

МИНОБРНАУКИ РОССИИ
САНКТ-ПЕТЕРБУРГСКИЙ ГОСУДАРСТВЕННЫЙ
ЭЛЕКТРОТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ
«ЛЭТИ» ИМ. В.И. УЛЬЯНОВА (ЛЕНИНА)
Кафедра МОЭВМ

ОТЧЕТ
по лабораторной работе №4
по дисциплине «Программирование на ассемблере»
Тема: Представление констант

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Преподаватель

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Санкт-Петербург

2020

Цель работы.

Исследовать машинное представление данных.

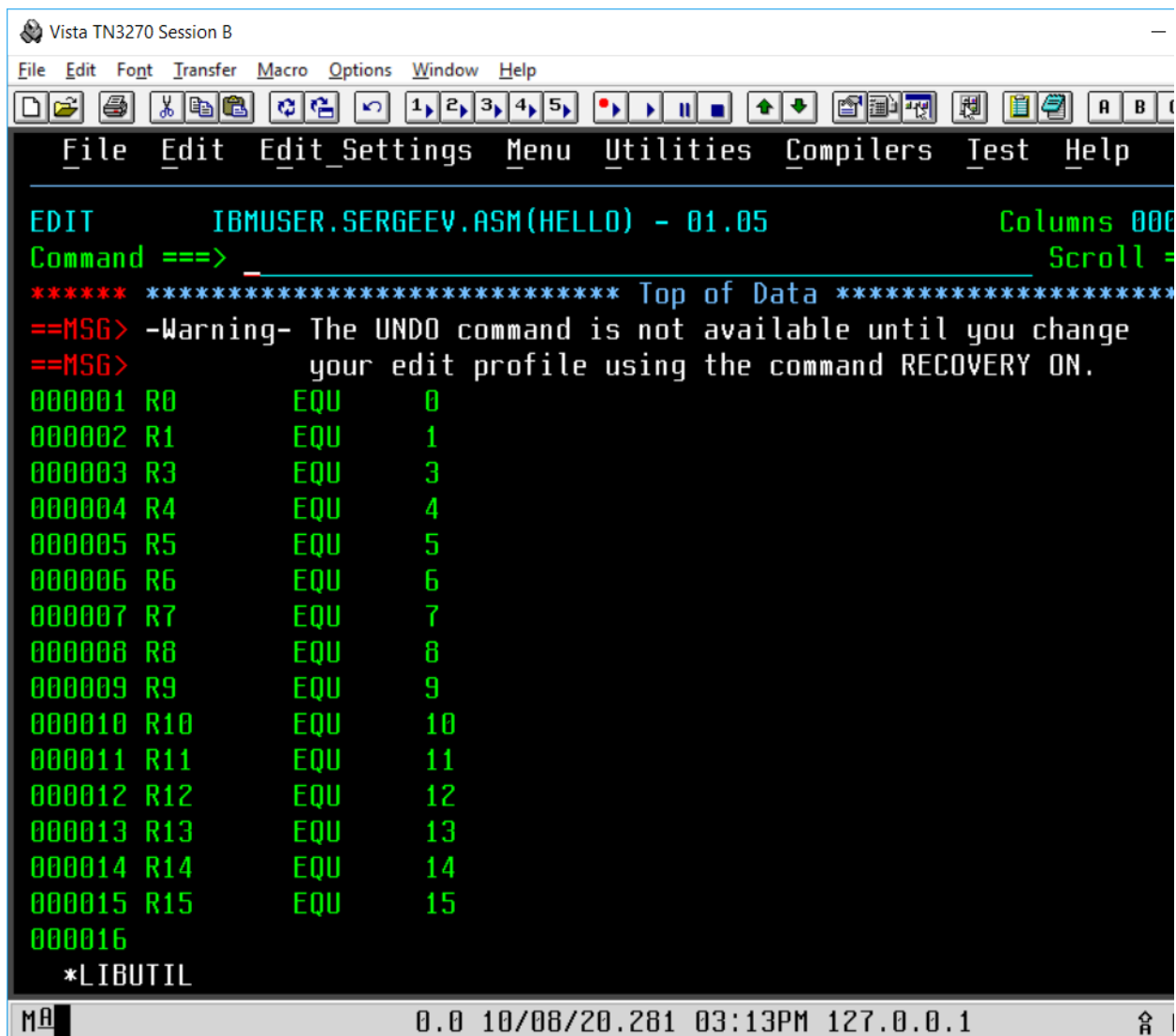
Для достижения поставленной цели требуется решить следующие задачи:

1. Написать различные типы констант.
2. Скомпилировать исходный модуль.
3. Проанализировать листинг и определить представления различных

типов констант в памяти компьютера.

Ход работы.

В программу из предыдущей лабораторной работы были вписаны различные варианты определения констант и памяти.



The screenshot shows a terminal window titled "Vista TN3270 Session B". The menu bar includes File, Edit, Font, Transfer, Macro, Options, Window, and Help. The toolbar contains various icons for file operations and editing. The main window has a menu bar with File, Edit, Edit_Settings, Menu, Utilities, Compilers, Test, and Help. The terminal content is as follows:

```
EDIT      IBMUSER.SERGEEV.ASM(HELLO) - 01.05      Columns 000
Command ==>                                         Scroll =
***** Top of Data *****
==MSG> -Warning- The UNDO command is not available until you change
==MSG> your edit profile using the command RECOVERY ON.
000001 R0      EQU      0
000002 R1      EQU      1
000003 R3      EQU      3
000004 R4      EQU      4
000005 R5      EQU      5
000006 R6      EQU      6
000007 R7      EQU      7
000008 R8      EQU      8
000009 R9      EQU      9
000010 R10     EQU      10
000011 R11     EQU      11
000012 R12     EQU      12
000013 R13     EQU      13
000014 R14     EQU      14
000015 R15     EQU      15
000016
*LIBUTIL
```

The status bar at the bottom shows "MA" on the left, "0.0 10/08/20.281 03:13PM 127.0.0.1" in the center, and a small icon on the right.

Vista TN3270 Session B

File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

```
EDIT          IBMUSER.SERGEEV.ASM(HELLO) - 01.05          Columns 000
Command ==>          Scroll =
000017 HELLO CSECT
000018          AMODE 31
000019          RMODE 24
000020          STM   R14,R12,12(R13)
000021          LR   R12,R15
000022          USING HELLO,R12
000023          ST    R13,SAVE+4
000024          LA    R11,SAVE
000025          ST    R11,8(13)
000026          WTO  'HELLO WORLD!'
000027          L     R13,SAVE+4
000028          LM    R14,R12,12(R13)
000029          LA    R15,0
000030          BR    R14
000031
000032 BPAD          DC      BL1'101'
000033 BTRUNC      DC      BL1'100100011'
000034 D          DC      B'10100000'
000035 F          DC      B'11110101111'
*LIBUTIL
```

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Vista TN3270 Session B

File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

```
EDIT          IBMUSER.SERGEEV.ASM(HELLO) - 01.05          Columns 000
Command ==>          Scroll =
000036 CX1      DC      CL5'ABC'
000037 CX2      DC      2CL3'ABCDEF'
000038 CY        DS      CL2000
000039 CZ        DS      0CL5
000040          DS      CL3
000041 CA        DS      CL2
000042 XX        DC      X'ABC0'
000043 XALPH     DC      3XL2'A6F4E'
000044 XALP      DC      3X'A6F4E'
000045 XY        DS      3X
000046 XZ        DS      XL5
000047 FPX       DC      F'100'
000048 FPX0      DC      F'-30'
000049 FPX1      DC      H'5'
000050 FPY       DS      0F
000051 FPZ       DS      0H
000052 FPC       DS      0D
000053 FPA       DS      F
000054 FPB       DS      H
*LIBUTIL
```

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Vista TN3270 Session B

File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT IBMUSER.SERGEV.ASM(HELLO) - 01.05 Columns 000 Scroll =

Command ==>

```
000055 AX      DC      A(FPX)
000056 AA      DC      A(FPX+10)
000057 AY      DC      V(EXTADR)
000058 PKA     DC      P'12345'
000059 PKB     DC      PL2'12345'
000060 PKC     DC      PL4'123.45'
000061 PKD     DC      P'-345'
000062 PKE     DC      P'0'
000063 PKF     DC      P'-1'
000064 ZDA     DC      Z'12345'
000065 ZDB     DC      ZL2'-12345'
000066 ZDC     DC      Z'-12345'
000067 ZDD     DC      ZL4'-345'
000068 ZDE     DC      Z'0'
000069 ZDF     DC      Z'-1'
000070 ZDGC    DC      C'12345'
000071 SAVE    DS      18F
000072          END HELLO
```

***** Bottom of Data *****

*LIBUTIL

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Рисунки 1 - 4 – Модифицированная программа

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File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT IBMUSER.SERGEV.JOBLIB(JOB1) - 01.00 Member JOB1 saved Scroll ==> CSR

Command ==>

```
***** Top of Data *****
==MSG> -Warning- The UNDO command is not available until you change
==MSG> your edit profile using the command RECOVERY ON.
000100 //JOB1 JOB
000200 //STEP1 EXEC PROC=ASMACL
000300 //C.SYSIN DD DSN=IBMUSER.SERGEV.ASM(HELLO),DISP=SHR
000400 //C.SYSPRINT DD DSN=IBMUSER.SERGEV.LISTLIB(HELLO),
000500 //          DISP=(MOD,KEEP),UNIT=SYSALLDA
000600 //L.SYSIN DD DUMMY
000700 //L.SYSMOD DD DSN=IBMUSER.SERGEV.LOADLIB(HELLO),
000800 //          DISP=(MOD,KEEP),UNIT=SYSALLDA
000900 //STEP2 EXEC PGM=HELLO
001000 //STEPLIB DD DSN=IBMUSER.SERGEV.LOADLIB,DISP=SHR
***** Bottom of Data *****
```

*LIBUTIL

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Рисунок 5 – Задание

```

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File Edit Font Transfer Macro Options Window Help
File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT          IBMUSER.SERGEEV.JOBLIB(JOB1) - 01.00          Member JOB1 saved
Command ==> _          Scroll ==> CSR
***** ***** Top of Data *****
==MSG> -Warning- The UNDO command is not available until you change
==MSG>          your edit profile using the command RECOVERY ON.
000100 //JOB1 JOB
000200 //STEP1 EXEC PROC=ASMACL
000300 //C.SYSIN DD DSN=IBMUSER.SERGEEV.ASM(HELLO),DISP=SHR
000400 //C.SYSPRINT DD DSN=IBMUSER.SERGEEV.LISTLIB(HELLO),
000500 //          DISP=(MOD,KEEP),UNIT=SYSALLDA
000600 //L.SYSIN DD DUMMY
000700 //L.SYSLMOD DD DSN=IBMUSER.SERGEEV.LOADLIB(HELLO),
000800 //          DISP=(MOD,KEEP),UNIT=SYSALLDA
000900 //STEP2 EXEC PGM=HELLO
001000 //STEPLIB DD DSN=IBMUSER.SERGEEV.LOADLIB,DISP=SHR
***** ***** Bottom of Data *****

IKJ56250I JOB JOB1(JOB001382) SUBMITTED
*** _

MA 1.1 10/08/20.281 03:24PM 127.0.0.1 21.6

```

Рисунок 6 – Выполнение программы

```

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File Edit Font Transfer Macro Options Window Help
File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT          IBMUSER.SERGEEV.LISTLIB(HELLO) - 01.00          Columns 00001 00072
Command ==> _          Scroll ==> CSR
***** ***** Top of Data *****
==MSG> -CAUTION- Data contains invalid (non-display) characters. Use command
==MSG>          ==> FIND P'.' to position cursor to these
==MSG> -Warning- The UNDO command is not available until you change
==MSG>          your edit profile using the command RECOVERY ON.
000001 »
000002          High Level Assembler Option Su
000003
000004          No Overriding ASMAOPT Parameters
000005          No Overriding Parameters
000006          No Process Statements
000007
000008
000009          Options for this Assembly
000010          NOADATA
000011          ALIGN
000012          NOASA
000013          BATCH
000014          CODEPAGE(047C)
*LIBUTIL

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```

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File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

```
EDIT          IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00          Columns 00001 00072
Command ==>          Scroll ==> CSR
000015      NOCOMPAT
000016      NOBCS
000017      NODECK
000018      DXREF
000019      ESD
000020      NOEXIT
000021      FLAG(0,ALIGN,CONT,EXLITW,NOIMPLEN,NOPAGE0,PUSH,RECORD,NOSUBSTR,USIN
000022      NOFOLD
000023      NOGOFF
000024      NOINFO
000025      LANGUAGE(EN)
000026      NOLIBMAC
000027      LINECOUNT(60)
000028      LIST(121)
000029      MACHINE(,NOLIST)
000030      MXREF(SOURCE)
000031      OBJECT
000032      OPTABLE(UNI,NOLIST)
000033      NOPCONTROL
*LIBUTIL
```

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File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

```
EDIT          IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00          Columns 00001 00072
Command ==>          Scroll ==> CSR
000034      NOPESTOP
000035      NOPROFILE
000036      NORA2
000037      NORENT
000038      RLD
000039      RXREF
000040      SECTALGN(8)
000041      SIZE(MAX)
000042      NOSUPWARN
000043      SYSPARM()
000044      NOTERM
000045      NOTEST
000046      THREAD
000047      NOTRANSLATE
000048      TYPECHECK(MAGNITUDE,REGISTER)
000049      USING(NOLIMIT,MAP,WARN(15))
000050      NOWORKFILE
000051      XREF(SHORT,UNREFS)
000052
*LIBUTIL
```

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File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00 Columns 00001 00072
Command ==> Scroll ==> CSR

000053 No Overriding DD Names

000054 »

000055 External Symbol Dictionary

Symbol	Type	Id	Address	Length	Owner	Id	Flags	Alias-of
	PC	00000001	00000000	00000000			02	
HELLO	SD	00000002	00000000	000000C8			00	
EXTADR	ER	00000003						

000060 »

000061

000062 Active Usings: None

Loc	Object	Code	Addr1	Addr2	Stmt	Source	Statement
			00000		1 R0	EQU	0
			00001		2 R1	EQU	1
			00003		3 R3	EQU	3
			00004		4 R4	EQU	4
			00005		5 R5	EQU	5
			00006		6 R6	EQU	6
			00007		7 R7	EQU	7
			00008		8 R8	EQU	8

000071

*LIBUTIL

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File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00 Columns 00001 00072
Command ==> Scroll ==> CSR

000072			00009		9 R9	EQU	9
000073			0000A		10 R10	EQU	10
000074			0000B		11 R11	EQU	11
000075			0000C		12 R12	EQU	12
000076			0000D		13 R13	EQU	13
000077			0000E		14 R14	EQU	14
000078			0000F		15 R15	EQU	15
000079	000000		00000	000C8	16 HELLO CSECT		
000080					17	AMODE	31
000081					18	RMODE	24
000082	000000	90EC D00C		0000C	19	STM	R14,R12,12(R13)
000083	000004	18CF			20	LR	R12,R15
000084			R:C	00000	21	USING	HELLO,R12
000085	000006	50D0 C884		00884	22	ST	R13,SAVE+4
000086	00000A	41B0 C880		00880	23	LA	R11,SAVE
000087	00000E	50BD 0008		00008	24	ST	R11,8(13)
000088					25	WTO	'HELLO WORLD!'
000089	000012	0700			27+	CNOP	0.4
000090	000014	A715 000A		00028	28+	BRAS	1,IHB0001A

000090

*LIBUTIL

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File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00 Columns 00001 00072
Command ===> Scroll ===> CSR

000091	000018	0010	29+	DC	AL2(16)
000092	00001A	0000	30+	DC	B'0000000000000000
000093	00001C	C8C5D3D3D640E6D6	31+	DC	C'HELLO WORLD!'
000094	000028		32+IH00001A	DS	0H
000095	000028	0A23	33+	SVC	35
000096	00002A	58D0 C884	34	L	R13.SAVE+4
000097	00002E	98EC D00C	35	LM	R14,R12,12(R13)
000098	000032	41F0 0000	36	LA	R15,0
000099	000036	07FE	37	BR	R14
000100	000038	05	39 BPAD	DC	BL1'101'
000101	000039	23	40 BTRUNC	DC	BL1'100100011'
000102	00003A	A0	41 D	DC	B'10100000'
000103	00003B	0F5F	42 F	DC	B'111101011111'
000104	00003D	C1C2C34040	43 CX1	DC	CL5'ABC'
000105	000042	C1C2C3C1C2C3	44 CX2	DC	2CL3'ABCDEF'
000106	000048		45 CY	DS	CL2000
000107	000018		46 CZ	DS	0CL5
000108	000018		47	DS	CL3
000109	000018		48 CA	DS	CL2

*LIBUTIL

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File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00 Columns 00001 00072
Command ===> Scroll ===> CSR

000091	000018	0010	29+	DC	AL2(16)
000092	00001A	0000	30+	DC	B'0000000000000000
000093	00001C	C8C5D3D3D640E6D6	31+	DC	C'HELLO WORLD!'
000094	000028		32+IH00001A	DS	0H
000095	000028	0A23	33+	SVC	35
000096	00002A	58D0 C884	34	L	R13.SAVE+4
000097	00002E	98EC D00C	35	LM	R14,R12,12(R13)
000098	000032	41F0 0000	36	LA	R15,0
000099	000036	07FE	37	BR	R14
000100	000038	05	39 BPAD	DC	BL1'101'
000101	000039	23	40 BTRUNC	DC	BL1'100100011'
000102	00003A	A0	41 D	DC	B'10100000'
000103	00003B	0F5F	42 F	DC	B'111101011111'
000104	00003D	C1C2C34040	43 CX1	DC	CL5'ABC'
000105	000042	C1C2C3C1C2C3	44 CX2	DC	2CL3'ABCDEF'
000106	000048		45 CY	DS	CL2000
000107	000018		46 CZ	DS	0CL5
000108	000018		47	DS	CL3
000109	000018		48 CA	DS	CL2

*LIBUTIL

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```
Vista TN3270 Session B
File Edit Font Transfer Macro Options Window Help
[Icons]
File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT          IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00          Columns 00001 00072
Command ==> Scroll ==> CSR
000129 000854 00000842          63 AA          DC          A(FPX+10)
000130 000858 00000000          64 AY          DC          V(EXTADR)
000131 00085C 12345C          65 PKA          DC          P'12345'
000132 00085F 345C          66 PKB          DC          PL2'12345'
000133 000861 0012345C          67 PKC          DC          PL4'123.45'
000134 000865 345D          68 PKD          DC          P'-345'
000135 000867 0C          69 PKE          DC          P'0'
000136 000868 1D          70 PKF          DC          P'-1'
000137 000869 F1F2F3F4C5          71 ZDA          DC          Z'12345'
000138 00086E F4D5          72 ZDB          DC          ZL2'-12345'
000139 000870 F1F2F3F4D5          73 ZDC          DC          Z'-12345'
000140 000875 F0F3F4D5          74 ZDD          DC          ZL4'-345'
000141 000879 C0          75 ZDE          DC          Z'0'
000142 00087A D1          76 ZDF          DC          Z'-1'
000143 00087B F1F2F3F4F5          77 ZDGC          DC          C'12345'
000144 000880          78 SAVE          DS          18F
000145 000000          79          END HELLO
000146 >>
000147 Relocation Dictionary
*LIBUTIL

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```

```
Vista TN3270 Session B
File Edit Font Transfer Macro Options Window Help
[Icons]
File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT          IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00          Columns 00001 00072
Command ==> Scroll ==> CSR
000148 Pos.Id Rel.Id Address Type Action
000149 00000002 00000002 00000850 A 4 +
000150 00000002 00000002 00000854 A 4 +
000151 00000002 00000003 00000858 V 4 ST
000152 >>
000153 Ordinary Symbol and Literal Cross Refere
000154 Symbol Length Value Id R Type Asm Program Defn References
000155 EXTADR 1 00000000 00000003 T 64 64
000156 FPX 4 00000838 00000002 F F 54 62 63
000157 HELLO 1 00000000 00000002 J 16 21U 79
000158 IH0001A 2 00000028 00000002 H H 32 28B
000159 R11 1 0000000B 00000001 A U 11 23M 24
000160 R12 1 0000000C 00000001 A U 12 19 20
000161 R13 1 0000000D 00000001 A U 13 19 22
000162 R14 1 0000000E 00000001 A U 14 19 35
000163 R15 1 0000000F 00000001 A U 15 20 36
000164 SAVE 4 00000880 00000002 F F 78 22M 23
000165 >>
000166 Unreferenced Symbols Defined in CSECT
*LIBUTIL

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```

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File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00 Columns 00001 00072
Command ==> Scroll ==> CSR

	Defn	Symbol
000167	63	AA
000168	62	AX
000169	64	AY
000170	39	BPAD
000171	40	BTRUNC
000172	48	CA
000173	43	CX1
000174	44	CX2
000175	45	CY
000176	46	CZ
000177	41	D
000178	42	F
000179	60	FPA
000180	61	FPB
000181	59	FPC
000182	55	FPX0
000183	56	FPX1
000184	57	FPY

*LIBUTIL

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File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00 Columns 00001 00072
Command ==> Scroll ==> CSR

000186	58	FPZ
000187	65	PKA
000188	66	PKB
000189	67	PKC
000190	68	PKD
000191	69	PKE
000192	70	PKF
000193	1	R0
000194	2	R1
000195	10	R10
000196	3	R3
000197	4	R4
000198	5	R5
000199	6	R6
000200	7	R7
000201	8	R8
000202	9	R9
000203	51	XALP
000204	50	XALPH

*LIBUTIL

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Vista TN3270 Session B

File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00 Columns 00001 00072
Command ==> Scroll ==> CSR

```
000205 49 XX
000206 52 XY
000207 53 XZ
000208 71 ZDA
000209 72 ZDB
000210 73 ZDC
000211 74 ZDD
000212 75 ZDE
000213 76 ZDF
000214 77 ZDGC
000215 »
000216 Macro and Copy Code Source Su
000217 Con Source Volume Members
000218 L1 SYS1.MACLIB ZARES1 SYSSTATE W
000219 »
000220 Using Map
000221
000222 Stmt -----Location----- Action -----Using-----
000223 Count Id Type Value Range Id
*LIBUTIL
```

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Vista TN3270 Session B

File Edit Font Transfer Macro Options Window Help

File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00 Columns 00001 00072
Command ==> Scroll ==> CSR

```
000224 21 00000006 00000002 USING ORDINARY 00000000 00001000 00000000
000225 »
000226 General Purpose Register Cross Refer
000227 Register References (M=modified, B=branch, U=USING, D=DROP, N=index)
000228 0(0) 19 35M
000229 1(1) 19 28M 35M
000230 2(2) 19 35M
000231 3(3) 19 35M
000232 4(4) 19 35M
000233 5(5) 19 35M
000234 6(6) 19 35M
000235 7(7) 19 35M
000236 8(8) 19 35M
000237 9(9) 19 35M
000238 10(A) 19 35M
000239 11(B) 19 23M 24 35M
000240 12(C) 19 20M 21U 35M
000241 13(D) 19 22 24N 34M 35
000242 14(E) 19 35M 37B
*LIBUTIL
```

MA 0.0 10/08/20.281 04:35PM 127.0.0.1 a 4,15

```
Vista TN3270 Session B
File Edit Font Transfer Macro Options Window Help
[Icons]
File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT          IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00          Columns 00001 00072
Command ==> _ Scroll ==> CSR
000243      15(F)      19      20      35M      36M
000244 »
000245          Diagnostic Cross Reference and Assemb
000246
000247      No Statements Flagged in this Assembly
000248  HIGH LEVEL ASSEMBLER, 5696-234, RELEASE 6.0, PTF UK37157
000249  SYSTEM: z/OS 01.10.00          JOBNAME: JOB1          STEPNAME: STEP1
000250  Data Sets Allocated for this Assembly
000251  Con DDname      Data Set Name          Volume      Memb
000252  P1 SYSIN        IBMUSER.SERGEV.ASM      ZAPRD1      HELL
000253  L1 SYSLIB       SYS1.MACLIB            ZARES1
000254  SYSLIN          SYS18281.T212948.RA000.JOB1.OBJ.H01  ZASYS1
000255  SYSPRINT        IBMUSER.SERGEV.LISTLIB  ZAPRD1      HELL
000256
000257      32120K allocated to Buffer Pool      Storage required      344K
000258      71 Primary Input Records Read      3410 Library Records Read
000259      0 ASMAOPT Records Read              262 Primary Print Records W
000260      8 Object Records Written              0 ADATA Records Written
000261  Assembly Start Time: 21.29.49 Stop Time: 21.29.49 Processor Time: 00.00
*LIBUTIL

MH 0.0 10/08/20.281 04:35PM 127.0.0.1  a 4,15

Vista TN3270 Session B
File Edit Font Transfer Macro Options Window Help
[Icons]
File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT          IBMUSER.SERGEV.LISTLIB(HELLO) - 01.00          Columns 00001 00072
Command ==> _ Scroll ==> CSR
000262  Return Code 000
***** ***** Bottom of Data *****
*LIBUTIL

MH 0.0 10/08/20.281 04:35PM 127.0.0.1  a 4,15
```

Рисунки 7 - 21 – Листинг

BPAD, BTRUNC – двоичные данные.

CX, CY, CZ, CA – символьные данные.

XX, XALPH, XALP, XY, XZ – шестнадцатеричные данные.

FPX, FPX0, FPX1, FPY, FPZ – данные с фиксированной точкой.

AX, AY, AA – адресные данные.

PKA, PKB, PKC, PKD, PKE, PKF – пакетные десятичные данные.

ZDA, ZDB, ZDC, ZDD, ZDE – зональные десятичные данные.

Представление команд:

1. STM R14,R12,12(R13)

Op code – 90 R1 – E R2 – C B2 – D D2 – 00C

Explicit Instruction Format – STM E,C,00C(D)

2. LR R12,R13

Op code – 18 R1 – C R2 – F

Explicit Instruction Format – LR C,F

3. ST R13,SAVE+4

Op code – 50 R1 – D X2 – 0 B2 – C D2 – 874

Explicit Instruction Format – ST D,874(0,C)

4. LA R11,SAVE

Op code – 41 R1 – B X2 – 0 B2 – C D2 – 870

Explicit Instruction Format – LA B,870(0,C)

5. ST R11,8(13)

Op code – 50 R1 – B X2 – D B2 – 0 D2 – 008

Explicit Instruction Format – ST B,008(D,0)

6. L R13,SAVE+4

Op code – 58 R1 – D X2 – 0 B2 – C D2 – 874

Explicit Instruction Format – L D,874(0,C)

7. LM R14,R12,12(R13)

Op code – 98 R1 – E R3 – C B2 – D D2 – 00C
Explicit Instruction Format – LM E,C,00C(D)

8. LA R15,0

Op code – 41 R1 – F X2 – 0 B2 – 0 D2 – 000
Explicit Instruction Format – LA F,000(0,0)

9. BR R14

Op code – 07 M1 – F R2 – E
Explicit Instruction Format – BR F,E

Выводы.

В ходе данной лабораторной работы было исследовано машинное представление команд и констант.