

# SE 3XA3: Module Interface Specification

## Google Images Downloader

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### Introduction

This document shows the complete specification for implementing all modules of the Google Images Downloader program.

Date	Name	Version	Notes
1/21/2020	Joshua	1.0	Created document
3/11/2020	Sam	1.1	Set up format of document
3/11/2020	Sam	1.1.1	Set up skeleton of each module
3/11/2020	Joshua	1.1.2	Input and Navigate Page Module
3/12/2020	Nick	1.1.3	Search Query and Main Module
3/13/2020	Sam	1.1.4	Output Module
3/13/2020	Joshua, Sam, Nick	1.2	General Edits

Table 1: **Revision History**

# Input Format Module

## Module

Input

## Uses

None

## Syntax

### Exported Types

None

### Exported Constants

None

### Exported Access Programs

Routine name	In	Out	Exceptions
userInput	N/A	dict	InvalidParam, MissingParam

## Semantics

### Environmental Variables

None

### State Variables

None

### State Invariant

None

### Assumptions & Design Decisions

- The `userInput` method is called by Main before any other method.

### Access Routine Semantics

`userInput()`:

- output: *out* := A dictionary (key:value pair) of parameters and their values. The keys are the parameters and the values are the user input.
- exception: *exc* := (required parameter missing  $\Rightarrow$  *MissingParam* | improper format for a parameter  $\Rightarrow$  *InvalidParam*)

## Local Functions

keywordFromFile: string  $\rightarrow$  dict

keywordFromFile( $s$ )  $\equiv$  Reads in file  $s$  of parameters and their associated values.

exception:  $exc :=$  (can't find file  $\Rightarrow$  *InvalidFileName* | can't read file  $\Rightarrow$  *UnableToParseFile* | required parameter missing  $\Rightarrow$  *MissingParam* | improper format for a parameter  $\Rightarrow$  *InvalidParam*)

# Search Query Module

## Module

SearchQuery

## Uses

None

## Syntax

### Exported Types

None

### Exported Constants

None

### Exported Access Programs

Routine name	In	Out	Exceptions
buildURL	dict of string	string	None

## Semantics

### Environmental Variables

None

### State Variables

None

### State Invariant

None

### Assumptions & Design Decisions

- All input arguments stored in the dictionary of strings are correct and in the proper format

### Access Routine Semantics

buildURL(*dS*):

- output: *out* := “https://www.google.com/search?q=&espv=2&sxsrf=ACYBGNSwqBUElVjmEWOTu3-mXPnReqFoLw:1581376760401&source=lnms” + buildURLParam(*dS*) + “isch&sa=X&ved=2ahUKEwiY7bzAj8jnAhUQjq0KHbXwBEYQ\_AUoAXoECBMQAaw&biw=838&bih=880”
- exception: none

## Local Functions

buildURLParam: dict of string  $\rightarrow$  string  
buildURLParam( $dS$ )  $\equiv s$  such that:  
     $s = \text{“”}$   
    for all  $i$  in  $dS$ :  
         $s = s + i$

# Navigate Page Module

## Module

NavigatePage

## Uses

None

## Syntax

### Exported Types

None

### Exported Constants

None

### Exported Access Programs

Routine name	In	Out	Exceptions
getImageURL	string, $\mathbb{Z}$	list of string	None

## Semantics

### Environmental Variables

### State Variables

None

### State Invariant

None

### Assumptions & Design Decisions

- The link passed into the `getImageURL` method is correct and corresponds to a real link.
- The user has setup the program correctly (correct chromedriver in right location, installed selenium, put correct location of Google Chrome binary).

### Access Routine Semantics

`getImageURL( $s, n$ )`:

- output:  $out :=$  a list ( $urls$ ) of image URLs from  $s$  where  $|urls| = n$ .
- exception: None

# Output Format Module

## Module

Output

## Uses

None

## Syntax

### Exported Types

None

### Exported Constants

None

### Exported Access Programs

Routine name	In	Out	Exceptions
downloadImages	list of string, string, string	None	None

## Semantics

### Environmental Variables

None

### State Variables

None

### State Invariant

None

### Assumptions & Design Decisions

- The first string parameter (the download location) in the `downloadImages` method is optional and has a default value (“./Images”).
- The `createDirectory` method creates a directory with the file path  $loc + “/” + key$ .

## Local Functions

`createDirectory(loc, key):  $\epsilon$`   
 `$createDirectory(loc, key) \equiv \text{Null}$`

### Access Routine Semantics

`downloadImages(lst, loc, key):`

- output: save each image represented by a string in *lst* and save it to the folder created by the `createDirectory` method.
- exception: none



# Main Module

## Module

Main

## Uses

Input, SearchQuery, NavigatePage, Output

## Syntax

### Exported Types

None

### Exported Constants

None

### Exported Access Programs

None

## Semantics

### Environmental Variables

System Console

### State Variables

None

### State Invariant

None

### Assumptions & Design Decisions

- The main function in the Main module is used to call all the other modules in order to run them in the right order. The main function will call the modules in the following order: Input, SearchQuery, NavigatePage, Output.

### Access Routine Semantics

None

## Local Functions

main:  $\epsilon \rightarrow \epsilon$

main()  $\equiv$  Null