

ch1

File-based sys: collection of data stored in an orderly manner in
permanant file

Q1, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

1- Data redundancy and inconsistency : various copies of ~~the~~ the same data may no longer agree (inconsistency)

2- Difficulty in accessing Data : need to write new program to carry out each new task.

3- Data isolation : writing new app programs to retrive the appropriate data is difficult.

4- integrity problems : Hard to add new constraints or change existing ones.

5- Atomicity of updates : failures may leave database in inconsistent state with partial updates carried out.

6- concurrent access by multiple users : uncontrolled concurrent accesses can lead to inconsistency.

7- security problems

database approach: new approach in managing large amounts of organizational information and we use it to solve difficulties from using file-based system

(2)

2019 → Database: A collection of related data used to support the activities of a particular organization / can be viewed as a repository of data that is defined once and then accessed by various users

2019 → DBMS: A software system designed to manage a database
or A collection of programs that enable users to create and maintain a database and control all access to it.

primary goal of DBMS: provide environment that is both convenient and efficient for users to retrieve and store information

2019 → Database System: the DBMS software together with data itself, sometimes the applications are also included.

DBMS used in: (Banking - Airlines - Universities - Sales - Manufacturing - Human resources)

characteristics ^{and benefits} of Database 2019 : file-based system

- 1 - self-describing nature of a database system
- 2 - insulation between program and data (data independence)
- 3 - support for multiple views of data
- 4 - sharing of data and multiuser system
- 5 - control of data redundancy
- 6 - Enforcement of integrity constraints
- 7 - Restriction of unauthorized access
- 8 - Transaction processing
- 9 - Backup and recovery facilities

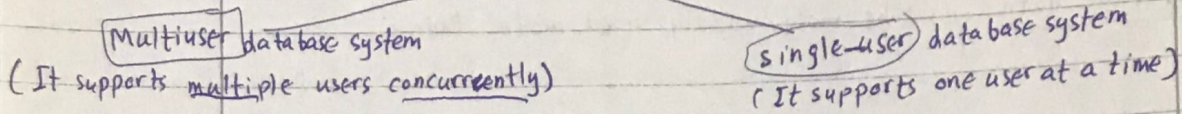
2019 → Disadvantages of DBMS: 1 - complexity 2 - size

3 - cost of DBMS 4 - Additional Hardware cost

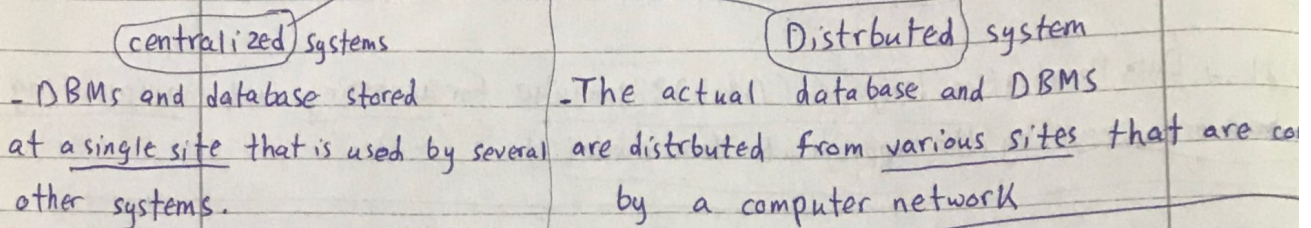
3

2021 - classification of DataBase system

2021 → classification Based on User numbers



2021 → Based on DataBase Distribution



2017 → levels of Abstraction :- (one sentence at each one)

1-physical level: the lowest level of abstraction describes how data actually stored

2-logical level: The higher level of abstraction describes what data are stored in data and what relationships exist among those data.

3-view level: The highest level of abstraction describes only part of the entire database

~~2017~~ Database schema: the overall design of the database

~~2017~~ Database Instance: the collection of information stored in the database at particular moment.

physical schema: describe the database design at physical level

logical schema: describe the database design at logical level

subschemas: describe different views of the database

components of DBMS: 1- the storage manager

2- the query processor

3- the transaction manager

(4)

2021 data model: is a collection of concepts for describing (data-data relationships - data constraints),

Relational model of data is the most widely used model today

2018, 21 → Data Definition Language (DDL): is a computer language used to create and modify the structure of database objects in a database

2018, 2021 → Data Manipulation language (DML): language for accessing and manipulating the data organized by the appropriate data model.

~~2021~~ List Data phase design phases: 1- ~~The initial phase~~

2- ~~conceptual design phase~~

3- ~~logical design phase~~

4- ~~Physical design phase~~

2021, Metadata: information about the schema or structure of the data

data-definition language → specify the database schema

data-manipulation language → express database queries and updates

2021, List Database design phase: 1-initial phase: characterize fully the data needs of the prospective database users

2- The conceptual design phase: The process of moving from an abstract data model to the implementation of the database proceeds in two final design phases

3- Logical design phase: the designer maps the high-level conceptual scheme onto the implementation data model.

4- Physical design Phase: Deciding on the physical layout of the database

2021, 2019, 2018, 17 → Explain distinctions among terms primary Key, candidate Key and super Key?

Super Key: set of one or more attributes that taken collectively allow us to identify uniquely a tuple in the relation

Candidate Key: is a simple (one attribute) or composite (more attributes) Key that is unique and minimal identify

* super Key is candidate Key if it's minimal

* one of the candidate Key is selected to be the primary Key

Primary Key: Is a candidate Key selected by the database designer to used as an identifying mechanism for the relation. it must uniquely identify tuples in a table and not null

Foreign Key: an attribute in table that references primary Key in another table and both of them must be the same data type

2019 → Database schema: the logical design of the database

2019 → Database Instance: A snapshot of the data in the database at a given instant time.

Relation schema: The logical design of the relation. the name of the relation and set of attributes for that relation.

2021, 18 → Define cardinality and list types of cardinality for binary relationship?

Cardinality: expresses the maximum number of entities that can be associated with another entity via relationship.

types: 1- one to one 2- one to many
3- many to one 4- many to many

⑥

Participation: expresses the minimum number of entites that can be associated with another entity via relationship.

→ 2018 Total participation: every entity in the entity set participates ⁱⁿ at least one relationship in the relationship set.

→ 2018 Partial participation: some entites may not participate in any relationship in the relationship ~~set~~ set.

→ 2019 Explain difference between weak and strong entity?

	strong Entity	weak entity
Key	- always have primary Key	- it uses a foreign Key combined with its attributed to form the primary Key
Dependency	doesn't depend on other entites	its existance depend on the existance of <u>identifying entity set</u>
Participation	may or may not participate participate in entity relationships	always participates in entity relationships
Represented by	represented by single rectanagle	represented by double rectangle