#### Задание 1

# CREATE TABLE new\_jobs AS (SELECT jobs.job\_id, jobs.job\_title, jobs.min\_salary, jobs.max\_salary, job\_history.employee\_id, job\_history.start\_date, job\_history.end\_date, job\_history.department\_id

## select \* from new\_jobs;

FROM jobs, job\_history);

∯ JOB_ID	∮ JOB_TITLE	⊕ EMPLOYEE_ID	⊕ DEPARTMENT_ID   ⊕ START_DA	TE   & END_DATE	⊕ MIN_SALARY   ⊕ N	IAX_SALARY
1 AD_PRES	President	102	60 13-JAN-01	24 - JUL - 06	20080	40000
2 AD_VP	Administration Vice President	102	60 13-JAN-01	24 - JUL - 06	15000	30000
3 AD_ASST	Administration Assistant	102	60 13-JAN-01	24 - JUL - 06	3000	6000
4 FI_MGR	Finance Manager	102	60 13-JAN-01	24 - JUL - 06	8200	16000
5 FI_ACCOUNT	Accountant	102	60 13-JAN-01	24 - JUL - 06	4200	9000
6 AC_MGR	Accounting Manager	102	60 13-JAN-01	24 - JUL - 06	8200	16000
7 AC_ACCOUNT	Public Accountant	102	60 13-JAN-01	24 - JUL - 06	4200	9000
8 SA_MAN	Sales Manager	102	60 13-JAN-01	24 - JUL - 06	10000	20080
9 SA_REP	Sales Representative	102	60 13-JAN-01	24 - JUL - 06	6000	12008
10 PU_MAN	Purchasing Manager	102	60 13-JAN-01	24 - JUL - 06	8000	15000
11 PU_CLERK	Purchasing Clerk	102	60 13-JAN-01	24 - JUL - 06	2500	5500
12 ST_MAN	Stock Manager	102	60 13-JAN-01	24 - JUL - 06	5500	8500
13 ST_CLERK	Stock Clerk	102	60 13-JAN-01	24 - JUL - 06	2008	5000
14 SH_CLERK	Shipping Clerk	102	60 13-JAN-01	24 - JUL - 06	2500	5500
15 IT_PROG	Programmer	102	60 13-JAN-01	24 - JUL - 06	4000	10000
16 MK_MAN	Marketing Manager	102	60 13-JAN-01	24 - JUL - 06	9000	15000
17 MK_REP	Marketing Representative	102	60 13-JAN-01	24 - JUL - 06	4000	9000
18 HR_REP	Human Resources Representative	102	60 13-JAN-01	24 - JUL - 06	4000	9000
19 PR_REP	Public Relations Representative	e 102	60 13-JAN-01	24 - JUL - 06	4500	10500
20 AD_PRES	President	101	110 21-SEP-97	27-0CT-01	20080	40000
21 AD_VP	Administration Vice President	101	110 21-SEP-97	27-0CT-01	15000	30000
22 AD_ASST	Administration Assistant	101	110 21-SEP-97	27-0CT-01	3000	6000
23 FI_MGR	Finance Manager	101	110 21-SEP-97	27-0CT-01	8200	16000
24 FI_ACCOUNT	Accountant	101	110 21-SEP-97	27-0CT-01	4200	9000

CREATE CLUSTER cluster\_1 (job\_id varchar(10)) SIZE 512; CREATE CLUSTER cluster\_2 (job\_id varchar(10)) SIZE 1024; CREATE CLUSTER cluster\_3 (job\_id varchar(10)) SIZE 2048; CREATE CLUSTER cluster\_4 (job\_id varchar(10)) SIZE 4096;

### Каждый кластер отличется размером ключа

	↑ TABLESPACE_NAME	PCT_FREE	♦ PCT_USED		∯ INI_TRANS	MAX_TRANS	INITIAL_EXTENT	NEXT_EXTENT	MIN_EXTENTS	MAX_EXTENTS		FREELISTS		AVG_BLOCKS_PER_KEY   CLUSTER_TYP
1 C_USER#	SYSTEM	10	40	372	2	255	65536	1048576	1	2147483645	(null)	1	1	(null) INDEX
2 C_TS#	SYSTEM	10	40	(null)	2	255	65536	1048576	1	2147483645	(null)	1	1	(null) INDEX
3 C_TOID_VERSION#	SYSTEM	10	40	(null)	2	255	16384	106496	1	2147483645	(null)	1	1	(null) INDEX
4 C_RG#	SYSTEM	10	40	(null)	2	255	65536	1048576	1	2147483645	(null)	1	1	(null) INDEX
5 C_OBJ#_INTCOL#	SYSTEM	5	40	(null)	2	255	2097152	204800	1	2147483645	(null)	1	1	(null) INDEX
6 C_0BJ#	SYSTEM	5	40	800	2	255	139264	204800	1	2147483645	(null)	1	1	(null) INDEX
7 C_ML OG#	SYSTEM	10	40	(null)	2	255	65536	1048576	1	2147483645	(null)	1	1	(null) INDEX
8 C_FILE#_BLOCK#	SYSTEM	10	40	225	2	255	24576	1048576	1	2147483645	(null)	1	1	(null) INDEX
9 C_COBJ#	SYSTEM	0	50	300	2	255	57344	1048576	1	2147483645	(null)	1	1	(null) INDEX
10 CLUSTERHASH	SYSTEM	10	40	512	2	255	65536	1048576	1	2147483645	(null)	1	1	(null) HASH
11 CLUSTER4	SYSTEM	10	40	4096	2	255	65536	1048576	1	2147483645	(null)	1	1	(null) INDEX
12 CLUSTER3	SYSTEM	10	40	2048	2	255	65536	1048576	1	2147483645	(null)	1	1	(null) INDEX
13 CLUSTER2	SYSTEM	10	40	1024	2	255	65536	1048576	1	2147483645	(null)	1	1	(null) INDEX
14 CLUSTER1	SYSTEM	10	40	512	2	255	65536	1048576	1	2147483645	(null)	1	1	(null) INDEX
15 SMON_SCN_TO_TIME_A	UX SYSAUX	10	(null)	(null)	2	255	65536	1048576	1	2147483645	(null)	(null)	(null)	(null) INDEX

Script	Output × 📆	xplainPlan 🗴 🔋	🛮 Autotrace 🗴 🖟	Query Resul	t 🗴 🕟 Query Resul	t 1 × 🀚 Query Result 2	x Duery Res	ult 3 × ⊳ Qı	uery Result 4 ×								
📌 🚇 i	🛍 🅦 SQL   i	All Rows Fetched:	15 in 0.191 second	s													
	MIN_EXTENTS	⊕ MAX_EXTENTS	⊕ PCT_INCREASE	FREELISTS	FREELIST_GROUPS	AVG_BLOCKS_PER_KEY	⊕ CLUSTER_TYPE	⊕ FUNCTION	⊕ HASHKEYS	DEGREE			⊕ BUFFER_POOL	⊕ FLASH_CACHE		\$ SINGLE_TABLE	⊕ DEPENDENCIES
1.	1	2147483645	(null)	1	1	(null	INDEX	(null)	0	1	1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
2 i	1	2147483645	(null)	1	1	(null	INDEX	(null)	0	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
3 i	1	2147483645	(null)	1	1	(null	INDEX	(null)	0	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
41	1	2147483645	(null)	1	1	(null	INDEX	(null)	0	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
51	1	2147483645	(null)	1	1	(null	INDEX	(null)	0	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
61	1	2147483645	(null)	1	1	(null	INDEX	(null)	0	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
7 i	1	2147483645	(null)	1	1	(null	INDEX	(null)	0	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
8 i	1	2147483645	(null)	1	1	(null	INDEX	(null)	0	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
9 i	1	2147483645	(null)	1	1	(null	INDEX	(null)	0	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
10	1	2147483645	(null)	1	1	(null	HASH	DEFAULT2	11	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
11)	1	2147483645	(null)	1	1	(null	INDEX	(null)	0	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
12 i	1	2147483645	(null)	1	1	(null)	INDEX	(null)	0	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
13 :	1	2147483645	(null)	1	1	(null)	INDEX	(null)	0	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
14)	1	2147483645	(null)	1	1	(null	INDEX	(null)	0	1	. 1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED
15 i	1	2147483645	(null)	(null)	(null)	(null	INDEX	(null)	0	1	1	N	DEFAULT	DEFAULT	DEFAULT	N	DISABLED

Задание 2 CREATE CLUSTER cluster\_hash(job\_id varchar(10)) SIZE 512 HASHKEYS 10; select \* from USER\_CLUSTERS;

	USTER_NAM		PACE_NAME (	PCT_FREE	PCT_USED		INI_TRANS	MAX_TRANS	INITIAL_EXTENT   0 NE		MIN_EXTENTS	MAX_EXTENTS			FREELISTS	FREELIST_GROUPS	# AVG_BLOCKS_PER_KEY	
1 C_USE		SYSTEM		10	40	372	2	255	65536	1048576	1			null)	1	1	(11022)	
2 C_TS#		SYSTEM		10	40	(null)	2	255	65536	1048576	1			null)	1	1	(null)	
	ID_VERSI			10	40	(null)	2	255	16384	106496	1	2147483645		null)	1	1	(null)	
4 C_RG#		SYSTEM		10	40	(null)	2	255	65536	1048576	1	2147483645		null)	1	1	(null)	
	J#_INTCO			5	40	(null)	2	255	2097152	204800	1	2147483645		null)	1	1	(,	
6 C_0BJ		SYSTEM		5	40	800	2	255	139264	204800	1	2147483645		null)	1	1	(/	
7 C_ML0		SYSTEM		10	40	(null)	2	255	65536	1048576	1	2147483645		null)	1	1	(null)	
	LE#_BLOC			10	40	225	2	255	24576	1048576	1	2147483645		nu11)	1	1	()	
9 C_COB		SYSTEM		0	50	300	2	255	57344	1048576	1			null)	1	1	(null)	
10 CLUST		SYSTEM		10	40	512	2	255	65536	1048576	1	2247403043		null)	1	1	(null)	
11 CLUST		SYSTEM		10	40	4096	2	255	65536	1048576	1			null)	1	1	(null)	
12 CLUST		SYSTEM		10	40	2048	2	255	65536	1048576	1			null)	1	1	(null)	
13 CLUST		SYSTEM		10	40	1024	2	255	65536	1048576	1	2147483645		null)	1	1	(null)	
14 CLUST		SYSTEM		10	40	512	2	255	65536	1048576	1	2147483645		null)	(null)	1	()	
		TIME_AUX SYSAUX	INCREASE !	10	(null)	(null)	VG BLOCKS	255 PER KEY   Ω CI I	65536	1048576	1 HKEYS  Ω DEGRE			null) HE∣Æ BUI		(null)		
			[INCREASE			,,			JSTER_TYPE   ⊕ FUNCT				ŒS  ⊕ CAC		FER_POOL	(} FLASH_CACHE	CELL_FLASH_CACHE   SII	
⊕ MIN_EXT	TENTS	MAX_EXTENTS  ⊕ PC1	- ,			,,		PER_KEY   CLI	USTER_TYPE   - FUNC X (null)		HKEYS  ⊕ DEGRE		ŒS  ⊕ CAC	HE  ⊕ BUI	FER_POOL	FLASH_CACHE	CELL_FLASH_CACHE   \$\frac{1}{2} \text{ SII}	NGLE_TABLE  ⊕ DEPE
⊕ MIN_EXT	TENTS	MAX_EXTENTS ∯ PC1 2147483645	(null)			GROUPS   ⊕ A		PER_KEY   ⊕ CLU	USTER_TYPE   FUNCT X (null) X (null)		HKEYS   († DEGRE	E @ INSTANC	ŒS  ⊕ CAC	HE ∯ BUI	FER_POOL	FLASH_CACHE   DEFAULT DEFAULT DE	CELL_FLASH_CACHE   \$\frac{1}{2} \text{ SII} FAUL T FAUL T	NGLE_TABLE   DEPE
⊕ MIN_EXT	TENTS 1	MAX_EXTENTS   ⊕ PC1 2147483645 2147483645	(null) (null)	FREELISTS   ()		SROUPS   ⊕ A		PER_KEY   ① CLU (null) INDE (null) INDE	USTER_TYPE   FUNC (null) X (null) X (null)		HKEYS  ⊕ DEGRE	E ∯ INSTANC 1	ŒS  ⊕ CAC	HE ∯ BUI DEFAI	FER_POOL JLT JLT JLT	FLASH_CACHE   10 DEFAULT DE DEFAULT DE DEFAULT DE	CELL_FLASH_CACHE   \$\frac{1}{2} \text{ SII} FAUL T FAUL T FAUL T	NGLE_TABLE   DEPE  N DISABL  N DISABL
∯ MIN_EXT	TENTS 1 1 1	MAX_EXTENTS   PCT 2147483645 2147483645 2147483645	(null) (null) (null)	FREELISTS   {}		FROUPS   ⊕ A		PER_KEY   CLU (null) INDE (null) INDE (null) INDE	USTER_TYPE   FUNC ( (null) ( (null) ( (null) ( (null) ( (null)		HKEYS   († DEGRE Ø Ø Ø	E P INSTANCE 1 1 1	ŒS  ⊕ CAC	DEFAI	FER_POOL JLT JLT JLT	FLASH_CACHE   DEFAULT DEDEFAULT DEDEFAULT DEDEFAULT DEDEFAULT DE	CELL_FLASH_CACHE   SII FAULT FAULT FAULT FAULT	NGLE_TABLE
∯ MIN_EXT	1 1 1 1	MAX_EXTENTS   PCT 2147483645 2147483645 2147483645 2147483645	(null) (null) (null) (null)	} FREELISTS		FROUPS   & A		PER_KEY   CLU (null) INDE (null) INDE (null) INDE (null) INDE	USTER_TYPE   FUNCT  X		HKEYS   DEGRE	E     (1) INSTANC 1 1 1 1	1 N 1 N 1 N 1 N 1 N	DEFAI DEFAI DEFAI	FER_POOL JLT JLT JLT JLT	FLASH_CACHE   DEFAULT	CELL_FLASH_CACHE   SIII FAULT FAULT FAULT FAULT FAULT	NGLE_TABLE   DEPE N DISABL N DISABL N DISABL N DISABL
∯ MIN_EXT	1 1 1 1 1 1	MAX_EXTENTS   PCT 2147483645 2147483645 2147483645 2147483645 2147483645	(null) (null) (null) (null) (null)	FREELISTS		1 1 1 1 1		PER_KEY () CLU (null) INDE (null) INDE (null) INDE (null) INDE (null) INDE	JSTER_TYPE   FUNC X		HKEYS   DEGRE	E     (1) INSTANC 1 1 1 1 1 1	1 N 1 N 1 N 1 N 1 N	DEFAI DEFAI DEFAI DEFAI DEFAI	FER_POOL  JLT  JLT  JLT  JLT  JLT  JLT	FLASH_CACHE  FLASH	CELL_FLASH_CACHE   SII FAULT FAULT FAULT FAULT FAULT FAULT	NGLE_TABLE   DEPE N DISABL N DISABL N DISABL N DISABL N DISABL
∯ MIN_EXT	1 1 1 1 1 1	MAX_EXTENTS   PCI 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645	(null) (null) (null) (null) (null) (null)	FREELISTS		1 1 1 1 1 1 1		PER_KEY () CLU (null) INDE	USTER_TYPE		HKEYS   († DEGRE	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 N 1 N 1 N 1 N 1 N	DEFAI DEFAI DEFAI DEFAI DEFAI	FER_POOL  JLT  JLT  JLT  JLT  JLT  JLT  JLT	FLASH_CACHE   DEFAULT DE	CELL_FLASH_CACHE   \$ SII FAULT FAULT FAULT FAULT FAULT FAULT	NGLE_TABLE ∯ DEPE N DISABL N DISABL N DISABL N DISABL N DISABL N DISABL
∯ MIN_EXT	1 1 1 1 1 1 1 1	MAX_EXTENTS   PCI 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645	(null) (null) (null) (null) (null) (null) (null) (null)	FREELISTS		1 1 1 1 1 1 1		PER_KEY   CLU (null) INDE	USTER_TYPE		HKEYS   DEGREE	E       INSTANC	1 N 1 N 1 N 1 N 1 N	DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI	FER_POOL  JLT  JLT  JLT  JLT  JLT  JLT  JLT	FLASH_CACHE   DEFAULT	CELL_FLASH_CACHE   \$ SII FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT	NGLE_TABLE  DEPE N DISABL
⊕ MIN_EXT	1 1 1 1 1 1 1 1	MAX_EXTENTS   PCI 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645	(null)	FREELISTS		1 1 1 1 1 1 1 1 1		PER_KEY   CLU (null) INDE	STER_TYPE   FUNC   FU	TION  ⊕ HASI	HKEYS & DEGRE	E	1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N N 1 N	DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI	FER_POOL  JLT  JLT  JLT  JLT  JLT  JLT  JLT	FLASH_CACHE   © PEFAULT DE PEFAUL	CELL_FLASH_CACHE   SII FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT	NGLE_TABLE   DEPE N DISABL
∯ MIN_EXT	TENTS   1	MAX_EXTENTS   PCI 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645	(null) (null) (null) (null) (null) (null) (null) (null) (null)	FREELISTS		1 1 1 1 1 1 1 1 1 1		PER_KEY   CLU (null) INDE	JSTER_TYPE   FUNC X (null) X (null) X (null) X (null) X (null) X (null) X (null) X (null) X (null)	TION  ⊕ HASI	HKEYS & DEGRE	E	1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N N 1 N	DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI	FER_POOL  ILT  ILT  ILT  ILT  ILT  ILT  ILT	FLASH_CACHE   FLASH_CACHE  DEFAULT  DE	CELL_FLASH_CACHE SIN FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT	NGLE_TABLE   DEPE N DISABL
∯ MIN_EXT	1 1 1 1 1 1 1 1 1 1	MAX_EXTENTS   P PCI 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645	(null)	FREELISTS		1 1 1 1 1 1 1 1 1 1 1		PER_KEY   CLI (null) INDE	USTER_TYPE   \$\frac{1}{2} FUNC.  X	TION  ⊕ HASI	HKEYS   DEGREE  0  0  0  0  0  0  0  0  11	E	1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N N 1 N	DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI DEFAI	FFER_POOL   ILT   ILT	FLASH_CACHE   FL	CELL_FLASH_CACHE   SII FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT	NGLE_TABLE DEPE  N DISABL
∯ MIN_EXT	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	MAX_EXTENTS   P PCI 21147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645	(null)	FREELISTS		FROUPS		PER_KEY   CLI (null) INDE	USTER_TYPE   FUNC X (null) X (null)	TION  ⊕ HASI	HKEYS	E	1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N N 1 N	DEFAI	FER_POOL  JLT  JLT  JLT  JLT  JLT  JLT  JLT	FLASH_CACHE   FL	CELL_FLASH_CACHE   SII FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT FAULT	NGLE_TABLE   DEPE N DISABL
∯ MIN_EXT	TENTS   1	MAX_EXTENTS   P PCI 21147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645 2147483645	(null)	FREELISTS		SROUPS		PER_KEY   CLI (null) INDE	USTER_TYPE   FUNC X	TION  ⊕ HASI	HKEYS	E	1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N 1 N N N 1 N	DEFAI	FER_POOL  JLT  JLT  JLT  JLT  JLT  JLT  JLT	FLASH_CACHE   FL	CELL_FLASH_CACHE SIN FAULT	NGLE_TABLE   DEPE  N DISABL

## Задание 3 CREATE TYPE employees\_typ AS OBJECT ( employee\_id NUMBER(6), first\_name VARCHAR2(20), last\_name VARCHAR2(25), email VARCHAR2(25), phone\_number VARCHAR2(20), hire\_date DATE CONSTRAINT, job\_id VARCHAR2(10), NUMBER(8,2), salary commission\_pct NUMBER(2,2), manager\_id NUMBER(6), department\_id NUMBER(4) );

CREATE TABLE employee\_nested1(emp\_nest1 employees\_type ) NESTED TABLE empNest1 STORE AS NESTED\_CHAIRS;

CREATE TABLE employee\_nested2 (emp\_nest2 employees\_type) NESTED TABLE empNest2 STORE AS NESTED\_CHAIRS RETURN AS VALUE;

CREATE TABLE employee\_nested3 (emp\_nest3 employees\_type ) NESTED TABLE empNest3 STORE AS NESTED\_CHAIRS RETURN AS LOCATOR;

```
Задание 4

CREATE TYPE employee_type AS OBJECT (
employee_id NUMBER(1),
job_id varchar(10)
);
```

CREATE TABLE employee\_table OF employee\_type;