Operations

DDL Operations

Create a Type

```
FUNCTION createType
   create a new record
   GET type name from user
   add type name to the record
   GET number of fields from user
   FOREACH field
      GET name from user
      add field to the record
   END FOREACH
   OPEN system catalog
   go to last page in system catalog
   add this record after the last record in last page
   update number of records in page header
   IF there is no empty record slots in the last page
      create a new page
      add page number to newly created page header
   END IF
   SAVE and CLOSE system catalog
   create a file with type name
   OPEN the file
   create a new page
   add page number to newly created page header
   SAVE and CLOSE the file
END createType
```

Delete a Type

```
FUNCTION deleteType
   GET type name from user
   OPEN system catalog
   FOREACH page in system catalog
      read number of records from page header
      FOREACH record in that page
         IF old record is deleted
            shift the current record by one record to the left
         ELSE IF key field of the current record matches the user input
            extract old record
         END IF
      END FOREACH
   END FOREACH
   IF there is no type names in the last page
      delete this page
      update number of pages in system catalog header
   END IF
   IF old record is NOT deleted
      delete the last record
   END IF
   IF there is no records in the last page
      delete last page
   END IF
   update number of records in last page header
   SAVE and CLOSE system catalog
   OPEN the file
   delete all pages and records of that file
   SAVE and CLOSE the file
END deleteType
```

List all Types

```
FUNCTION listAllTypes
  OPEN system catalog
  FOREACH page in system catalog
    read number of records from page header
    FOREACH record in that page
      PRINT type name and number of fields and field names
    END FOREACH
  END FOREACH
  CLOSE system catalog
END listAllTypes
```

DML Operations

```
FUNCTION chooseDML(operation type)
  GET type name from user
  OPEN system catalog
  FOREACH page in system catalog
    read number of records from page header
    FOREACH record in that page
      IF type name matches the user input
        CALL the function according to the operation type
        BREAK ALL
      END IF
    END FOREACH
  END FOREACH
  CLOSE system catalog
END chooseDML
```

Create a Record

```
FUNCTION createRecord(number of fields)
  OPEN the file
  create a new record
  FOREACH field
    GET value from user
    add field to the record
  END FOREACH
  FOREACH page in that file
    read number of records from page header
    FOREACH record in that page
      IF new record is inserted
        shift the current record by one record to the right
      ELSE IF key field of the new record is less than key field of the current record
        insert new record before current record
      END IF
    END FOREACH
  END FOREACH
  IF new record is inserted
    insert the last shifted record
  ELSE
    insert new record
  END IF
  update number of records in last page header
  IF there is no empty record slots in the last page
    create a new page
    add page number to newly created page header
  END IF
  SAVE and CLOSE the file
END createRecord
```

Delete a Record

```
FUNCTION deleteRecord
   OPEN the file
   GET key field from user
   FOREACH page in that file
      read number of records from page header
      FOREACH record in that page
         IF old record is deleted
            shift the current record by one record to the left
         ELSE IF key field of the current record matches the user input
            extract old record
         END IF
      END FOREACH
   END FOREACH
   IF old record is NOT deleted
      delete the last record
   END IF
   IF there is no records in the last page
      delete last page
   END IF
   update number of records in last page header
   SAVE and CLOSE the file
END deleteRecord
```

Update a Record

```
FUNCTION updateRecord(number of fields)
   OPEN the file
   create a new record
   FOREACH field
      GET value from user
      add field to the record
   END FOREACH
   FOREACH page in that file
      read number of records from page header
      FOREACH record in that page
         IF key field of the current record matches the user input
            insert new record
            BREAK ALL
         END IF
      END FOREACH
   END FOREACH
   SAVE and CLOSE the file
END updateRecord
```

Search for a Record

```
FUNCTION searchRecord
  GET search operator from user
  GET searched value from user
  OPEN the file
  FOREACH page in that file
    FOREACH record in that page
      IF search operator is <
        IF key field is less than searched value
          PRINT all fields of that record
        ELSE
          BREAK ALL
        END IF
      ELSE IF search operator is > AND key field is more than searched value
        PRINT all fields of that record
      ELSE IF search operator is = AND key field is equal to searched value
        PRINT all fields of that record
        BREAK ALL
      END IF
    END FOREACH
  END FOREACH
  CLOSE the file
END searchRecord
```

List all Records

```
FUNCTION listAllRecords
  OPEN the file
  FOREACH page in that file
    FOREACH record in that page
      PRINT all fields of that record
    END FOREACH
  END FOREACH
  CLOSE the file
END listAllRecords
```