

ABC PRODUCT SEARCH DESIGN

1. Introduction

A Global Toy retailer “ABC” is looking to add a comprehensive search feature to their online store.

2. Use Cases

The sole supported use case is a website visitor submits a product search based on various product attributes and filters.

3. Requirements

Product Requirements

ID	Requirement	Priorit y
PRD-S C-0100	100,000 unique visitors to online store each day from users located all around the world.	Must Have
PRD-UI -0100	Search for products based on various attributes product name, product info, product description, price range (not implemented), stock availability (unavailable in source data), ratings (unavailable in source data), category, and subcategory (unavailable in source data).	Must Have
PRD-B E-0100	System should allow wildcard search for products.	Must Have
PRD-B E-0200	System should list the products sorted by ratings (not available in chosen test data) and price.	Must Have

- PRD – PRODUCT REQUIREMENT DOCUMENT
- SC – SCALE
- UI – User Interface
- BE – Backend

Design Requirements

ID	Requirement	Priority
DD-SC-0100	Search service must support sustained 1.2 searches per second at all times. (See Assumption and Limitations section below.)	Required
DD-SC-200	Search service must support bursts of up to 24 searches per second sustained for short durations (1-2 hours). (See Assumption and Limitations section below.)	Optional
DD-SEC-0100	Protect against DDOS, cross site scripting, sql injection, and other attack vectors.	Required
DD-UI-0200	Support pagination on product search responses.	Optional

- DD – DESIGN DOCUMENT REQUIREMENT
- SEC - SECURITY

4. Assumptions and Limitations

1. Even distribution of visitor sessions throughout the day.
2. “Session” equates to “user search executed” – which equates to 1.2 searches per second.
3. Handles sustained bursts to 20x searches per second – 24 searches per second.
4. Product prices limited to USD.
5. Product details limited to English.

5. Operation

1. cd to project root directory
2. ./mvnw spring-boot:run

Although this a Proof of Concept, the application is fully operational. Although operational, it lacks the following software maturity elements:

- unit tests
- error handling
- javadoc
- automated interface generation - use of something like Swagger
- data model could be further broken apart in the company area
- MVC or AJAX for UI
- Further second level cache usage.
- Rating data

- Stock data
- Product links
- Integration and system level test plans

6. Interfaces

Restful interfaces are defined for the following resources: product category, product source, body location, and product. TODO - company

In all cases, the content-type of the response will be application/json.

Restful services must be stateless.

[HATEAOS](#) will be used to provide linkable state information in most operations including product search to aid in service navigation. Product search results will provide links to aid UI in pagination.

GET /category

Provides a list of all product categories.

200 OK

```
[{
    "categoryId": 1,
    "categoryName": "Medical",
    "links": [{
        "rel": "self",
        "href": "http://localhost:8080/category/1"
    },
    {
        "rel": "product.search",
        "href": "http://localhost:8080/product?category=1"
    }
    ]
},
{
    "categoryId": 2,
    "categoryName": "Pets and Animals",
    "links": [{
        "rel": "self",
        "href": "http://localhost:8080/category/2"
    },
    {
        "rel": "product.search",
```

```

        "href": "http://localhost:8080/product?category=2"
      }
    ]
  }, .... <edited for brevity>
  {
    "categoryId": 8,
    "categoryName": "Gaming",
    "links": [{
      "rel": "self",
      "href": "http://localhost:8080/category/8"
    },
    {
      "rel": "product.search",
      "href": "http://localhost:8080/product?category=8"
    }
  ]
}
]

```

GET /category/<category id>
 Provides a single product category.
 200 OK
 404 NOT FOUND

```

{
  "categoryId": 4,
  "categoryName": "Entertainment",
  "links": [{
    "rel": "self",
    "href": "http://localhost:8080/category/4"
  },
  {
    "rel": "product.search",
    "href": "http://localhost:8080/product?category=4"
  }
]
}

```

GET /product/<product id>
 Provides a single product.
 200 OK
 400 NOT FOUND

```

{
  "productId": 335,

```

```

    "productName": "Monoprice MHD Sport WiFi Action Camera ...",
    "productPrice": 226.99,
    "companyId": 128,
    "productCategory": {
        "categoryId": 4,
        "categoryName": "Entertainment"
    },
    "bodyLocation": {
        "bodyLocationId": 9,
        "bodyLocationName": "Head"
    },
    "productSource": {
        "sourceId": 2,
        "sourceName": "Google Results"
    }
}

```

GET /product?name=xxx&page=p&limit=n&category=c&body-location=b&source=s
 Product search by any or all of search filters listed above. “name” search filter supports wildcards by using ‘*’.
 200 OK - empty list is possible

Example request:

<http://localhost:8080/product?name=Activity%20Tracker&category=6&limit=3>

```

{
    "page": 0,
    "limit": 3,
    "numberOfProducts": 8,
    "links": [{
        "rel": "self",
        "href":
"http://localhost:8080/product?name=Activity%20Tracker&category=6&limit=3"
    },
    {
        "rel": "first",
        "href":
"http://localhost:8080/product?name=Activity%20Tracker&category=6&limit=3&page=0"
    },
    {
        "rel": "next",
        "href":
"http://localhost:8080/product?name=Activity%20Tracker&category=6&limit=3&page=1"
    },
    {
        "rel": "last",

```

```

        "href":
"http://localhost:8080/product?name=Activity%20Tracker&category=6&limit=3&page=1"
    },
    ],
    "products": [{
        "productId": 407,
        "productName": "Polar Loop Activity Tracker Fitness Band Black Bundle
90053552",
        "productPrice": 159.95,
        "companyId": 30,
        "productCategory": {
            "categoryId": 6,
            "categoryName": "Fitness"
        },
        "bodyLocation": {
            "bodyLocationId": 8,
            "bodyLocationName": "Wrist"
        },
        "productSource": {
            "sourceId": 2,
            "sourceName": "Google Results"
        },
        "links": [{
            "rel": "self",
            "href": "http://localhost:8080/product/407"
        }]
    },
    {
        "productId": 30,
        "productName": "Misfit Wearables Topaz Shine Activity Tracker -
SH0GZ",
        "productPrice": 99.99,
        "companyId": 99,
        "productCategory": {
            "categoryId": 6,
            "categoryName": "Fitness"
        },
        "bodyLocation": {
            "bodyLocationId": 8,
            "bodyLocationName": "Wrist"
        },
        "productSource": {
            "sourceId": 2,
            "sourceName": "Google Results"
        },
    },

```

```

        "links": [{
            "rel": "self",
            "href": "http://localhost:8080/product/30"
        }]
    },
    {
        "productId": 375,
        "productName": "Polar - Loop Activity Tracker - Purple",
        "productPrice": 77.95,
        "companyId": 30,
        "productCategory": {
            "categoryId": 6,
            "categoryName": "Fitness"
        },
        "bodyLocation": {
            "bodyLocationId": 8,
            "bodyLocationName": "Wrist"
        },
        "productSource": {
            "sourceId": 2,
            "sourceName": "Google Results"
        },
        "links": [{
            "rel": "self",
            "href": "http://localhost:8080/product/375"
        }]
    }
]
}

```

GET /body-location

Provides all body locations.

200 OK

Implemented - skipping example for brevity, but it will look similar to the above layout.

GET /body-location/<body location id>

Provides a single body location.

200 OK

404 NOT FOUND

Implemented - skipping example for brevity, but it will look similar to the above layout.

GET /source

Provides all product sources.

200 OK

Not yet implemented.

GET /source/<source id>
Provides a single product source.
200 OK
404 NOT FOUND
Not yet implemented.

GET /company
Provides all companies.
200 OK
Not yet implemented.

GET /company/<company id>
Provides a single company.
200 OK
404 NOT FOUND
Not yet implemented.

7. Detailed Design

Backend services as described above in Interfaces section.

See schema.sql file for normalized database schema.

8. Deployment and Configuration

Prepared to talk about deployment strategies and unimplemented features.