa:	5b	pop	ebx

8048dab:	39 c3	cmp	ebx,eax
8048dad:	75 05	jne	0x8048db4
8048daf:	e9 2a 00 00 00	jmp	0x8048dde
8048db4:	b9 c8 8d 04 08	mov	ecx,0x8048dc8
8048db9:	ba 10 00 00 00	mov	edx,0x10
8048dbe:	e8 ad f3 ff ff	call	0x8048170
8048dc3:	e9 11 00 00 00	jmp	0x8048dd9
8048dc8:	32 20	xor	ah,BYTE PTR [eax]
8048dca:	62 69 6c	bound	ebp,QWORD PTR [ecx+0x6c]
8048dcd:	6c	ins	BYTE PTR es:[edi],dx
8048dce:	65	gs	
8048dcf:	74 65	je	0x8048e36
8048dd1:	73 20	jae	0x8048df3
8048dd3:	64 65 20 24 32	fs and	BYTE PTR fs:gs:[edx+esi*1],ah
8048dd8:	00 e8	add	al,ch
8048dda:	a2 f3 ff ff 8b	mov	ds:0xbfffffff3,al
8048ddf:	87 08	xchg	DWORD PTR [eax],ecx
8048de1:	00 00	add	BYTE PTR [eax],al
8048de3:	00 50 8b	add	BYTE PTR [eax-0x75],dl
8048de6:	87 08	xchg	DWORD PTR [eax],ecx
8048de8:	00 00	add	BYTE PTR [eax],al
8048dea:	00 50 b8	add	BYTE PTR [eax-0x48],dl
8048ded:	c8 00 00 00	enter	0x0,0x0
8048df1:	5b	pop	ebx
8048df2:	93	xchg	ebx,eax
8048df3:	99	cdq	
8048df4:	f7 fb	idiv	ebx
8048df6:	50	push	eax
8048df7:	b8 c8 00 00 00	mov	eax,0xc8
8048dfc:	5b	pop	ebx
8048dfd:	f7 eb	imul	ebx
8048dff:	5b	pop	ebx
8048e00:	93	xchg	ebx,eax
8048e01:	29 d8	sub	eax,ebx
8048e03:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048e09:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048e0f:	50	push	eax
8048e10:	b8 64 00 00 00	mov	eax,0x64
8048e15:	5b	pop	ebx
8048e16:	39 c3	cmp	ebx,eax
8048e18:	7d 05	jge	0x8048e1f
8048e1a:	e9 3e 00 00 00	jmp	0x8048e5d
8048e1f:	b9 33 8e 04 08	mov	ecx,0x8048e33
8048e24:	ba 0e 00 00 00	mov	edx,0xe
8048e29:	e8 42 f3 ff ff	call	0x8048170
8048e2e:	e9 0f 00 00 00	jmp	0x8048e42

8048e33:	31 20	xor	DWORD PTR [eax],esp
8048e35:	6d	ins	DWORD PTR es:[edi],dx
8048e36:	6f	outs	dx,DWORD PTR ds:[esi]
8048e37:	6e	outs	dx,BYTE PTR ds:[esi]
8048e38:	65	gs	
8048e39:	64	fs	
8048e3a:	61	popa	
8048e3b:	20 64 65 20	and	BYTE PTR [ebp+eiz*2+0x20],ah
8048e3f:	24 31	and	al,0x31
8048e41:	00 e8	add	al,ch
8048e43:	39 f3	cmp	ebx,esi
8048e45:	ff	(bad)	
8048e46:	ff 8b 87 08 00 00	dec	DWORD PTR [ebx+0x887]
8048e4c:	00 50 b8	add	BYTE PTR [eax-0x48],dl
8048e4f:	64 00 00	add	BYTE PTR fs:[eax],al
8048e52:	00 5b 93	add	BYTE PTR [ebx-0x6d],bl
8048e55:	29 d8	sub	eax,ebx
8048e57:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048e5d:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048e63:	50	push	eax
8048e64:	b8 32 00 00 00	mov	eax,0x32
8048e69:	5b	pop	ebx
8048e6a:	39 c3	cmp	ebx,eax
8048e6c:	7d 05	jge	0x8048e73
8048e6e:	e9 47 00 00 00	jmp	0x8048eba
8048e73:	b9 87 8e 04 08	mov	ecx,0x8048e87
8048e78:	ba 17 00 00 00	mov	edx,0x17
8048e7d:	e8 ee f2 ff ff	call	0x8048170
8048e82:	e9 18 00 00 00	jmp	0x8048e9f
8048e87:	31 20	xor	DWORD PTR [eax],esp
8048e89:	6d	ins	DWORD PTR es:[edi],dx
8048e8a:	6f	outs	dx,DWORD PTR ds:[esi]
8048e8b:	6e	outs	dx,BYTE PTR ds:[esi]
8048e8c:	65	gs	
8048e8d:	64	fs	
8048e8e:	61	popa	
8048e8f:	20 64 65 20	and	BYTE PTR [ebp+eiz*2+0x20],ah
8048e93:	35 30 20 63 65	xor	eax,0x65632030
8048e98:	6e	outs	dx,BYTE PTR ds:[esi]
8048e99:	74 61	je	0x8048efc
8048e9b:	76 6f	jbe	0x8048f0c
8048e9d:	73 00	jae	0x8048e9f
8048e9f:	e8 dc f2 ff ff	call	0x8048180
8048ea4:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048eaa:	50	push	eax
8048eab:	b8 32 00 00 00	mov	eax,0x32

8048eb0:	5b	pop	ebx
8048eb1:	93	xchg	ebx,eax
8048eb2:	29 d8	sub	eax,ebx
8048eb4:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048eba:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048ec0:	50	push	eax
8048ec1:	b8 19 00 00 00	mov	eax,0x19
8048ec6:	5b	pop	ebx
8048ec7:	39 c3	cmp	ebx,eax
8048ec9:	7d 05	jge	0x8048ed0
8048ecb:	e9 47 00 00 00	jmp	0x8048f17
8048ed0:	b9 e4 8e 04 08	mov	ecx,0x8048ee4
8048ed5:	ba 17 00 00 00	mov	edx,0x17
8048eda:	e8 91 f2 ff ff	call	0x8048170
8048edf:	e9 18 00 00 00	jmp	0x8048efc
8048ee4:	31 20	xor	DWORD PTR [eax],esp
8048ee6:	6d	ins	DWORD PTR es:[edi],dx
8048ee7:	6f	outs	dx,DWORD PTR ds:[esi]
8048ee8:	6e	outs	dx,BYTE PTR ds:[esi]
8048ee9:	65	gs	
8048eea:	64	fs	
8048eeb:	61	popa	
8048eec:	20 64 65 20	and	BYTE PTR [ebp+eiz*2+0x20],ah
8048ef0:	32 35 20 63 65 6e	xor	dh,BYTE PTR ds:0x6e656320
8048ef6:	74 61	je	0x8048f59
8048ef8:	76 6f	jbe	0x8048f69
8048efa:	73 00	jae	0x8048efc
8048efc:	e8 7f f2 ff ff	call	0x8048180
8048f01:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048f07:	50	push	eax
8048f08:	b8 19 00 00 00	mov	eax,0x19
8048f0d:	5b	pop	ebx
8048f0e:	93	xchg	ebx,eax
8048f0f:	29 d8	sub	eax,ebx
8048f11:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8],eax
8048f17:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048f1d:	50	push	eax
8048f1e:	b8 0a 00 00 00	mov	eax,0xa
8048f23:	5b	pop	ebx
8048f24:	39 c3	cmp	ebx,eax
8048f26:	7d 05	jge	0x8048f2d
8048f28:	e9 d0 00 00 00	jmp	0x8048ffd
8048f2d:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048f33:	50	push	eax
8048f34:	b8 0a 00 00 00	mov	eax,0xa
8048f39:	5b	pop	ebx

8048f3a:	93	xchg	ebx,eax
8048f3b:	99	cdq	
8048f3c:	f7 fb	idiv	ebx
8048f3e:	50	push	eax
8048f3f:	b8 01 00 00 00	mov	eax,0x1
8048f44:	5b	pop	ebx
8048f45:	39 c3	cmp	ebx,eax
8048f47:	74 05	je	0x8048f4e
8048f49:	e9 31 00 00 00	jmp	0x8048f7f
8048f4e:	b9 62 8f 04 08	mov	ecx,0x8048f62
8048f53:	ba 17 00 00 00	mov	edx,0x17
8048f58:	e8 13 f2 ff ff	call	0x8048170
8048f5d:	e9 18 00 00 00	jmp	0x8048f7a
8048f62:	31 20	xor	DWORD PTR [eax],esp
8048f64:	6d	ins	DWORD PTR es:[edi],dx
8048f65:	6f	outs	dx,DWORD PTR ds:[esi]
8048f66:	6e	outs	dx,BYTE PTR ds:[esi]
8048f67:	65	gs	
8048f68:	64	fs	
8048f69:	61	popa	
8048f6a:	20 64 65 20	and	BYTE PTR [ebp+eiz*2+0x20],ah
8048f6e:	31 30	xor	DWORD PTR [eax],esi
8048f70:	20 63 65	and	BYTE PTR [ebx+0x65],ah
8048f73:	6e	outs	dx,BYTE PTR ds:[esi]
8048f74:	74 61	je	0x8048fd7
8048f76:	76 6f	jbe	0x8048fe7
8048f78:	73 00	jae	0x8048f7a
8048f7a:	e8 01 f2 ff ff	call	0x8048180
8048f7f:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048f85:	50	push	eax
8048f86:	b8 0a 00 00 00	mov	eax,0xa
8048f8b:	5b	pop	ebx
8048f8c:	93	xchg	ebx,eax
8048f8d:	99	cdq	
8048f8e:	f7 fb	idiv	ebx
8048f90:	50	push	eax
8048f91:	b8 01 00 00 00	mov	eax,0x1
8048f96:	5b	pop	ebx
8048f97:	39 c3	cmp	ebx,eax
8048f99:	75 05	jne	0x8048fa0
8048f9b:	e9 32 00 00 00	jmp	0x8048fd2
8048fa0:	b9 b4 8f 04 08	mov	ecx,0x8048fb4
8048fa5:	ba 18 00 00 00	mov	edx,0x18
8048faa:	e8 c1 f1 ff ff	call	0x8048170
8048faf:	e9 19 00 00 00	jmp	0x8048fcd
8048fb4:	32 20	xor	ah,BYTE PTR [eax]

8048fb6:	6d	ins	DWORD PTR es:[edi],dx
8048fb7:	6f	outs	dx,DWORD PTR ds:[esi]
8048fb8:	6e	outs	dx,BYTE PTR ds:[esi]
8048fb9:	65	gs	
8048fba:	64	fs	
8048fbb:	61	popa	
8048fbc:	73 20	jae	0x8048fde
8048fbe:	64 65 20 31	fs and	BYTE PTR fs:gs:[ecx],dh
8048fc2:	30 20	xor	BYTE PTR [eax],ah
8048fc4:	63 65 6e	arpl	WORD PTR [ebp+0x6e],sp
8048fc7:	74 61	je	0x804902a
8048fc9:	76 6f	jbe	0x804903a
8048fcb:	73 00	jae	0x8048fcd
8048fcd:	e8 ae f1 ff ff	call	0x8048180
8048fd2:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048fd8:	50	push	eax
8048fd9:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8048fdf:	50	push	eax
8048fe0:	b8 0a 00 00 00	mov	eax,0xa
8048fe5:	5b	pop	ebx
8048fe6:	93	xchg	ebx, eax
8048fe7:	99	cdq	
8048fe8:	f7 fb	idiv	ebx
8048fea:	50	push	eax
8048feb:	b8 0a 00 00 00	mov	eax,0xa
8048ff0:	5b	pop	ebx
8048ff1:	f7 eb	imul	ebx
8048ff3:	5b	pop	ebx
8048ff4:	93	xchg	ebx, eax
8048ff5:	29 d8	sub	eax, ebx
8048ff7:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8], eax
8048ffd:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
8049003:	50	push	eax
8049004:	b8 05 00 00 00	mov	eax,0x5
8049009:	5b	pop	ebx
804900a:	39 c3	cmp	ebx, eax
804900c:	7d 05	jge	0x8049013
804900e:	e9 46 00 00 00	jmp	0x8049059
8049013:	b9 27 90 04 08	mov	ecx,0x8049027
8049018:	ba 16 00 00 00	mov	edx,0x16
804901d:	e8 4e f1 ff ff	call	0x8048170
8049022:	e9 17 00 00 00	jmp	0x804903e
8049027:	31 20	xor	DWORD PTR [eax], esp
8049029:	6d	ins	DWORD PTR es:[edi], dx
804902a:	6f	outs	dx,DWORD PTR ds:[esi]
804902b:	6e	outs	dx,BYTE PTR ds:[esi]

804902c:	65	gs
804902d:	64	fs
804902e:	61	popa
804902f:	20 64 65 20	and BYTE PTR [ebp+eiz*2+0x20],ah
8049033:	35 20 63 65 6e	xor eax,0x6e656320
8049038:	74 61	je 0x804909b
804903a:	76 6f	jbe 0x80490ab
804903c:	73 00	jae 0x804903e
804903e:	e8 3d f1 ff ff	call 0x8048180
8049043:	8b 87 08 00 00 00	mov eax,DWORD PTR [edi+0x8]
8049049:	50	push eax
804904a:	b8 05 00 00 00	mov eax,0x5
804904f:	5b	pop ebx
8049050:	93	xchg ebx,eax
8049051:	29 d8	sub eax,ebx
8049053:	89 87 08 00 00 00	mov DWORD PTR [edi+0x8],eax
8049059:	8b 87 08 00 00 00	mov eax,DWORD PTR [edi+0x8]
804905f:	50	push eax
8049060:	b8 01 00 00 00	mov eax,0x1
8049065:	5b	pop ebx
8049066:	39 c3	cmp ebx,eax
8049068:	7f 05	jg 0x804906f
804906a:	e9 3a 00 00 00	jmp 0x80490a9
804906f:	8b 87 08 00 00 00	mov eax,DWORD PTR [edi+0x8]
8049075:	e8 16 f1 ff ff	call 0x8048190
804907a:	b9 8e 90 04 08	mov ecx,0x804908e
804907f:	ba 15 00 00 00	mov edx,0x15
8049084:	e8 e7 f0 ff ff	call 0x8048170
8049089:	e9 16 00 00 00	jmp 0x80490a4
804908e:	20 6d 6f	and BYTE PTR [ebp+0x6f],ch
8049091:	6e	outs dx,BYTE PTR ds:[esi]
8049092:	65	gs
8049093:	64	fs
8049094:	61	popa
8049095:	73 20	jae 0x80490b7
8049097:	64 65 20 31	fs and BYTE PTR fs:gs:[ecx],dh
804909b:	20 63 65	and BYTE PTR [ebx+0x65],ah
804909e:	6e	outs dx,BYTE PTR ds:[esi]
804909f:	74 61	je 0x8049102
80490a1:	76 6f	jbe 0x8049112
80490a3:	00 e8	add al,ch
80490a5:	d7	xlat BYTE PTR ds:[ebx]
80490a6:	f0 ff	lock (bad)
80490a8:	ff 8b 87 08 00 00	dec DWORD PTR [ebx+0x887]
80490ae:	00 50 b8	add BYTE PTR [eax-0x48],dl
80490b1:	01 00	add DWORD PTR [eax],eax

80490b3:	00 00	add	BYTE PTR [eax],al
80490b5:	5b	pop	ebx
80490b6:	39 c3	cmp	ebx,eax
80490b8:	74 05	je	0x80490bf
80490ba:	e9 2f 00 00 00	jmp	0x80490ee
80490bf:	b9 d3 90 04 08	mov	ecx,0x80490d3
80490c4:	ba 15 00 00 00	mov	edx,0x15
80490c9:	e8 a2 f0 ff ff	call	0x8048170
80490ce:	e9 16 00 00 00	jmp	0x80490e9
80490d3:	31 20	xor	DWORD PTR [eax],esp
80490d5:	6d	ins	DWORD PTR es:[edi],dx
80490d6:	6f	outs	dx,DWORD PTR ds:[esi]
80490d7:	6e	outs	dx,BYTE PTR ds:[esi]
80490d8:	65	gs	
80490d9:	64	fs	
80490da:	61	popa	
80490db:	20 64 65 20	and	BYTE PTR [ebp+eiz*2+0x20],ah
80490df:	31 20	xor	DWORD PTR [eax],esp
80490e1:	63 65 6e	arpl	WORD PTR [ebp+0x6e],sp
80490e4:	74 61	je	0x8049147
80490e6:	76 6f	jbe	0x8049157
80490e8:	00 e8	add	al,ch
80490ea:	92	xchg	edx,eax
80490eb:	f0 ff	lock (bad)	
80490ed:	ff	(bad)	
80490ee:	e9 0d f2 ff ff	jmp	0x8048300
...			

3.8. BIEN-07

3.8.1. Código Fuente

```

CONST N = 20;

VAR A, B, C;

PROCEDURE TRIANGULO;
VAR A, B;
BEGIN
    WRITELN;
    #A := 15;
    write('ingrese base triangulo: '); readln(A);
    WHILE A > 0 DO
        BEGIN
            B := 0;
            WHILE B < A DO
                BEGIN

```



```

        WRITE (','*');
        B := B + 1
    END;
    WRITELN;
    A := A - 1;
END
END;

BEGIN
    A := 1;
    WHILE A <= N DO
        BEGIN
            WRITE (A, ','*');
            A := A + 1
        END;

        CALL TRIANGULO;

        B := -N;
        C := 0;
        WHILE B < C DO
            BEGIN
                WRITE (B, ','*');
                B := B + 1
            END;
            WRITELN;

        END.

```

3.8.2. Contenido Hexadecimal Completo

```

0000000 457f 464c 0101 0001 0000 0000 0000 0000
0000010 0002 0003 0001 0000 8480 0804 0034 0000
0000020 0065 0000 0000 0000 0000 0034 0020 0001 0028
0000030 0003 0001 0001 0000 0000 0000 0000 8000 0804
0000040 8000 0804 0639 0000 0639 0000 0007 0000
0000050 1000 0000 2e00 6873 7473 7472 6261 2e00
0000060 6574 7478 0000 0000 0000 0000 0000 0000
0000070 0000 0000 0000 0000 0000 0000 0000 0000
0000080 0000 0000 0000 0000 0000 0000 0100 0000
0000090 0300 0000 0000 0000 0000 0000 0000 5400 0000
00000a0 1100 0000 0000 0000 0000 0000 0100 0000
00000b0 0000 0000 0b00 0000 0100 0000 0600 0000
00000c0 e000 0480 e008 0000 5900 0005 0000 0000
00000d0 0000 0000 0100 0000 0000 0000 0000 0000
00000e0 5152 5053 04b8 0000 bb00 0001 0000 e189
00000f0 01ba 0000 cd00 5880 595b c35a 8955 81e5

```

0000100	24ec	0000	5200	5351	36b8	0000	bb00	0000
0000110	0000	01b9	0054	8d00	dc55	80cd	6581	f5e8
0000120	ffff	b8ff	0036	0000	00bb	0000	b900	5402
0000130	0000	558d	cddc	3180	50c0	03b8	0000	bb00
0000140	0000	0000	e189	01ba	0000	cd00	8180	e84d
0000150	000a	0000	36b8	0000	bb00	0000	0000	02b9
0000160	0054	8d00	dc55	80cd	5b58	5a59	ec89	c35d
0000170	04b8	0000	bb00	0001	0000	80cd	90c3	9090
0000180	0ab0	59e8	ffff	c3ff	3004	51e8	ffff	c3ff
0000190	003d	0000	7580	b04e	e82d	ff42	ffff	02b0
00001a0	e3e8	ffff	b0ff	e801	ffdc	ffff	04b0	d5e8
00001b0	ffff	b0ff	e807	ffce	ffff	04b0	c7e8	ffff
00001c0	b0ff	e808	ffc0	ffff	03b0	b9e8	ffff	b0ff
00001d0	e806	ffb2	ffff	04b0	abe8	ffff	b0ff	e808
00001e0	ffa4	ffff	3dc3	0000	0000	0b7d	b050	e82d
00001f0	feec	ffff	f758	3dd8	000a	0000	8c0f	00ef
0000200	0000	643d	0000	0f00	d18c	0000	3d00	03e8
0000210	0000	8c0f	00b3	0000	103d	0027	0f00	958c
0000220	0000	3d00	86a0	0001	7b7c	403d	0f42	7c00
0000230	3d61	9680	0098	477c	003d	f5e1	7c05	3d2d
0000240	ca00	3b9a	137c	00ba	0000	bb00	ca00	3b9a
0000250	fbf7	e852	ff30	ffff	ba58	0000	0000	00bb
0000260	f5e1	f705	52fb	1de8	ffff	58ff	00ba	0000
0000270	bb00	9680	0098	fbf7	e852	ff0a	ffff	ba58
0000280	0000	0000	40bb	0f42	f700	52fb	f7e8	fffe
0000290	58ff	00ba	0000	bb00	86a0	0001	fbf7	e852
00002a0	fee4	ffff	ba58	0000	0000	10bb	0027	f700
00002b0	52fb	d1e8	fffe	58ff	00ba	0000	bb00	03e8
00002c0	0000	fbf7	e852	febe	ffff	ba58	0000	0000
00002d0	64bb	0000	f700	52fb	abe8	fffe	58ff	00ba
00002e0	0000	bb00	000a	0000	fbf7	e852	fe98	ffff
00002f0	e858	fe92	ffff	90c3	9090	9090	9090	9090
0000300	01b8	0000	bb00	0000	0000	80cd	9090	9090
0000310	00b9	0000	b300	5103	e853	fdde	ffff	595b
0000320	0a3c	840f	0134	0000	7f3c	840f	0094	0000
0000330	2d3c	840f	0109	0000	303c	db7c	393c	d77f
0000340	302c	fb80	7400	80d0	02fb	0c75	f981	0000
0000350	0000	0475	003c	bf74	fb80	7503	3c0a	7500
0000360	b304	eb00	b302	8101	ccf9	cccc	7f0c	81a8
0000370	34f9	3333	7cf3	88a0	b8c7	000a	0000	e9f7
0000380	083d	0000	7480	3d11	fff8	7fff	1375	ff80
0000390	7e07	e90e	ff7f	ffff	ff80	0f08	768f	ffff
00003a0	b9ff	0000	0000	f988	fb80	7402	0104	ebc1
00003b0	2903	91c8	f888	5351	cbe8	fffd	5bff	e959
00003c0	ff53	ffff	fb80	0f03	4a84	ffff	51ff	b053
00003d0	e808	fd0a	ffff	20b0	03e8	fffd	b0ff	e808

```

00003e0 fcf8 ffff 595b fb80 7500 b307 e903 ff25
00003f0 ffff fb80 7502 810f 00f9 0000 7500 b307
0000400 e903 ff11 ffff c889 0ab9 0000 ba00 0000
0000410 0000 003d 0000 7d00 f708 f7d8 f7f9 ebd8
0000420 f702 89f9 81c1 00f9 0000 0f00 e685 fffe
0000430 80ff 02fb 840f fedd ffff 03b3 d6e9 fffe
0000440 80ff 03fb 850f fecd ffff 2db0 5351 8de8
0000450 fffc 5bff b359 e902 febb ffff fb80 0f03
0000460 b284 fffe 80ff 02fb 0c75 f981 0000 0000
0000470 840f fea1 ffff e851 fd04 ffff 8959 c3c8
0000480 25bf 0486 e908 00c6 0000 f1e8 fffc b9ff
0000490 84a3 0804 18ba 0000 e800 fcd2 ffff 19e9
00004a0 0000 6900 676e 6572 6573 6220 7361 2065
00004b0 7274 6169 676e 6c75 3a6f 0020 4fe8 fffe
00004c0 89ff 0c87 0000 8b00 0c87 0000 5000 00b8
00004d0 0000 5b00 c339 057f 72e9 0000 b800 0000
00004e0 0000 8789 0010 0000 878b 0010 0000 8b50
00004f0 0c87 0000 5b00 c339 057c 30e9 0000 b900
0000500 8513 0804 01ba 0000 e800 fc62 ffff 02e9
0000510 0000 2a00 8b00 1087 0000 5000 01b8 0000
0000520 5b00 d801 8789 0010 0000 b9e9 ffff e8ff
0000530 fc4c ffff 878b 000c 0000 b850 0001 0000
0000540 935b d829 8789 000c 0000 78e9 ffff c3ff
0000550 01b8 0000 8900 0087 0000 8b00 0087 0000
0000560 5000 14b8 0000 5b00 c339 057e 3be9 0000
0000570 8b00 0087 0000 e800 fc14 ffff 90b9 0485
0000580 ba08 0001 0000 e5e8 fffb e9ff 0002 0000
0000590 0020 878b 0000 0000 b850 0001 0000 015b
00005a0 89d8 0087 0000 e900 ffa8 ffff d9e8 fffe
00005b0 b8ff 0014 0000 d8f7 8789 0004 0000 00b8
00005c0 0000 8900 0887 0000 8b00 0487 0000 5000
00005d0 878b 0008 0000 395b 7cc3 e905 003b 0000
00005e0 878b 0004 0000 a5e8 fffb b9ff 85ff 0804
00005f0 01ba 0000 e800 fb76 ffff 02e9 0000 2000
0000600 8b00 0487 0000 5000 01b8 0000 5b00 d801
0000610 8789 0004 0000 aee9 ffff e8ff fb60 ffff
0000620 dbe9 fffc 00ff 0000 0000 0000 0000 0000
0000630 0000 0000 0000 0000 0000
0000639

```

3.8.3. Listado Desensamblado de la sección *.text*

text/BIEN-07: formato del fichero elf32-i386

Desensamblado de la sección *.text*:

080480e0 <.text>:

...

8048480:	bf 25 86 04 08	mov	edi,0x8048625
8048485:	e9 c6 00 00 00	jmp	0x8048550
804848a:	e8 f1 fc ff ff	call	0x8048180
804848f:	b9 a3 84 04 08	mov	ecx,0x80484a3
8048494:	ba 18 00 00 00	mov	edx,0x18
8048499:	e8 d2 fc ff ff	call	0x8048170
804849e:	e9 19 00 00 00	jmp	0x80484bc
80484a3:	69 6e 67 72 65 73 65	imul	ebp,DWORD PTR [esi+0x67],0x65736572
80484aa:	20 62 61	and	BYTE PTR [edx+0x61],ah
80484ad:	73 65	jae	0x8048514
80484af:	20 74 72 69	and	BYTE PTR [edx+esi*2+0x69],dh
80484b3:	61	popa	
80484b4:	6e	outs	dx,BYTE PTR ds:[esi]
80484b5:	67 75 6c	addr16	jne 0x8048524
80484b8:	6f	outs	dx,DWORD PTR ds:[esi]
80484b9:	3a 20	cmp	ah,BYTE PTR [eax]
80484bb:	00 e8	add	al,ch
80484bd:	4f	dec	edi
80484be:	fe	(bad)	
80484bf:	ff	(bad)	
80484c0:	ff 89 87 0c 00 00	dec	DWORD PTR [ecx+0xc87]
80484c6:	00 8b 87 0c 00 00	add	BYTE PTR [ebx+0xc87],cl
80484cc:	00 50 b8	add	BYTE PTR [eax-0x48],dl
80484cf:	00 00	add	BYTE PTR [eax],al
80484d1:	00 00	add	BYTE PTR [eax],al
80484d3:	5b	pop	ebx
80484d4:	39 c3	cmp	ebx,eax
80484d6:	7f 05	jg	0x80484dd
80484d8:	e9 72 00 00 00	jmp	0x804854f
80484dd:	b8 00 00 00 00	mov	eax,0x0
80484e2:	89 87 10 00 00 00	mov	DWORD PTR [edi+0x10],eax
80484e8:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
80484ee:	50	push	eax
80484ef:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
80484f5:	5b	pop	ebx
80484f6:	39 c3	cmp	ebx,eax
80484f8:	7c 05	jl	0x80484ff
80484fa:	e9 30 00 00 00	jmp	0x804852f
80484ff:	b9 13 85 04 08	mov	ecx,0x8048513
8048504:	ba 01 00 00 00	mov	edx,0x1
8048509:	e8 62 fc ff ff	call	0x8048170
804850e:	e9 02 00 00 00	jmp	0x8048515
8048513:	2a 00	sub	al,BYTE PTR [eax]

8048515:	8b 87 10 00 00 00	mov	eax,DWORD PTR [edi+0x10]
804851b:	50	push	eax
804851c:	b8 01 00 00 00	mov	eax,0x1
8048521:	5b	pop	ebx
8048522:	01 d8	add	eax,ebx
8048524:	89 87 10 00 00 00	mov	DWORD PTR [edi+0x10],eax
804852a:	e9 b9 ff ff ff	jmp	0x80484e8
804852f:	e8 4c fc ff ff	call	0x8048180
8048534:	8b 87 0c 00 00 00	mov	eax,DWORD PTR [edi+0xc]
804853a:	50	push	eax
804853b:	b8 01 00 00 00	mov	eax,0x1
8048540:	5b	pop	ebx
8048541:	93	xchg	ebx, eax
8048542:	29 d8	sub	eax, ebx
8048544:	89 87 0c 00 00 00	mov	DWORD PTR [edi+0xc], eax
804854a:	e9 78 ff ff ff	jmp	0x80484c7
804854f:	c3	ret	
8048550:	b8 01 00 00 00	mov	eax,0x1
8048555:	89 87 00 00 00 00	mov	DWORD PTR [edi+0x0], eax
804855b:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
8048561:	50	push	eax
8048562:	b8 14 00 00 00	mov	eax,0x14
8048567:	5b	pop	ebx
8048568:	39 c3	cmp	ebx, eax
804856a:	7e 05	jle	0x8048571
804856c:	e9 3b 00 00 00	jmp	0x80485ac
8048571:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
8048577:	e8 14 fc ff ff	call	0x8048190
804857c:	b9 90 85 04 08	mov	ecx,0x8048590
8048581:	ba 01 00 00 00	mov	edx,0x1
8048586:	e8 e5 fb ff ff	call	0x8048170
804858b:	e9 02 00 00 00	jmp	0x8048592
8048590:	20 00	and	BYTE PTR [eax], al
8048592:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
8048598:	50	push	eax
8048599:	b8 01 00 00 00	mov	eax,0x1
804859e:	5b	pop	ebx
804859f:	01 d8	add	eax, ebx
80485a1:	89 87 00 00 00 00	mov	DWORD PTR [edi+0x0], eax
80485a7:	e9 af ff ff ff	jmp	0x804855b
80485ac:	e8 d9 fe ff ff	call	0x804848a
80485b1:	b8 14 00 00 00	mov	eax,0x14
80485b6:	f7 d8	neg	eax
80485b8:	89 87 04 00 00 00	mov	DWORD PTR [edi+0x4], eax
80485be:	b8 00 00 00 00	mov	eax,0x0
80485c3:	89 87 08 00 00 00	mov	DWORD PTR [edi+0x8], eax

80485c9:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
80485cf:	50	push	eax
80485d0:	8b 87 08 00 00 00	mov	eax,DWORD PTR [edi+0x8]
80485d6:	5b	pop	ebx
80485d7:	39 c3	cmp	ebx, eax
80485d9:	7c 05	j1	0x80485e0
80485db:	e9 3b 00 00 00	jmp	0x804861b
80485e0:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
80485e6:	e8 a5 fb ff ff	call	0x8048190
80485eb:	b9 ff 85 04 08	mov	ecx,0x80485ff
80485f0:	ba 01 00 00 00	mov	edx,0x1
80485f5:	e8 76 fb ff ff	call	0x8048170
80485fa:	e9 02 00 00 00	jmp	0x8048601
80485ff:	20 00	and	BYTE PTR [eax],al
8048601:	8b 87 04 00 00 00	mov	eax,DWORD PTR [edi+0x4]
8048607:	50	push	eax
8048608:	b8 01 00 00 00	mov	eax,0x1
804860d:	5b	pop	ebx
804860e:	01 d8	add	eax,ebx
8048610:	89 87 04 00 00 00	mov	DWORD PTR [edi+0x4],eax
8048616:	e9 ae ff ff ff	jmp	0x80485c9
804861b:	e8 60 fb ff ff	call	0x8048180
8048620:	e9 db fc ff ff	jmp	0x8048300
...			

3.9. BIEN-08

3.9.1. Código Fuente

```

var K;
procedure P;
  procedure coma;
  begin
    write (','');
    K := K + 1;
    call P
  end;
begin
  if K < 10 then
  begin
    write (K);
    call coma;
  end
end;

begin
  K := 1;

```

```

call P;
writeln (10)
end.

```

3.9.2. Contenido Hexadecimal Completo

```

0000000 457f 464c 0101 0001 0000 0000 0000 0000
0000010 0002 0003 0001 0000 8480 0804 0034 0000
0000020 0065 0000 0000 0000 0034 0020 0001 0028
0000030 0003 0001 0001 0000 0000 0000 8000 0804
0000040 8000 0804 050f 0000 050f 0000 0007 0000
0000050 1000 0000 2e00 6873 7473 7472 6261 2e00
0000060 6574 7478 0000 0000 0000 0000 0000 0000
0000070 0000 0000 0000 0000 0000 0000 0000 0000
0000080 0000 0000 0000 0000 0000 0000 0100 0000
0000090 0300 0000 0000 0000 0000 0000 5400 0000
00000a0 1100 0000 0000 0000 0000 0000 0100 0000
00000b0 0000 0000 0b00 0000 0100 0000 0600 0000
00000c0 e000 0480 e008 0000 2f00 0004 0000 0000
00000d0 0000 0000 0100 0000 0000 0000 0000 0000
00000e0 5152 5053 04b8 0000 bb00 0001 0000 e189
00000f0 01ba 0000 cd00 5880 595b c35a 8955 81e5
0000100 24ec 0000 5200 5351 36b8 0000 bb00 0000
0000110 0000 01b9 0054 8d00 dc55 80cd 6581 f5e8
0000120 ffff b8ff 0036 0000 00bb 0000 b900 5402
0000130 0000 558d cddc 3180 50c0 03b8 0000 bb00
0000140 0000 0000 e189 01ba 0000 cd00 8180 e84d
0000150 000a 0000 36b8 0000 bb00 0000 0000 02b9
0000160 0054 8d00 dc55 80cd 5b58 5a59 ec89 c35d
0000170 04b8 0000 bb00 0001 0000 80cd 90c3 9090
0000180 0ab0 59e8 ffff c3ff 3004 51e8 ffff c3ff
0000190 003d 0000 7580 b04e e82d ff42 ffff 02b0
00001a0 e3e8 ffff b0ff e801 ffdc ffff 04b0 d5e8
00001b0 ffff b0ff e807 ffce ffff 04b0 c7e8 ffff
00001c0 b0ff e808 ffc0 ffff 03b0 b9e8 ffff b0ff
00001d0 e806 ffb2 ffff 04b0 abe8 ffff b0ff e808
00001e0 ffa4 ffff 3dc3 0000 0000 0b7d b050 e82d
00001f0 feec ffff f758 3dd8 000a 0000 8c0f 00ef
0000200 0000 643d 0000 0f00 d18c 0000 3d00 03e8
0000210 0000 8c0f 00b3 0000 103d 0027 0f00 958c
0000220 0000 3d00 86a0 0001 7b7c 403d 0f42 7c00
0000230 3d61 9680 0098 477c 003d f5e1 7c05 3d2d
0000240 ca00 3b9a 137c 00ba 0000 bb00 ca00 3b9a
0000250 fbf7 e852 ff30 ffff ba58 0000 0000 00bb
0000260 f5e1 f705 52fb 1de8 ffff 58ff 00ba 0000
0000270 bb00 9680 0098 fbf7 e852 ff0a ffff ba58

```

```

0000280 0000 0000 40bb 0f42 f700 52fb f7e8 fffe
0000290 58ff 00ba 0000 bb00 86a0 0001 fbf7 e852
00002a0 fee4 ffff ba58 0000 0000 10bb 0027 f700
00002b0 52fb d1e8 fffe 58ff 00ba 0000 bb00 03e8
00002c0 0000 fbf7 e852 febe ffff ba58 0000 0000
00002d0 64bb 0000 f700 52fb abe8 fffe 58ff 00ba
00002e0 0000 bb00 000a 0000 fbf7 e852 fe98 ffff
00002f0 e858 fe92 ffff 90c3 9090 9090 9090 9090
0000300 01b8 0000 bb00 0000 0000 80cd 9090 9090
0000310 00b9 0000 b300 5103 e853 fdde ffff 595b
0000320 0a3c 840f 0134 0000 7f3c 840f 0094 0000
0000330 2d3c 840f 0109 0000 303c db7c 393c d77f
0000340 302c fb80 7400 80d0 02fb 0c75 f981 0000
0000350 0000 0475 003c bf74 fb80 7503 3c0a 7500
0000360 b304 eb00 b302 8101 ccf9 cccc 7f0c 81a8
0000370 34f9 3333 7cf3 88a0 b8c7 000a 0000 e9f7
0000380 083d 0000 7480 3d11 fff8 7fff 1375 ff80
0000390 7e07 e90e ff7f ffff ff80 0f08 768f ffff
00003a0 b9ff 0000 0000 f988 fb80 7402 0104 ebc1
00003b0 2903 91c8 f888 5351 cbe8 fffd 5bff e959
00003c0 ff53 ffff fb80 0f03 4a84 ffff 51ff b053
00003d0 e808 fd0a ffff 20b0 03e8 fffd b0ff e808
00003e0 fcfc ffff 595b fb80 7500 b307 e903 ff25
00003f0 ffff fb80 7502 810f 00f9 0000 7500 b307
0000400 e903 ff11 ffff c889 0ab9 0000 ba00 0000
0000410 0000 003d 0000 7d00 f708 f7d8 f7f9 ebd8
0000420 f702 89f9 81c1 00f9 0000 0f00 e685 fffe
0000430 80ff 02fb 840f fedd ffff 03b3 d6e9 fffe
0000440 80ff 03fb 850f fecd ffff 2db0 5351 8de8
0000450 fffc 5bff b359 e902 febb ffff fb80 0f03
0000460 b284 fffe 80ff 02fb 0c75 f981 0000 0000
0000470 840f fea1 ffff e851 fd04 ffff 8959 c3c8
0000480 0bbf 0485 e908 005d 0000 31e9 0000 b900
0000490 84a3 0804 01ba 0000 e800 fcd2 ffff 02e9
00004a0 0000 2c00 8b00 0087 0000 5000 01b8 0000
00004b0 5b00 d801 8789 0000 0000 cbe8 ffff c3ff
00004c0 878b 0000 0000 b850 000a 0000 395b 7cc3
00004d0 e905 0010 0000 878b 0000 0000 afe8 fffc
00004e0 e8ff ffa9 ffff b8c3 0001 0000 8789 0000
00004f0 0000 93e8 ffff b8ff 000a 0000 8fe8 fffc
0000500 e8ff fc7a ffff f5e9 fffd 00ff 0000 0000
000050f

```

3.9.3. Listado Desensamblado de la sección *.text*

text/BIEN-08: formato del fichero elf32-i386

Desensamblado de la sección .text:

080480e0 <.text>:

...

8048480:	bf 0b 85 04 08	mov	edi,0x804850b
8048485:	e9 5d 00 00 00	jmp	0x80484e7
804848a:	e9 31 00 00 00	jmp	0x80484c0
804848f:	b9 a3 84 04 08	mov	ecx,0x80484a3
8048494:	ba 01 00 00 00	mov	edx,0x1
8048499:	e8 d2 fc ff ff	call	0x8048170
804849e:	e9 02 00 00 00	jmp	0x80484a5
80484a3:	2c 00	sub	al,0x0
80484a5:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
80484ab:	50	push	eax
80484ac:	b8 01 00 00 00	mov	eax,0x1
80484b1:	5b	pop	ebx
80484b2:	01 d8	add	eax,ebx
80484b4:	89 87 00 00 00 00	mov	DWORD PTR [edi+0x0],eax
80484ba:	e8 cb ff ff ff	call	0x804848a
80484bf:	c3	ret	
80484c0:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
80484c6:	50	push	eax
80484c7:	b8 0a 00 00 00	mov	eax,0xa
80484cc:	5b	pop	ebx
80484cd:	39 c3	cmp	ebx,eax
80484cf:	7c 05	j1	0x80484d6
80484d1:	e9 10 00 00 00	jmp	0x80484e6
80484d6:	8b 87 00 00 00 00	mov	eax,DWORD PTR [edi+0x0]
80484dc:	e8 af fc ff ff	call	0x8048190
80484e1:	e8 a9 ff ff ff	call	0x804848f
80484e6:	c3	ret	
80484e7:	b8 01 00 00 00	mov	eax,0x1
80484ec:	89 87 00 00 00 00	mov	DWORD PTR [edi+0x0],eax
80484f2:	e8 93 ff ff ff	call	0x804848a
80484f7:	b8 0a 00 00 00	mov	eax,0xa
80484fc:	e8 8f fc ff ff	call	0x8048190
8048501:	e8 7a fc ff ff	call	0x8048180
8048506:	e9 f5 fd ff ff	jmp	0x8048300
804850b:	00 00	add	BYTE PTR [eax],al

...

3.10. BIEN-09

3.10.1. Código Fuente

3.10.2. Contenido Hexadecimal Completo

0000000	457f	464c	0101	0001	0000	0000	0000	0000
0000010	0002	0003	0001	0000	8480	0804	0034	0000
0000020	0065	0000	0000	0000	0034	0020	0001	0028
0000030	0003	0001	0001	0000	0000	0000	8000	0804
0000040	8000	0804	048a	0000	048a	0000	0007	0000
0000050	1000	0000	2e00	6873	7473	7472	6261	2e00
0000060	6574	7478	0000	0000	0000	0000	0000	0000
0000070	0000	0000	0000	0000	0000	0000	0000	0000
0000080	0000	0000	0000	0000	0000	0000	0100	0000
0000090	0300	0000	0000	0000	0000	0000	5400	0000
00000a0	1100	0000	0000	0000	0000	0000	0100	0000
00000b0	0000	0000	0b00	0000	0100	0000	0600	0000
00000c0	e000	0480	e008	0000	aa00	0003	0000	0000
00000d0	0000	0000	0100	0000	0000	0000	0000	0000
00000e0	5152	5053	04b8	0000	bb00	0001	0000	e189
00000f0	01ba	0000	cd00	5880	595b	c35a	8955	81e5
0000100	24ec	0000	5200	5351	36b8	0000	bb00	0000
0000110	0000	01b9	0054	8d00	dc55	80cd	6581	f5e8
0000120	ffff	b8ff	0036	0000	00bb	0000	b900	5402
0000130	0000	558d	cddc	3180	50c0	03b8	0000	bb00
0000140	0000	0000	e189	01ba	0000	cd00	8180	e84d
0000150	000a	0000	36b8	0000	bb00	0000	0000	02b9
0000160	0054	8d00	dc55	80cd	5b58	5a59	ec89	c35d
0000170	04b8	0000	bb00	0001	0000	80cd	90c3	9090
0000180	0ab0	59e8	ffff	c3ff	3004	51e8	ffff	c3ff
0000190	003d	0000	7580	b04e	e82d	ff42	ffff	02b0
00001a0	e3e8	ffff	b0ff	e801	ffdc	ffff	04b0	d5e8
00001b0	ffff	b0ff	e807	ffce	ffff	04b0	c7e8	ffff
00001c0	b0ff	e808	ffc0	ffff	03b0	b9e8	ffff	b0ff
00001d0	e806	ffb2	ffff	04b0	abe8	ffff	b0ff	e808
00001e0	ffa4	ffff	3dc3	0000	0000	0b7d	b050	e82d
00001f0	feec	ffff	f758	3dd8	000a	0000	8c0f	00ef
0000200	0000	643d	0000	0f00	d18c	0000	3d00	03e8
0000210	0000	8c0f	00b3	0000	103d	0027	0f00	958c
0000220	0000	3d00	86a0	0001	7b7c	403d	0f42	7c00
0000230	3d61	9680	0098	477c	003d	f5e1	7c05	3d2d
0000240	ca00	3b9a	137c	00ba	0000	bb00	ca00	3b9a
0000250	fbf7	e852	ff30	ffff	ba58	0000	0000	00bb
0000260	f5e1	f705	52fb	1de8	ffff	58ff	00ba	0000
0000270	bb00	9680	0098	fbf7	e852	ff0a	ffff	ba58
0000280	0000	0000	40bb	0f42	f700	52fb	f7e8	fffe

```

0000290 58ff 00ba 0000 bb00 86a0 0001 fbf7 e852
00002a0 fee4 ffff ba58 0000 0000 10bb 0027 f700
00002b0 52fb d1e8 fffe 58ff 00ba 0000 bb00 03e8
00002c0 0000 fbf7 e852 febe ffff ba58 0000 0000
00002d0 64bb 0000 f700 52fb abe8 fffe 58ff 00ba
00002e0 0000 bb00 000a 0000 fbf7 e852 fe98 ffff
00002f0 e858 fe92 ffff 90c3 9090 9090 9090 9090
0000300 01b8 0000 bb00 0000 0000 80cd 9090 9090
0000310 00b9 0000 b300 5103 e853 fdde ffff 595b
0000320 0a3c 840f 0134 0000 7f3c 840f 0094 0000
0000330 2d3c 840f 0109 0000 303c db7c 393c d77f
0000340 302c fb80 7400 80d0 02fb 0c75 f981 0000
0000350 0000 0475 003c bf74 fb80 7503 3c0a 7500
0000360 b304 eb00 b302 8101 ccf9 cccc 7f0c 81a8
0000370 34f9 3333 7cf3 88a0 b8c7 000a 0000 e9f7
0000380 083d 0000 7480 3d11 fff8 7fff 1375 ff80
0000390 7e07 e90e ff7f ffff ff80 0f08 768f ffff
00003a0 b9ff 0000 0000 f988 fb80 7402 0104 ebc1
00003b0 2903 91c8 f888 5351 cbe8 fffd 5bff e959
00003c0 ff53 ffff fb80 0f03 4a84 ffff 51ff b053
00003d0 e808 fd0a ffff 20b0 03e8 fffd b0ff e808
00003e0 fcfc ffff 595b fb80 7500 b307 e903 ff25
00003f0 ffff fb80 7502 810f 00f9 0000 7500 b307
0000400 e903 ff11 ffff c889 0ab9 0000 ba00 0000
0000410 0000 003d 0000 7d00 f708 f7d8 f7f9 ebd8
0000420 f702 89f9 81c1 00f9 0000 0f00 e685 fffe
0000430 80ff 02fb 840f fedd ffff 03b3 d6e9 fffe
0000440 80ff 03fb 850f fecd ffff 2db0 5351 8de8
0000450 fffc 5bff b359 e902 febb ffff fb80 0f03
0000460 b284 fffe 80ff 02fb 0c75 f981 0000 0000
0000470 840f fea1 ffff e851 fd04 ffff 8959 c3c8
0000480 8abf 0484 e908 fe76 ffff
000048a

```

3.10.3. Listado Desensamblado de la sección *.text*

text/BIEN-09: formato del fichero elf32-i386

Desensamblado de la sección *.text*:

080480e0 <.text>:

...

```

8048480:      bf 8a 84 04 08      mov     edi,0x804848a
8048485:      e9 76 fe ff ff      jmp     0x8048300

```

4. Programas Incorrectos

4.1. MAL-00

4.1.1. Código Fuente

```
var X, Y;

procedure INICIAR;
  const Y = 2;
  procedure ASIGNAR;
    X = Y;
  call ASIGNAR;

begin
  write ('NUM=') readln (Y);
  call INICIAR;
  writeln ("NUM*2=",Y*X)
end.
```

4.1.2. Errores de Compilacion

Mensajes de Error	Corrección
6. X = Y;	X := Y;
7. Error Sintactico: Esperada asignacion luego de variable	
11. write ('NUM=') readln (Y);	write ('NUM=');
12. Error Sintactico: Se esperaba un END o punto y coma (;) luego de una proposicion de un Begin	readln (Y);
14. writeln ("NUM*2=",Y*X)	writeln ('NUM*2=',Y*X)
15. Error Lexico: comillas de cadena incorrecta	

Cuadro 1: Errores MAL-00. Primera compilacion.

4.2. MAL-01

4.2.1. Código Fuente

```
VAR BASE, EXPO, RESU;

PROCEDURE POT;
IF EXPO > 0 THEN
  BEGIN
    RESU = RESU * BASE;
    EXPO := EXPO - 1;
    CALL POT
  END;
```

```

BEGIN
    WRITE ( 'BASE: ' ); READLN(BASE);
    WRITE ( 'EXPONENTE: ' ); READLN(EXPO)
    RESU := 1;
    CALL POT;
    IF EXPO < 0 RESU := 0;
    WRITELN ( 'RESULTADO: ', RESU );
    WRITELN
END.

```

4.2.2. Errores de Compilacion

Mensajes de Error	Corrección
6.RESU = RESU * BASE; 7.Error Sintactico: Esperada asignacion luego de variable	RESU := RESU * BASE;
14.READLN(EXPO) 15.RESU := 1; 16.Error Sintactico: Se esperaba un END o punto y coma (;) luego de una proposicion de un Begin	READLN(EXPO);
IF EXPO > 0 RESU := 0; Error Sintactico: Se esperaba un 'then' luego de la condicion de un 'if'	IF EXPO > 0 THEN RESU := 0;

Cuadro 2: Errores MAL-01. Primera compilacion.

4.3. MAL-02

4.3.1. Código Fuente

```

var X, Y, Z;

procedure MULTIPLICAR;
var A, B, A;
begin
    A := X;
    B := Y;
    Z := 0;
    if X < 0 then A := -A;
    if Y < 0 then B := -B;
    while B > 0 then
        begin
            if odd B then Z:= Z + A;
            A := A * 2;
            B := B / 2
        end;

```

```

    if X < 0 then Z:= -Z;
    if Y < 0 then Z:= -Z
end;

Begin
    write ('X: '); readLn X;
    write ('Y: '); readLn (Y);
    MULTIPLICAR;
    writeLn ('X*Y=', Z);
end.

```

4.3.2. Errores de Compilacion

Mensajes de Error	Corrección
4. var A, B, A; 5. Error Semantico: Identificador ya declarado 10. if Y (0 then B := -B; 11. Error Sintactico: Se esperaba simbolo de comparacion en comparacion 12. Error Sintactico: Cierre de parentesis faltante	var A, B; if Y < 0 then B := -B;
13. while B ¿0 then 14. Error Sintactico: Se esperaba un 'do' luego de la condicion de un 'while'	while B > 0 do
25. readLn X; 26. Error Sintactico: Se esperaba un parentesis luego de readln 27. Error Sintactico: Se esperaba cierre de parentesis luego de readln	readLn(X);
29. MULTIPLICAR; 30. Error Semantico: Solo pueden utilizarse variables del lado izquierdo de una asignacion 31. Error Sintactico: Esperada asignacion luego de variable writeLn ('X*Y=', Z); Error Sintactico: Simbolo no esperado: writeLn Error Sintactico: Se esperaba un END o punto y coma (;) luego de una proposicion de un Begin	call MULTIPLICAR;

Cuadro 3: Errores MAL-02. Primera compilacion.

Referencias

- [1] <https://www.python.org/>
- [2] **BNF**: Backus-Naur Form. https://en.wikipedia.org/wiki/Backus%E2%80%93Naur_Form