Project Design Document

Group Name: Alpha_X

Topic : Photo Search Engine

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Summary statement of problem

Now a day taking a photo is very popular.From our research Matthew Brogie - Resply discovered that the average number of photos taken in US is about 20.2 per day.when a number of the photo is too large,it is harder for user to look up the specific photos that user want to look for.

This program will allow the user to search the photo that belong to the tag that user given with in the efficient way and allow the user to modify the tags of the photos ,The program also have a function to display a photo that user satisfy to the web browser

Program Ability

- Allow the user to add,delete the tag from the photo that user selected.

- Allow the user to search for photo(s) with tags that match the user satisfy.

- Allow the user to search for photo(s) with tags that match the user want and do not have any tags from a second set.

- Allow the user to select the page from the list and ask to see the most three most similar , similar is calculate.

- Allow the user to select one photo and display it on the web browser.

Requirement list

- The system must record all information of each photo tag detail

- The system must be working on any computer that operating on Linux

- The system must allow the user to select one of the photo and display it in the default browser.

- The system must find and display a list of all photo with the muti tags that user given

- The system must find and display a list of all photo with the multiple tags that user given and don't have any tags from the second set.

- The system must allow the user to add,delete the tag from the photo that user selected

- The system must allow the user to select one of the photo from a list and then The system find the most three similar photo, where "similar" is calculate by the number of sharing tags

- The system must be able to handle an unlimited number of photos

- The system must allowed the user to have the unlimited number of tag in each photo

- The system will work only with English tags and photo files

Use case diagram

All Use case name:

1. Add or delete a tag from the photo that user selected
2. Search for photo(s) with tags that match user need
3. Search for photo(s) with tags that match user need with the condition that don't have any tags from a second set
4. Find similar of the photo and display most top three similar photo(s)

5. Select the photo and display to web browser

1. **Use case name :** Add or delete a tag.
Actor : User
Goal : Add or delete a tag from the photo that user selected.
Main success narrative:

1.System display all of the photos and ask of the photo that user want to add/delete
2.User selects one of the photo to add tag or delete.
3.System asks the user want to add or delete.
4.User select the option add/delete
5.System asks the user to enter name tag for add or delete.(depend on user choice)
6.User input the name tag that user want to add/delete
7.System asks the user to confirm edit.
8.User enter confirm
9.System update the data

Alternative narrative 1:

2.User input the photo that are not in the database.
3.System go the main menu

Alternative narrative 2:

4.User input wrong option selected (not add /delete)
5.System repeat ask user to select option add or delete until it is valid

Alternative narrative 3:

8.User not confirm
9.System go to main menu with out update the data

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2. **Use case choose**: Search for photo(s) with tags that match user need
Actor: Any system user
Goal: To find the photo that include the tag that user given
Main success narrative:

1.System asks user to enter the tag of the photo that user want to find
2.User enter the information of tag
3.System search the photo matched the condition include tag display the result

Alternative narrative 1:

3.System not find the photo that match user condition
4.System print a error message and go back to main menu

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3. **Use case choose**: Search for photo(s) with tags that match user need with the condition that don't have any tags from a second set.
Actor: Any system user
Goal: To find the photo that include the tag that user given
Main success narrative:

1.System asks user to enter the tag of the photo that user want to find, and the second set of tag that user do not want to include.
2.User enter the information of tag and exception tags
3.System search the photo matched the condition include tags and exception tags and display the result

Alternative narrative 1:

3.System not find the photo that match user condition
4.System print there no match and go back to main menu

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4. **Use case name:** Find similar of the photo and display most top three similar photo(s)

Actor: Any System User
Goal: Find the most 3 similar photo and display on the screen
Main success narrative:

1.System ask the user “do you want to find the similar photo ”
2.User confirm yes
3.System ask user to enter photo from the the list result of a previous search
4.User enter the photo
5.System use memory in database to find out 3 similar photos
6.System display 3 similar photos on the screen

Alternative narrative 1:

2.User not confirm
3.System go to main menu

Alternative narrative 2:

4.User enter the photo that not in the database
5.System print error message and go back to main menu

----

5. **Use case name:** Select the photo and display to web browser

Actor: Any System User
Goal: display the photo that user want to the web browser
Main success narrative:

1.System ask the user to display the photo to web browser
2.User confirm
3.System ask the user to enter the photo
4.User enter the photo
5.System display the photo to web browser
6.System go

Alternative narrative 1:

2.User not confirm
3.System go to the main menu

Alternative narrative 2:

4.User enter the photo that not in the list of the result or not in the database
5.System display error message and system repeat ask the user to enter the valid photo

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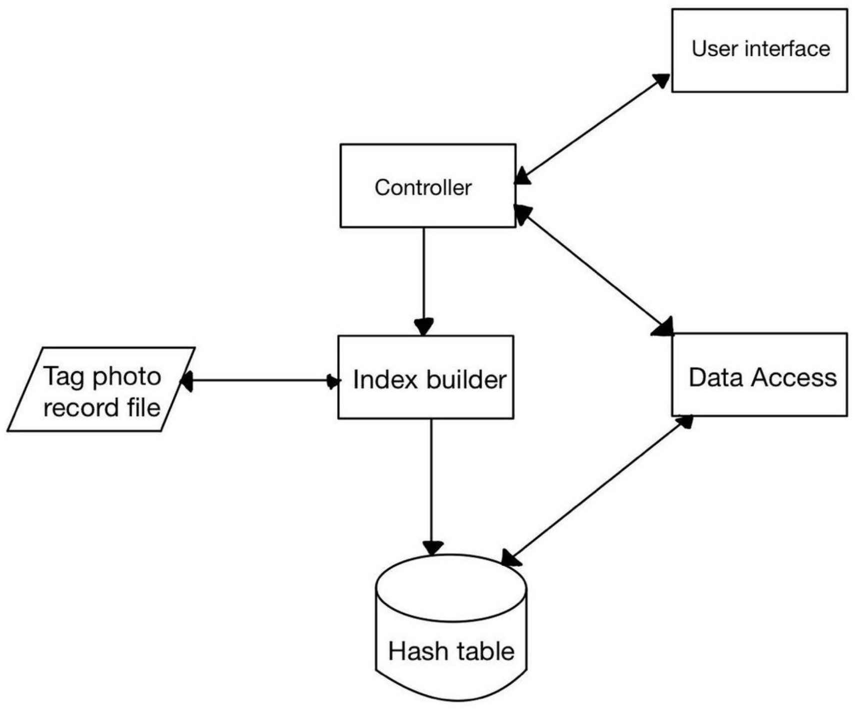
Architecture diagram



Controller : Receive the command from the user and also display the data
- use data access module to search the photo and display the result
- ask the user option what user want to do(search,add/delete tag option)
- use index builder to update the tag of the photo to tag photo record file when user add or delete the tags
- use index builder to update the tag of the photo to hash table when user add or delete the tags

Index builder :
- setup the data structure at the beginning of the program
- update the tag of the photo to tag photo record file

User interface: Graphic of the program
- display main menu page
- display search by tag page
- display search by tag with the condition page
- display the image to the web browser

Data Access : Search the data of the database
- Search the photo with the tag that user given from the hash table and return the data to controller in term of linklist
- Search the photo with the tag and condition exception and return the data to controller in term of linklist

Data structures used

Photo Structure

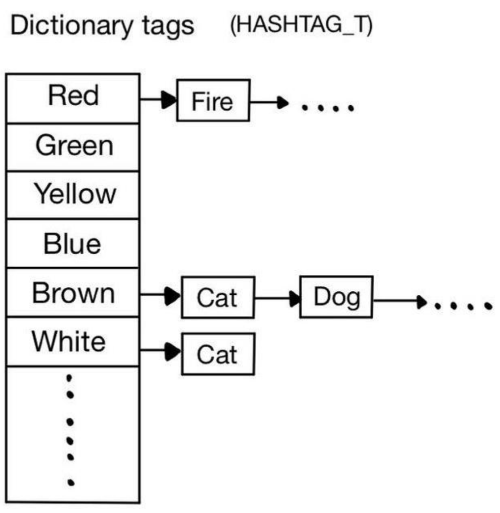
```
typedef struct _listtag
   {
   /*linklist of tags*/
   char* nametag; /*name of the tag*/
   struct _listtag *next;
   }LIST_TAG_T;

typedef struct _photo
{
   char photoname[256];/*name of the photo*/
   char path[512];/*path of photo*/
   int numtag; /*number of the tag*/
   int count; /*use for calculate the similar*/
   int state; /*use as a flag of calculation,use in search
tag and find similar
   true => already be the result of the search
   False => not already the result of the search*/

   LIST_TAG_T *alltag; /*list of all tag*/

   struct _photo *next;/*use for search return as a list*/
}PHOTO_T;
```

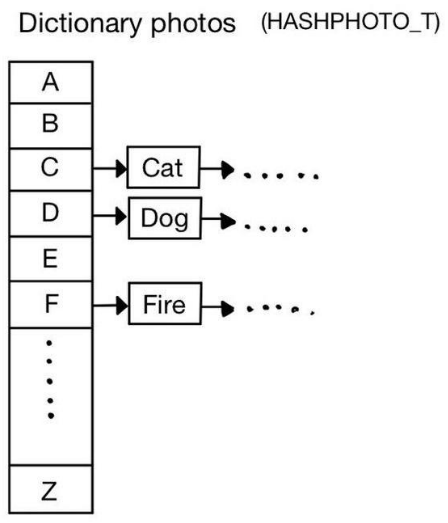
Hash of the tagTable Item

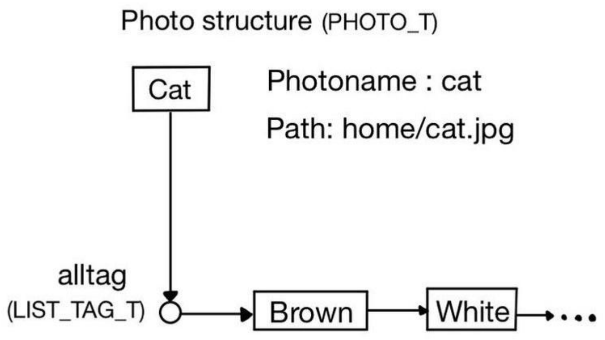
```
typedef struct _hashtag
{
   PHOTO_T* photo;
   struct _hashtag *next;
}HASHTAG_T;
```

Hash of the photo Table Item

```
typedef struct _hashphoto
{
   PHOTO_T* photo;
   struct _hashphoto *next;
}HASHPHOTO_T;
```







1. HASHTAG_T
   - hash table
   - use for look up the photo with the giving tag
   - use in search by tag
2. HASHPHOTO_T
   - hash table
   - use for look up the photo information by search with the name of the photo
   - use in find similar of the photo

Tag photo record file

The file that record the all of the tag photo will represent in a text file as below.

```
------------------------------------------------------------------------------------------------
[name of photo] [number of the tag] [path]
[name tag 1][name tag2] .....[name tag N]
```

Example:

```
    Cat 2 home/cat.jpg
    Cat of Siam
    Brown white
    Dog 2
    Dog of siam
    Brown Black
    Fire 1 /picture/dog.jpg

    Red
    .
    .
    .
------------------------------------------------------------------------------------------------
```

Pseudocode

1. Find the photo information with the name photo

```
findphoto (name photo):
set key = photo[0] - 'A'
set data = dictphoto[key]
Set Result to NULL
while data is not NULL
   if data->photo->photoname match name photo
      Result = data
   data = data->next
Return Result
```

2. Add the tag

```
Program ask a name of the photo and tags[]
data = findphoto(name photo)
Add data->numtag with size of tags[]
if data is not NULL
   head = data->alltag
   For tag in tags[]
      Allocate temp(LIST_TAG) and assign tag to temp->nametag
      temp->next = head->next
      Head->next = temp
```

3. Delete the tag

```
Program ask a name of the photo and tags[]
data = findphoto(photo)
tag = data->photo->alltag
while tag is not NULL
   If tag->next->nametag is in tags[]
      modify the linklist by delete the tag and add new link
   tag = tag->next
```

4. Check is the photo have the given tag or not

```
checktag(photo,name tag):
Set the result to false
   tag = photo->alltag
   While tag is not null
      If tag->nametag is match to name tag
         Result = true
      tag = tag->next
Return result
```

5. Search for photo(s) with tags that match user need

```
Program ask a name tags[] from user
Set listresult = NULL
For tag in tags[]
   set key = hashfunction(tag->nametag)
   listphoto = dicttag[key]
   while listphoto is not NULL
      if listphoto->photo->state is false
         if all of listphoto tag is in tags[]
            add the photo to the listresult(linklist)
            set listphoto->photo->state to true
      listphoto = listphoto->next
While loop listResult
   Set all photo->state in list to false
Return listResult
```

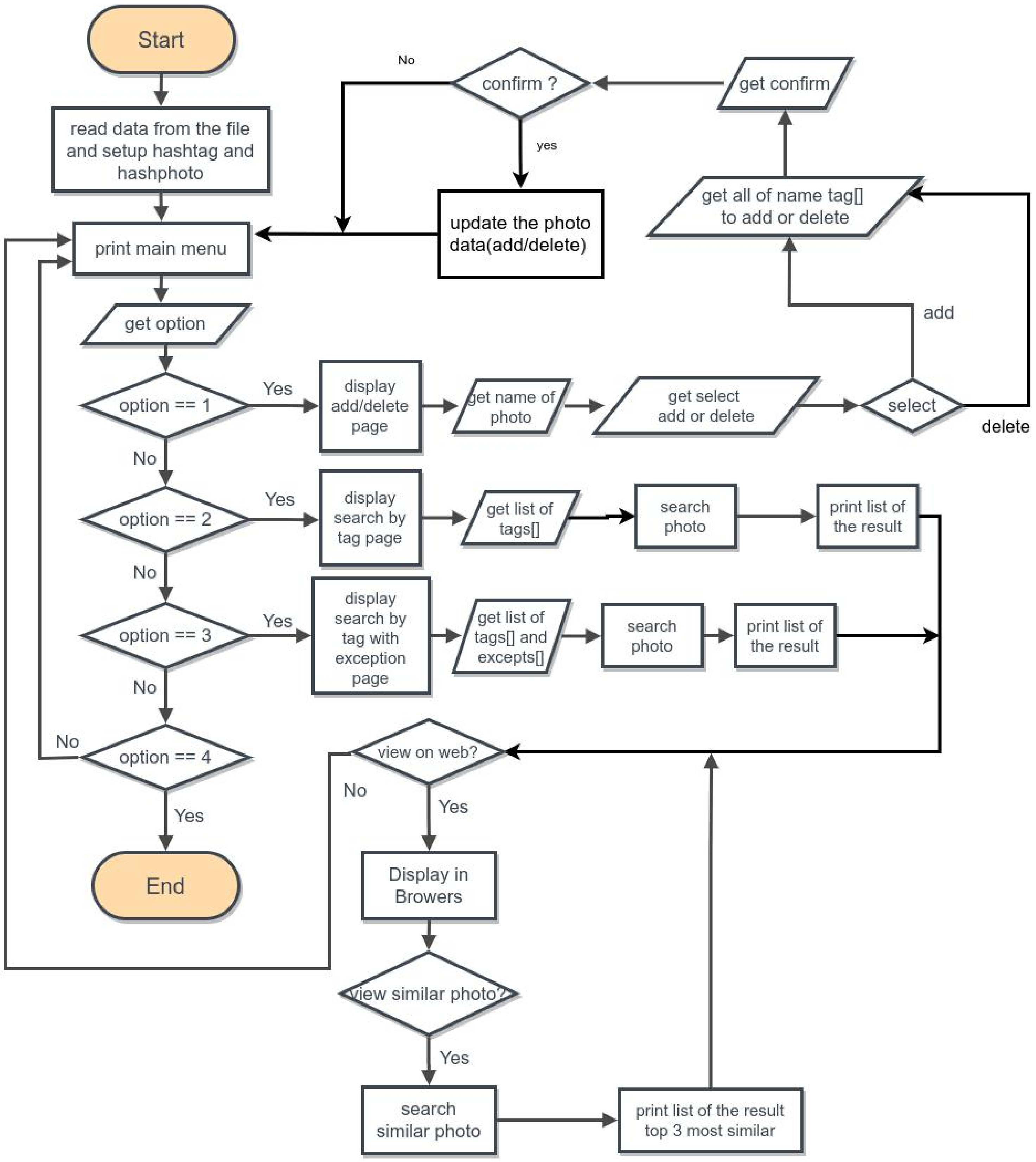
6. Search for photo(s) with tags that match user need with the condition that don't have any tags from a second set

```
Program ask a name tags[] and excepts[] from user
Set listresult = NULL
For tag in tags[]
   set key = hashfunction(tag->nametag)
   listphoto = dicttag[key]
   while  listphoto is not NULL
      if listphoto->photo->state is false
         if all of listphoto tag is in tags[] and not in
      except[]
            add the photo to the listresult(linklist)
            set listphoto->photo->state to true
      listphoto = listphoto->next
While loop listResult
   Set all photo->state in list to false
Return listresult
```

7. Find similar

```
Program ask the user to enter a name photo
data = findphoto(name photo)
tag = data->alltag
**initial:**
while tag is not null
   set key = hashfunction(tag->nametag)
   listphoto = dicttag[key]
   Loop the list of photo
      let photo->count equal to 0
      photo->state = false
      listphoto = listphoto->next
   tag = tag->next
**calculate similar:**
while tag is not null
   set key = hashfunction(tag->nametag)
   listphoto = dicttag[key]
   Loop the list of photo
      increase photo->count by one
      listphoto = listphoto->next
   tag = tag->next
**add to priority queue:**
while tag is not null
   set key = hashfunction(tag->nametag)
   listphoto = dicttag[key]
   Loop the list of photo
      if photo->state is false
         Add the photo to priority queue
         let photo->state be true
      listphoto = listphoto->next
   tag = tag->next
 Pop priority queue 3 time and print the result
```

Overview flowchart


Start
read data from the file and setup hashtag and hashphoto
print main menu
get option
option == 1
Yes
display add/delete page
get name of photo
get select add or delete
select
add
delete
get all of name tag[] to add or delete
get confirm
confirm ?
No
yes
update the photo data(add/delete)
No
option == 2
Yes
display search by tag page
get list of tags[]
search photo
print list of the result
No
option == 3
Yes
display search by tag with exception page
get list of tags[] and excepts[]
search photo
print list of the result
No
option == 4
No
Yes
End
view on web?
No
Yes
Display in Browers
view similar photo?
Yes
search similar photo
print list of the result top 3 most similar