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TECHNOLOGY, TIRUTTANI - 631209**

Approved by AICTE, New Delhi Affiliated to Anna University, Chennai

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**



## **IMAGE RECOGNITION WITH IBM CLOUD VISUAL RECOGNITION**

### **PROJECT REPORT**

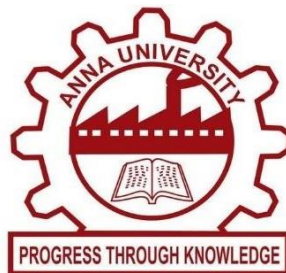
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### **BONAFIDE CERTIFICATE**

Certified that this project report “ **IMAGE RECOGNITION WITH IBM CLOUD VISUAL RECOGNITION**” is the bonafide work of “**SUNITHA.S [110321104050]**”

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## TABLE OF CONTENTS

01.	1. CREATING AN IMAGE RECOGNITION PLATFORM: BRIDGING THE GAP BETWEEN PHOTOGRAPHY AND AI-GENERATED NARRATIVES  1.1 ABSTRACT 1.2 INTRODUCTION 1.3 PROJECT DEFINITION	5-7
02.	2. PROJECT DESIGNING AND THINKING  2.1 DESIGNING 2.2 ALGORITHM 2.3 DATASET	8-9
03	3. SUMMARY CODE  3.1 CODE  3.1.1 DOCKERFILE 3.1.2 PACKAGE.JSON 3.1.3 SERVER.JS 3.1.4 DOCKERFILE  3.2 CODE (CODE ENGINE IMAGE CLASSIFICATION) 3.3 SAMPLE OUTPUT	10-55
04	4. CONCLUSION	56

## Creating an Image Recognition Platform: Bridging the Gap Between Photography and AI-Generated Narratives

### Abstract:

In today's digital era, visual content plays a paramount role in communication and storytelling. The ability to capture attention, evoke emotions, and convey complex narratives through images is a skill sought after by photographers, content creators, and marketing professionals alike. As technology continues to advance, image recognition systems powered by artificial intelligence (AI) have emerged as valuable tools for enhancing visual storytelling. This project, titled "Image Recognition," embarks on a journey to leverage the capabilities of IBM Cloud Visual Recognition to create an innovative platform that redefines the way we interact with images. Through this platform, users will be able to upload images and witness the magic of AI as it accurately classifies and describes image contents. AI-generated captions will serve as a crucial element of this platform, empowering users to craft compelling visual narratives that resonate with their audience on a deeper level.

### Introduction:

Photographs have always held the power to capture moments, emotions, and stories. With the advent of digital photography and social media, images have become a universal language, transcending cultural barriers and allowing individuals and businesses to communicate and connect visually. However, in a world flooded with images, the challenge lies in standing out and delivering a message effectively.

Image recognition technology, driven by artificial intelligence and machine learning, has emerged as a game-changer in the realm of visual communication. It enables the automatic identification and classification of objects, scenes, and concepts within images, opening up a world of possibilities for photographers, marketers, and content creators. By harnessing the potential of IBM Cloud Visual Recognition, this project aims to create a platform that not only simplifies image recognition but also enriches visual storytelling.

Certainly, here's a detailed project definition for the "Image Recognition" project, presented in a point-wise and easily understandable format:

### Project Definition:

#### 1. Project Overview

- **Objective:** To create an image recognition system using IBM Cloud Visual Recognition that empowers users to seamlessly upload images, have them accurately classified and described by AI, and utilize AI-generated captions to craft compelling visual narratives.

- **Significance:** In an increasingly visual world, this project bridges the gap between technology and storytelling, enhancing the ability of creators to engage their audience through captivating visuals and narratives.

## 2. Key Objectives

**Image Recognition:** Develop an automated system that accurately identifies and categorizes the content within uploaded images, including objects, scenes, concepts, and context. **AI-Generated Captions:** Integrate natural language generation to automatically generate emotionally resonant and contextually relevant captions for recognized images. **User Interface:** Design an intuitive and user-friendly interface that simplifies the image upload process and allows users to seamlessly access AI-generated captions.

- **User Engagement:** Implement features that enable users to explore, save, share, and organize their AI-enhanced images and narratives.
- **Technical Implementation:** Set up and integrate IBM Cloud Visual Recognition, optimize image classification models, and create an efficient caption generation pipeline.

## 3. Design Thinking Process

- **Problem Definition:** The project aims to address the challenge of enhancing visual storytelling through AI-driven image recognition and caption generation.
- **User-Centric Approach:** The design thinking process emphasizes user needs, usability, and engagement throughout the project.
- **Iterative Design:** The design phase includes continuous iteration based on user feedback and usability testing.

## 4. Technical Implementation

### Image Recognition Setup:

- Create IBM Cloud Visual Recognition service instance.
- Obtain API keys and credentials.
- Ensure secure and efficient integration with the system.

### User Interface Design:

- Develop wireframes and mockups.
- Implement user guidance and visual cues.
- Prioritize an intuitive, accessible, and aesthetically pleasing design.

### Image Classification:

- Choose appropriate pre-trained models.
- Implement image preprocessing for optimal recognition.
- Continuously monitor and optimize model performance metrics.

### **AI-Generated Captions:**

- Select and train language models.
- Implement sentiment analysis and content summarization.
- Ensure context-aware caption generation.

### **User Engagement Features:**

- Enable social media sharing of AI-enhanced images and narratives.
- Create customizable image galleries for users to organize and showcase their work.
- Implement personalized storytelling tools for users to craft compelling narratives.
- Incorporate user interaction analytics to provide insights and improvements.

## **5. User Engagement and Impact**

- **Enhanced Storytelling:** AI-generated captions add depth and emotion to visual content, enabling creators to convey their message effectively and engage their audience on a profound level.
- **Accessibility:** The user-friendly interface and intuitive design make advanced AI technology accessible to users of all skill levels, democratizing the creation of impactful visual stories.
- **Community Building:** Features like social sharing and personalized storytelling foster user interaction, encouraging the growth of a vibrant community of content creators and enthusiasts.
- **Art and Technology Fusion:** The project embodies the fusion of art and technology, providing a platform where the creative potential of both can be fully realized.

## **6. Scope and Deliverables**

- **Phase 1:** Problem definition, design thinking, and technical setup.
- **Phase 2:** User interface design, image recognition implementation, and initial user engagement features.
- **Phase 3:** Integration of AI-generated captions, advanced user engagement features, and iterative refinement.
- **Deliverables:** A fully functional Image Recognition platform, including documentation, user guides, and a user engagement strategy.

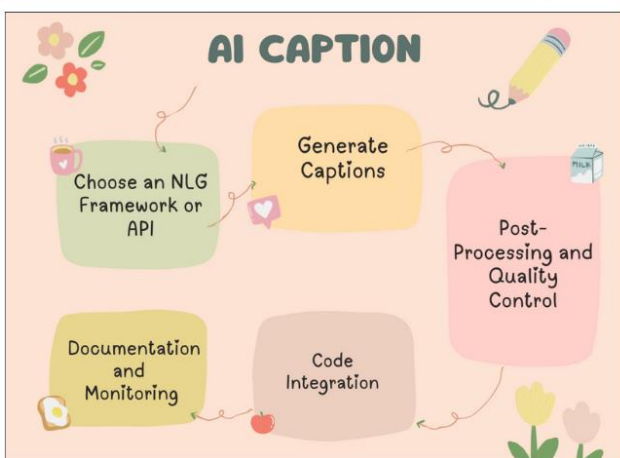
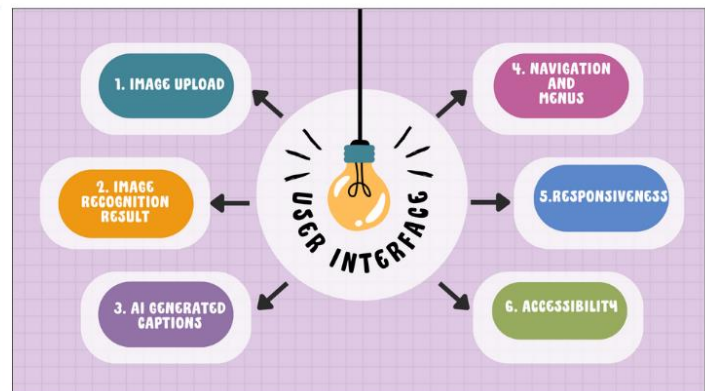
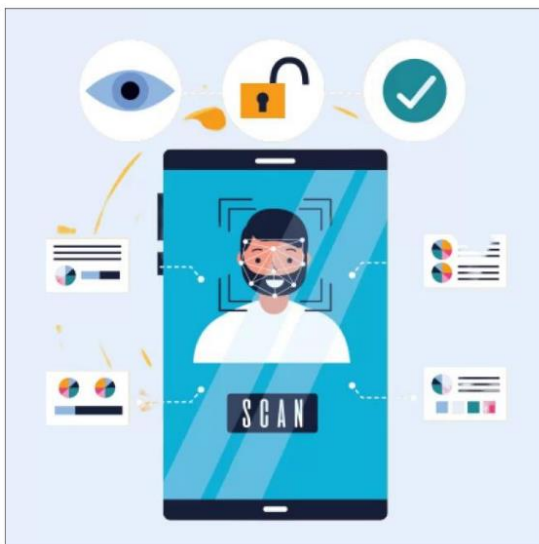
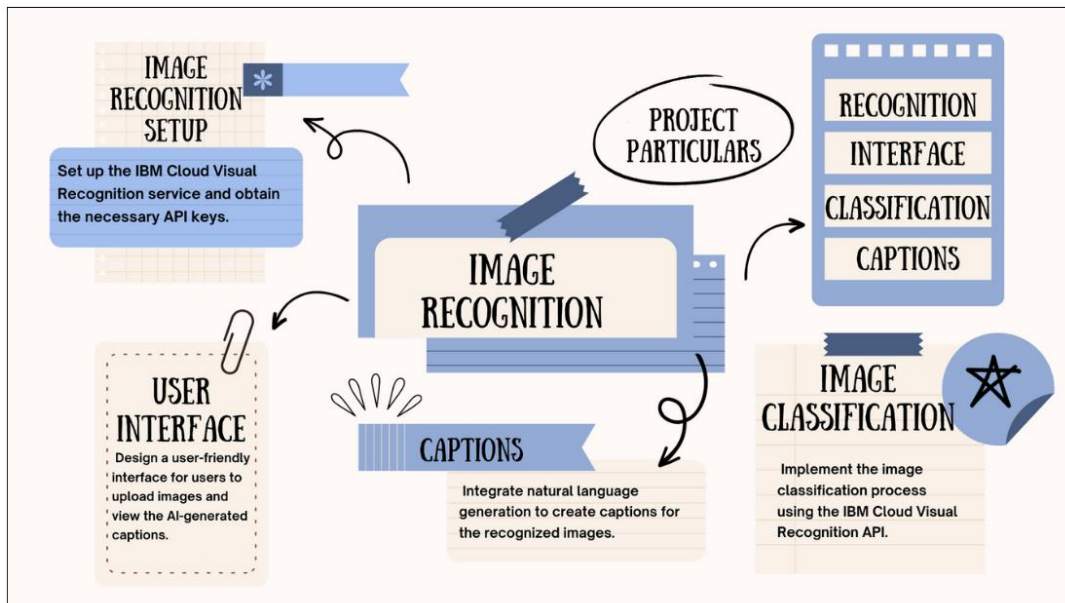
## **7. Project Risks and Mitigations**

**Technical Challenges:** Regular communication and collaboration among team members and the use of agile development practices to address technical hurdles.

**User Adoption:** User testing and feedback collection to ensure the platform aligns with user expectations.

**Data Security:** Implementation of robust security measures to protect user data and maintain compliance with data privacy regulations.

## PROJECT DESIGNING AND THINKING





## **ALGORITHM**

### **1. Image recognition configuration:**

#### **1. Register for an IBM Cloud account:**

Sign up for an IBM Cloud account, which serves as a basis for accessing cloud-based services.

#### **2. Create an instance of the IBM Cloud Image Recognition service:**

Configure a dedicated instance of the image recognition service, creating a space where image data will be processed.

#### **3. Get API key and credentials:**

API keys and secure credentials are provided by IBM Cloud to authenticate and authorize your application to access the Image Recognition service.

#### **4. Store API keys securely:**

Secure API keys and credentials to protect against unauthorized access to your services and data.

## **DATASET:**

<https://www.kaggle.com/datasets/msambare/fer2013>

<https://www.kaggle.com/datasets/deadskull7/fer2013>

<https://github.com/microsoft/FERPlus>

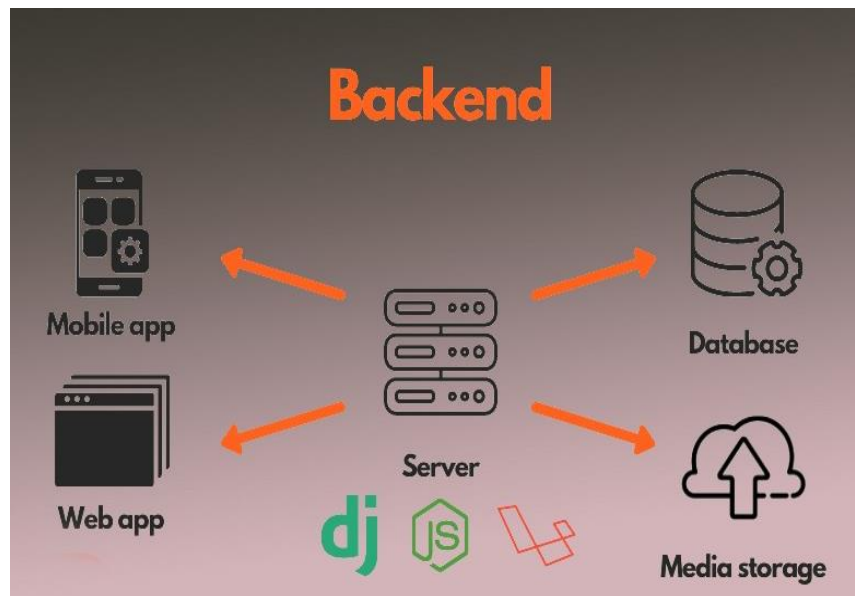
<https://www.kaggle.com/datasets/shawon10/ckplus>

## SUMMARY CODE

### Code:

### DOCKERFILE:

```
FROM node:10-alpine
WORKDIR /usr/src/app
COPY package*.json ./
RUN npm install
RUN npm ci --only=production
COPY . .
EXPOSE 3001
CMD [ "node", "server.js" ]
```



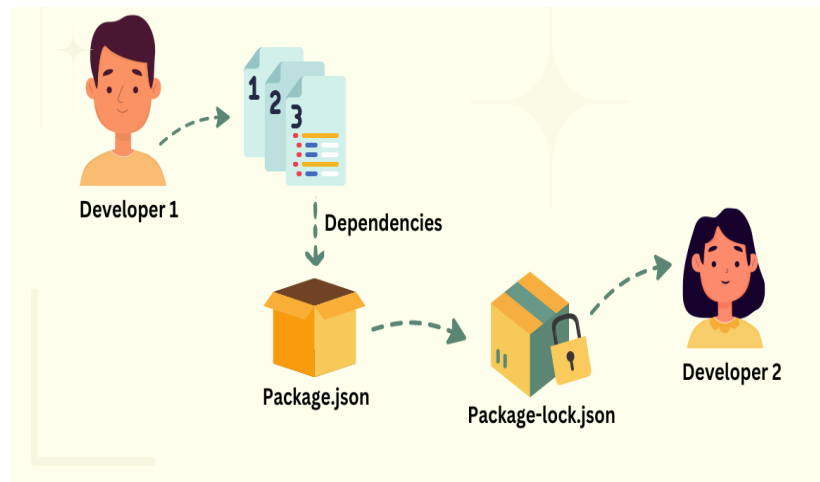
### PACKAGE.JSON:

```
{
  "name": "codeengine-image-classification-backend",
  "version": "1.0.0",
  "description": "Backend server for Code Engine Image Classification",
  "main": "server.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
}
```

```

"author": "Vidyasagar Machupalli",
"license": "ISC",
"dependencies": {
  "cors": "^2.8.5",
  "dotenv": "^8.2.0",
  "express": "^4.17.1",
  "ibm-cos-sdk": "^1.6.0",
  "multer": "^1.4.2",
  "multer-s3": "^2.9.0"
}
}

```



### **SERVER.JS:**

```

"use strict";
const myCOS = require("ibm-cos-sdk");
const multer = require("multer");
const multerS3 = require("multer-s3");
const express = require("express");
const app = express();
const path = require("path");
require("dotenv").config({
  silent: true
});

const cors = require("cors");
app.use(cors());

const port = process.env.PORT || 3001;

function getCosClient() {

```

```

var config = {
  endpoint:
    process.env.COS_ENDPOINT ||
    "s3.us-south.cloud-object-storage.appdomain.cloud",
  apiKeyId: process.env.COS_APIKEY,
  ibmAuthEndpoint: "https://iam.cloud.ibm.com/identity/token",
  serviceInstanceId: process.env.COS_RESOURCE_INSTANCE_ID,
};

var cosClient = new myCOS.S3(config);
return cosClient;
}

function uploadFilesToCOS(req, res, next) {
  var upload = multer({
    storage: multerS3({
      s3: getCosClient(),
      bucket: process.env.COS_BUCKETNAME + "/images",
      metadata: function (req, file, cb) {
        cb(null, { fieldName: file.fieldname });
      },
      key: function (req, file, cb) {
        cb(null, file.originalname);
      }
    }),
  }).array("files", 10);

  upload(req, res, function (err) {
    if (err) {
      return next(err);
    }
    if (req.files.length === 0) {
      return res.send("Upload an image...");
    } else if (req.files.length > 1) {
      return res.send(
        "Successfully uploaded " + req.files.length + " images to Object Storage");
    } else {
      return res.send(
        "Successfully uploaded " + req.files.length + " image to Object Storage");
    }
  });
}

async function getBucketContents(req, res, next, prefix) {
  try {
    let cos = getCosClient();
    let bucketName = process.env.COS_BUCKETNAME;

```

```

var resultDict = {};
var result;
console.log(`Retrieving bucket contents from: ${bucketName}`);

const data = await cos
  .listObjects({
    Bucket: bucketName,
    Prefix: prefix,
  })
  .promise();
if (data !== null && data.Contents !== null) {
  for (var i = 0; i < data.Contents.length; i++) {
    var itemKey = data.Contents[i].Key;
    var itemSize = data.Contents[i].Size;
    console.log(`Item: ${itemKey} (${itemSize} bytes).`);
    result = await getItem(bucketName, itemKey, prefix);
    resultDict[itemKey] = result;
  }
  res.send(resultDict);
}
} catch (e) {
  console.error(`ERROR: ${e.code} - ${e.message}\n`);
  return next(e.message);
}
}

async function getItem(bucketName, itemName, prefix) {
  let cos = getCosClient();
  console.log(`Retrieving item from bucket: ${bucketName}, key: ${itemName}`);
  try {
    const data = await cos
      .getObject({
        Bucket: bucketName,
        Key: itemName,
      })
      .promise();
    if (data !== null) {
      if (prefix === "results") {
        return JSON.parse(data.Body);
      } else {
        return Buffer.from(data.Body).toString("base64");
      }
    }
  } catch (e) {
    console.error(`ERROR: ${e.code} - ${e.message}\n`);
  }
}

async function deleteItem(req, res, next, bucketName, itemName, prefix) {
  let cos = getCosClient();
  let bucketname = process.env.COS_BUCKETNAME;

```

```

itemName = prefix + "/" + itemName;
if (prefix === "results") {
  itemName = itemName + ".json";
}
console.log(`Deleting item: ${itemName}`);
try {
  await cos
    .deleteObject({
      Bucket: bucketname,
      Key: itemName,
    })
    .promise();
  console.log(`Item: ${itemName} deleted!`);
  res.send(`Item: ${itemName} deleted!`);
} catch (e) {
  console.error(`ERROR: ${e.code} - ${e.message}\n`);
}

app.get("/", function (req, res, next) {
  res.send("Hello World! from backend");
});

app.get("/items", async (req, res, next) => {
  try {
    var prefix = req.query.prefix;

    await getBucketContents(req, res, next, prefix);
  } catch (error) {

    return next(error);
  }
});

app.post("/images", uploadFilesToCOS, function (req, res, next) { });

app.post("/results", async (req, res, next) => {
  try {
    await getBucketContents(req, res, next, "results");
  } catch (error) {
    console.log(error);
    return next(error);
  }
});

app.delete("/item", async (req, res, next) => {
  var itemName = req.query.filename;

```

```

console.log(itemName);
await deleteItem(req, res, next, null, itemName, "images");
await deleteItem(req, res, next, null, itemName, "results");
});

app.use((req, res, next) => {
  const error = new Error("Not found");
  error.status = 404;
  next(error);
});
app.use((error, req, res, next) => {
  console.log(error);
  if (res.headersSent) {
    return next(error);
  }
  res.status(error.status || 500).send({
    error: {
      status: error.status || 500,
      message: error.message || "Internal Server error",
    },
  });
});

app.listen(port, () => console.log(`App listening on port ${port}!`));

```



### **DOCKERFILE:**

```
FROM node:10-alpine
WORKDIR /usr/src/app
```

```
COPY package*.json ./
RUN npm install
RUN npm ci --only=production
COPY . .
EXPOSE 3000
CMD [ "node", "app.js" ]
```

APP.JS:

```
"use strict";
const express = require("express");
const app = express();
const request = require("request");
const path = require("path");
require("dotenv").config({
  silent: true
});
const cors = require("cors");
app.use(cors());
app.use(express.static(__dirname + '/public/js'));
app.use(express.static(__dirname + '/public/images'))
app.use(express.static(__dirname + '/public/css'))
const port = process.env.PORT || 3000;

const backendURL = process.env.BACKEND_URL;
console.log("backend URL: " + backendURL);

app.get('/', function(req, res) {
  if (backendURL === undefined || backendURL === ""){
    // if user is not logged-in redirect back to login page //
    res.sendFile(__dirname + "/public/501.html");
  } else{
    res.sendFile(__dirname + "/public/index.html");
  }
});

app.get('/items', async(req, res) => {
  req.pipe(
    await request.get(
      {
        url: backendURL+"/items?prefix=images",
        agentOptions: {
          rejectUnauthorized: false
        }
      }
    )
  )
})
```



```

    }
  },
  function(error, resp, body) {
    if (error) {
      res.status(400).send(error.message);
    }
    else{
      //console.log(body);
      res.send({ data: body });
    }
  }
)
);
});
app.post("/uploadimage", async(req, res) => {
  req.pipe(
    await request.post(
      {
        url: backendURL+"/images",
        gzip: true,
        agentOptions: {
          rejectUnauthorized: false
        }
      },
      function(error, resp, body) {
        if (error) {
          console.log(error);
          res.status(400).send(error.message);
        }
        else{
          //console.log(body);
          res.send({ data: body });
        }
      })
    );
  });

app.post("/classifyimage", async(req, res) => {
  req.pipe(
    await request.post(
      {
        url: backendURL+"/results",
        agentOptions: {
          rejectUnauthorized: false
        }
      },
      function(error, resp, body) {

```

```

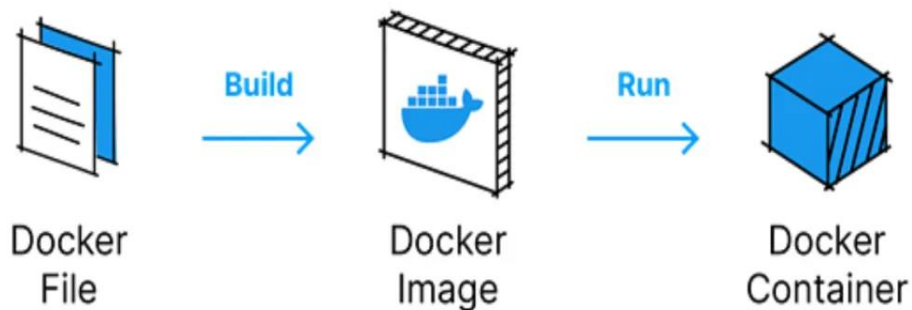
    if (error) {
      console.log(error);
      res.status(400).send(error.message);
    }
    else{
      //console.log(body);
      res.send({ data: body });
    })
  );
});

app.delete("/image", async (req, res) => {
  var itemName = req.query.filename;
  req.pipe(
    await request.delete(
      {
        url: backendURL+"/item?filename="+itemName,
        agentOptions: {
          rejectUnauthorized: false
        }
      },
      function(error, resp, body) {
        if (error) {
          console.log(error);
          res.status(400).send(error.message);
        }
        else{
          //console.log(body);
          res.send({ data: body });
        }}});
});

app.use(function(error, req, res, next) {
  res.status(500).send(error.message);
});

app.listen(port, () => console.log(`App listening on port ${port}!`));

```



**CODE (code engine image classification) :**

```

{
  "name": "codeengine-image-classification-backend",
  "version": "1.0.0",
  "lockfileVersion": 1,
  "requires": true,
  "dependencies": {
    "accepts": {
      "version": "1.3.7",
      "resolved": "https://registry.npmjs.org/accepts/-/accepts-1.3.7.tgz",
      "integrity": "sha512-I80Qs2WjY1JIBNzNkK6KYq1VMTbZLXgHx2oT0pU/fjRHyEp+PEfEPY0R3WCwAGVOtauxh1hOxNgIf5bv7dQpA==",
      "requires": {
        "mime-types": "~2.1.24",
        "negotiator": "0.6.2"
      }
    },
    "append-field": {
      "version": "1.0.0",
      "resolved": "https://registry.npmjs.org/append-field/-/append-field-1.0.0.tgz",
      "integrity": "sha1-HjRA6RXwsSA9I3SOeO3XubW0PIY="
    },
    "array-flatten": {
      "version": "1.1.1",
      "resolved": "https://registry.npmjs.org/array-flatten/-/array-flatten-1.1.1.tgz",
      "integrity": "sha1-lml9pkFGx5wczKPKgCJaLZOopVdI="
    },
    "asn1.js": {
      "version": "4.10.1",

```

```

    "resolved": "https://registry.npmjs.org/asn1.js/-/asn1.js-4.10.1.tgz",
    "integrity": "sha512-p32cOF5q0Zqs9uBiONKYLm6BClCoBCM5O9JfeUSlnQLBTxYdTK+pW+nXflm8UkKd2UYIEbYz5qEi0JuZR9ckSw==",
    "requires": {
      "bn.js": "^4.0.0",
      "inherits": "^2.0.1",
      "minimalistic-assert": "^1.0.0"
    }
  },
  "base64-js": {
    "version": "1.3.1",
    "resolved": "https://registry.npmjs.org/base64-js/-/base64-js-1.3.1.tgz",
    "integrity": "sha512-mLQ4i2QO1ytvGWFwmcngKO//JXAQvZvwEKtjgQFM4jIK0kU+ytMfplL8j+n5mspOfjHwoAg+9yhb7BwAHm36g==",
    },
  "bn.js": {
    "version": "4.11.8",
    "resolved": "https://registry.npmjs.org/bn.js/-/bn.js-4.11.8.tgz",
    "integrity": "sha512-ItfYfPLkWHUjckQCk8xC+LwxgK8NYcXywGigJgSwOP8Y2iyWT4f2vsZnoOXTTbo+o5yXmIUJ4gn5538SO5S3gA==",
    },
  "body-parser": {
    "version": "1.19.0",
    "resolved": "https://registry.npmjs.org/body-parser/-/body-parser-1.19.0.tgz",
    "integrity": "sha512-dhEPs72UPbDnAQJ9ZKMNTp6ptJaionhP5cBb541nXPIW60Jepo9RV/a4fX4XWW9CuFNK22krhj1+rgzifNCsw==",
    "requires": {
      "bytes": "3.1.0",
      "content-type": "~1.0.4",

```

```

    "debug": "2.6.9",
    "depd": "~1.1.2",
    "http-errors": "1.7.2",
    "iconv-lite": "0.4.24",
    "on-finished": "~2.3.0",
    "qs": "6.7.0",
    "raw-body": "2.4.0",
    "type-is": "~1.6.17"
  }
},
"brorand": {
  "version": "1.1.0",
  "resolved": "https://registry.npmjs.org/brorand/-/brorand-1.1.0.tgz",
  "integrity": "sha1-EsJe/kCkXjwyPrhnWgoM5XsiNx8="
},
"browserify-aes": {
  "version": "1.2.0",
  "resolved": "https://registry.npmjs.org/browserify-aes/-/browserify-aes-1.2.0.tgz",
  "integrity": "sha512-b6XpdtO9Q+DxWY+T5KIDjG6hVQwtPp94T5jJHuz9k3XoXsXZvT9j4UwX9XNq3u31K1dYvW3DkGZZNpU="
},
"requires": {
  "buffer-xor": "^1.0.3",
  "cipher-base": "^1.0.0",
  "create-hash": "^1.1.0",
  "evp_bytestokey": "^1.0.3",
  "inherits": "^2.0.1",
  "safe-buffer": "^5.0.1"
}
},

```

```

"browserify-cipher": {
  "version": "1.0.1",
  "resolved": "https://registry.npmjs.org/browserify-cipher/-/browserify-cipher-1.0.1.tgz",
  "integrity": "sha512-sPhkz0ARKbf4rRQt2hTpAHqn47X3lLkUGn+xEJzLjwY8LRs2p0v7ljvI5EyoRO/mexrNunNECisZs+gw2zz1w==",
  "requires": {
    "browserify-aes": "^1.0.4",
    "browserify-des": "^1.0.0",
    "evp_bytestokey": "^1.0.0"
  }
},
"browserify-des": {
  "version": "1.0.2",
  "resolved": "https://registry.npmjs.org/browserify-des/-/browserify-des-1.0.2.tgz",
  "integrity": "sha512-8XyL1ehVyF/QlevP0z4lx4p+OwYX48uDbp5412/7x1lVxbN57Jn3NgvBS1G2201Qq6lS7u1y7Po3Dq7nQQ==",
  "requires": {
    "cipher-base": "^1.0.1",
    "des.js": "^1.0.0",
    "inherits": "^2.0.1",
    "safe-buffer": "^5.1.2"
  }
},
"browserify-rsa": {
  "version": "4.0.1",
  "resolved": "https://registry.npmjs.org/browserify-rsa/-/browserify-rsa-4.0.1.tgz",
  "integrity": "sha1-IeCr+vbyApzy+vsTNWenAdQTVSQ=",
  "requires": {
    "bn.js": "^4.1.0",

```

```

    "randombytes": "^2.0.1"
  }
},
"browserify-sign": {
  "version": "4.0.4",
  "resolved": "https://registry.npmjs.org/browserify-sign/-/browserify-sign-4.0.4.tgz",
  "integrity": "sha1-qk62jl17ZYuqa/alfmMMvXqT0pg=",
  "requires": {
    "bn.js": "^4.1.1",
    "browserify-rsa": "^4.0.0",
    "create-hash": "^1.1.0",
    "create-hmac": "^1.1.2",
    "elliptic": "^6.0.0",
    "inherits": "^2.0.1",
    "parse-asn1": "^5.0.0"
  }
},
"buffer": {
  "version": "4.9.2",
  "resolved": "https://registry.npmjs.org/buffer/-/buffer-4.9.2.tgz",
  "integrity": "sha512-xq+q3SRMOxGivLhBNaUdC64hDTQwejJ+H0T/NB1XMtTVEwNTrfFF3gAxiyW0Bu/xWEGhjVKgUcMhCrUy2+uCWg==",
  "requires": {
    "base64-js": "^1.0.2",
    "ieee754": "^1.1.4",
    "isarray": "^1.0.0"
  },
  "dependencies": {
    "isarray": {

```

```

    "version": "1.0.0",
    "resolved": "https://registry.npmjs.org/isarray/-/isarray-1.0.0.tgz",
    "integrity": "sha1-u5NdSFgsuhaMBoNJV6VKPgcSTxE="
  }
},
"buffer-from": {
  "version": "1.1.1",
  "resolved": "https://registry.npmjs.org/buffer-from/-/buffer-from-1.1.1.tgz",
  "integrity": "sha512-MQcXEUBcKtEo7bhqEs6560Hyd4XaovZlO/k9V3hjVUF/zwW7KBVdSK4gIt/bzwS9MbR5qob+F5jusZsb0YQK2A=="
},
"buffer-xor": {
  "version": "1.0.3",
  "resolved": "https://registry.npmjs.org/buffer-xor/-/buffer-xor-1.0.3.tgz",
  "integrity": "sha1-JuYe0UIvtw3ULm42cp7VHYVf6Nk="
},
"busboy": {
  "version": "0.2.14",
  "resolved": "https://registry.npmjs.org/busboy/-/busboy-0.2.14.tgz",
  "integrity": "sha1-bCpiLvz0fFe7vh4qnDetNseSVFM=",
  "requires": {
    "dicer": "0.2.5",
    "readable-stream": "1.1.x"
  }
},
"bytes": {
  "version": "3.1.0",
  "resolved": "https://registry.npmjs.org/bytes/-/bytes-3.1.0.tgz",

```



```

    "integrity": "sha512-
zauLjrfCG+xvoyaqLoV8bLVXXNGC4JqlxFCutSDWA6fJrTo2ZuvLYTqZ7aHBLZSMOopbwv8f+wZc
VzfVTI2Dg=="
  },
  "cipher-base": {
    "version": "1.0.4",
    "resolved": "https://registry.npmjs.org/cipher-base/-/cipher-base-1.0.4.tgz",
    "integrity": "sha512-
Kkht5ye6ZGmwv40uUDZztayT2ThLQGfnj/T71N/XzeZeo3nf8foyW7zGTsPYkEya3m5f3cAypH+qe7YO
rM1U2Q==",
    "requires": {
      "inherits": "^2.0.1",
      "safe-buffer": ^5.0.1"
    }
  },
  "concat-stream": {
    "version": "1.6.2",
    "resolved": "https://registry.npmjs.org/concat-stream/-/concat-stream-1.6.2.tgz",
    "integrity": "sha512-
27HBghJxjiZtIk3Ycvn/4kbJk/1uZuJFfuPEns6LaEvvpG1f0hTea8lilrouyo9mVc2GWdcEZ8OLoGmSADlr
Cw==",
    "requires": {
      "buffer-from": ^1.0.0",
      "inherits": ^2.0.3",
      "readable-stream": ^2.2.2",
      "typedarray": ^0.0.6"
    }
  },
  "dependencies": {
    "isarray": {
      "version": "1.0.0",
      "resolved": "https://registry.npmjs.org/isarray/-/isarray-1.0.0.tgz",
      "integrity": "sha1-u5NdSFgsuhaMBoNJV6VKPgcSTxE="
    }
  }

```

```

    },
    "readable-stream": {
      "version": "2.3.7",
      "resolved": "https://registry.npmjs.org/readable-stream/-/readable-stream-2.3.7.tgz",
      "integrity": "sha512-Ebho8K4jIbHAXnuxi7o42OrZgF/ZTNcsZj6nRKYUmkhLFq8CHItp/fy6hQZuZmP/n3yZ9VBUp4zz/mX8hmYPw==",
      "requires": {
        "core-util-is": "~1.0.0",
        "inherits": "~2.0.3",
        "isarray": "~1.0.0",
        "process-nextick-args": "~2.0.0",
        "safe-buffer": "~5.1.1",
        "string_decoder": "~1.1.1",
        "util-deprecate": "~1.0.1"
      }
    },
    "string_decoder": {
      "version": "1.1.1",
      "resolved": "https://registry.npmjs.org/string_decoder/-/string_decoder-1.1.1.tgz",
      "integrity": "sha512-n/ShnvDi6FHbbVfviro+WojiFzv+s8MPMHBczVePfUpDJLwoLT0ht1l4YwBCbi8pJAveEEdnkHyPyTP/mzRfwg==",
      "requires": {
        "safe-buffer": "~5.1.0"
      }
    }
  },
  "content-disposition": {
    "version": "0.5.3",

```

```

    "resolved": "https://registry.npmjs.org/content-disposition/-/content-disposition-0.5.3.tgz",
    "integrity": "sha512-ExO0774ikEObIAEV9kDo50o+79VCUdEB6n6lzKgGwupcVeRlhrj3qGAfwq8G6uBJjkqLrhT0qEYFcWn
g8z1z0g==",
    "requires": {
      "safe-buffer": "5.1.2"
    },
    "content-type": {
      "version": "1.0.4",
      "resolved": "https://registry.npmjs.org/content-type/-/content-type-1.0.4.tgz",
      "integrity": "sha512-hIP3EEPs8tB9AT1L+NUqtwOApis4mk2Zob89MWXMhJHWg9milF/j4osnnQLXBCBFBk/tvIG/tUc9mO
UJiPBhPXA=="
    },
    "cookie": {
      "version": "0.4.0",
      "resolved": "https://registry.npmjs.org/cookie/-/cookie-0.4.0.tgz",
      "integrity": "sha512-+Hp8fLp57wnUSt0tY0tHEXh4voZRDnoIrZPqlo3DPiI4y9lwG/jqx+1Om94/W6ZaPDOUbnjOt/99w66zk+l
1Xg=="
    },
    "cookie-signature": {
      "version": "1.0.6",
      "resolved": "https://registry.npmjs.org/cookie-signature/-/cookie-signature-1.0.6.tgz",
      "integrity": "sha1-4wOogrNCzD7oylE6eZmXNNqzriw="
    },
    "core-util-is": {
      "version": "1.0.2",
      "resolved": "https://registry.npmjs.org/core-util-is/-/core-util-is-1.0.2.tgz",
      "integrity": "sha1-tf1UIgqivFq1eqtxQMIAdUUDwac="
    },

```

```

"cors": {
  "version": "2.8.5",
  "resolved": "https://registry.npmjs.org/cors/-/cors-2.8.5.tgz",
  "integrity": "sha512-KIHbLJqu73RGr/hnbrO9uBeixNGuvSQjul/jdFvS/KFSIH1hWVd1ng7zOHx+YrEfInLG7q4n6GHQ9cDtx
v/P6g==",
  "requires": {
    "object-assign": "^4",
    "vary": "^1"
  }
},
"create-ecdh": {
  "version": "4.0.3",
  "resolved": "https://registry.npmjs.org/create-ecdh/-/create-ecdh-4.0.3.tgz",
  "integrity": "sha512-GbEHQPMOswGpKXM9kCWVrremUcBmjteUaQ01T9rkKCPDXfUHX0IoP9LpHYo2NPFampa4e+/pFD
c3jQdxrxQLaw==",
  "requires": {
    "bn.js": "^4.1.0",
    "elliptic": "^6.0.0"
  }
},
"create-hash": {
  "version": "1.2.0",
  "resolved": "https://registry.npmjs.org/create-hash/-/create-hash-1.2.0.tgz",
  "integrity": "sha512-z00bCGNHDG8mHAKP7CtT1qVu+bFQUPjYq/4Iv3C3kWjTFV10zIjfSoeqXo9Asws8gwSHDGj/hl2u4O
GIjapeCg==",
  "requires": {
    "cipher-base": "^1.0.1",
    "inherits": "^2.0.1",
    "md5.js": "^1.3.4",

```

```

    "ripemd160": "^2.0.1",
    "sha.js": "^2.4.0"
  },
  "create-hmac": {
    "version": "1.1.7",
    "resolved": "https://registry.npmjs.org/create-hmac/-/create-hmac-1.1.7.tgz",
    "integrity": "sha512-MJG9liiZ+ogc4TzUwuvbER1JRdgvUFSB5+VR/g5h82fGaIRWMWddtKBHi7/sVhfjQZ6SehlyhvQYrcYk
aUIpLg==",
    "requires": {
      "cipher-base": "^1.0.3",
      "create-hash": "^1.1.0",
      "inherits": "^2.0.1",
      "ripemd160": "^2.0.0",
      "safe-buffer": "^5.0.1",
      "sha.js": "^2.4.8"
    }
  },
  "crypto-browserify": {
    "version": "3.12.0",
    "resolved": "https://registry.npmjs.org/crypto-browserify/-/crypto-browserify-3.12.0.tgz",
    "integrity": "sha512-fz4splh+znjO2VjL+IdhEpRJ3YN6sMzITSBijk6FK2UvTqruSQW+/cCZTSNsMiZNvUeq0CqurF+dAbyiG
OY6Wg==",
    "requires": {
      "browserify-cipher": "^1.0.0",
      "browserify-sign": "^4.0.0",
      "create-ecdh": "^4.0.0",
      "create-hash": "^1.1.0",
      "create-hmac": "^1.1.0",

```

```

    "diffie-hellman": "^5.0.0",
    "inherits": "^2.0.1",
    "pbkdf2": "^3.0.3",
    "public-encrypt": "^4.0.0",
    "randombytes": "^2.0.0",
    "randomfill": "^1.0.3"
  }
},
"debug": {
  "version": "2.6.9",
  "resolved": "https://registry.npmjs.org/debug/-/debug-2.6.9.tgz",
  "integrity": "sha512-bC7ElrdJaInPbAP+1EotYvqZsb3ecl5wi6Bfi6BJTUcNowp6cvspg0jXznRTKDjm/E7AdgFBVeAPVMNcK
GsHMA==",
  "requires": {
    "ms": "2.0.0"
  }
},
"depd": {
  "version": "1.1.2",
  "resolved": "https://registry.npmjs.org/depd/-/depd-1.1.2.tgz",
  "integrity": "sha1-m81S4UwJd2PnSbJ0xDRu0uVgtak="
},
"des.js": {
  "version": "1.0.1",
  "resolved": "https://registry.npmjs.org/des.js/-/des.js-1.0.1.tgz",
  "integrity": "sha512-Q0I4pfFrv2VPd34/vfLrFOoRmlYj3OV50i7fskps1jZWK1kApMWWT9G6RRUeYedLcBDIhnSDaUvJMb
3AhUlaEA==",
  "requires": {
    "inherits": "^2.0.1",

```

```

    "minimalistic-assert": "^1.0.0"
  }
},
"destroy": {
  "version": "1.0.4",
  "resolved": "https://registry.npmjs.org/destroy/-/destroy-1.0.4.tgz",
  "integrity": "sha1-l4hXRCxEJ5CBmE+N5RiBYJqvYA="
},
"dicer": {
  "version": "0.2.5",
  "resolved": "https://registry.npmjs.org/dicer/-/dicer-0.2.5.tgz",
  "integrity": "sha1-WZbAhRszIYyBLAkL3cCc0S+stw8=",
  "requires": {
    "readable-stream": "1.1.x",
    "streamsearch": "0.1.2"
  }
},
"diffie-hellman": {
  "version": "5.0.3",
  "resolved": "https://registry.npmjs.org/diffie-hellman/-/diffie-hellman-5.0.3.tgz",
  "integrity": "sha512-kqag/Nl+f3GwyK25fhUMYj81BUOrZ9IuJsJlcDE5icNM9FJHAVm3VcUDxdLPoQtTuUylWm6ZIknYJw
waPxsUzg==",
  "requires": {
    "bn.js": "^4.1.0",
    "miller-rabin": "^4.0.0",
    "randombytes": "^2.0.0"
  }
},
"dotenv": {

```

```

    "version": "8.2.0",
    "resolved": "https://registry.npmjs.org/dotenv/-/dotenv-8.2.0.tgz",
    "integrity": "sha512-8sJ78ElpbDJBHNeBzUbUVLsqKdcaa/BXF1uPTw3GrvQTBgrQrtObr2mUrE38vzYd8cEv+m/JBfDLioYcfXoaw=="
  },
  "ee-first": {
    "version": "1.1.1",
    "resolved": "https://registry.npmjs.org/ee-first/-/ee-first-1.1.1.tgz",
    "integrity": "sha1-WQxhFWsK4vTwJVcyoViyZrxWsh0="
  },
  "elliptic": {
    "version": "6.5.2",
    "resolved": "https://registry.npmjs.org/elliptic/-/elliptic-6.5.2.tgz",
    "integrity": "sha512-84E078YFi8y2b7e50D1bq1i2nF0YodvUPhsrDy8bW0kXsGrsTPbEZKJdnYEHz4W0lO8GHy4N5hZ908j05fQ==",
    "requires": {
      "bn.js": "^4.4.0",
      "brorand": "^1.0.1",
      "hash.js": "^1.0.0",
      "hmac-drbg": "^1.0.0",
      "inherits": "^2.0.1",
      "minimalistic-assert": "^1.0.0",
      "minimalistic-crypto-utils": "^1.0.0"
    }
  },
  "encodeurl": {
    "version": "1.0.2",
    "resolved": "https://registry.npmjs.org/encodeurl/-/encodeurl-1.0.2.tgz",
    "integrity": "sha1-rT/0yG7C0CkyL1oCw6mmBslbP1k="
  }

```



```

},
"escape-html": {
  "version": "1.0.3",
  "resolved": "https://registry.npmjs.org/escape-html/-/escape-html-1.0.3.tgz",
  "integrity": "sha1-Aljq5NPQwJdN4cFpGI7wBR0dGYg="
},
"etag": {
  "version": "1.8.1",
  "resolved": "https://registry.npmjs.org/etag/-/etag-1.8.1.tgz",
  "integrity": "sha1-Qa4u62XvpiJorr/qg6x9eSmbCIc="
},
"evp_bytestokey": {
  "version": "1.0.3",
  "resolved": "https://registry.npmjs.org/evp_bytestokey/-/evp_bytestokey-1.0.3.tgz",
  "integrity": "sha512-f2Go4TognH/KvCISP7OUsHn85hT9nUkxxA9BEWxFn+Oj9o8ZNLm/40hdlgSLyuOimsrTKLUMEorQexp/aPQeA==",
  "requires": {
    "md5.js": "^1.3.4",
    "safe-buffer": "^5.1.1"
  }
},
"express": {
  "version": "4.17.1",
  "resolved": "https://registry.npmjs.org/express/-/express-4.17.1.tgz",
  "integrity": "sha512-mHJ9O79RqluphRrcw2X/GTh3k9tVv8YcoyY4Kkh4WDMUYKRZUq0h1o0w2rrrxBqM7VoeUVqgb27xlEMXTnYt4g==",
  "requires": {
    "accepts": "~1.3.7",
    "array-flatten": "1.1.1",

```

```
"body-parser": "1.19.0",  
"content-disposition": "0.5.3",  
"content-type": "~1.0.4",  
"cookie": "0.4.0",  
"cookie-signature": "1.0.6",  
"debug": "2.6.9",  
"depd": "~1.1.2",  
"encodeurl": "~1.0.2",  
"escape-html": "~1.0.3",  
"etag": "~1.8.1",  
"finalhandler": "~1.1.2",  
"fresh": "0.5.2",  
"merge-descriptors": "1.0.1",  
"methods": "~1.1.2",  
"on-finished": "~2.3.0",  
"parseurl": "~1.3.3",  
"path-to-regexp": "0.1.7",  
"proxy-addr": "~2.0.5",  
"qs": "6.7.0",  
"range-parser": "~1.2.1",  
"safe-buffer": "5.1.2",  
"send": "0.17.1",  
"serve-static": "1.14.1",  
"setprototypeof": "1.1.1",  
"statuses": "~1.5.0",  
"type-is": "~1.6.18",  
"utils-merge": "1.0.1",  
"vary": "~1.1.2"  
}  
,
```

```

"file-type": {
  "version": "3.9.0",
  "resolved": "https://registry.npmjs.org/file-type/-/file-type-3.9.0.tgz",
  "integrity": "sha1-JXoHg4TR24CHvESdEH1SpSZyuek=",
},
"finalhandler": {
  "version": "1.1.2",
  "resolved": "https://registry.npmjs.org/finalhandler/-/finalhandler-1.1.2.tgz",
  "integrity": "sha512-aAWwW57uxVNrQZqFXjITpW3sIUQmHGG3qSb9mUah9MgMC4NeWhNOINjXEYq3HjRAvL6arUviZGGJsBg6z0zsWA==",
  "requires": {
    "debug": "2.6.9",
    "encodeurl": "~1.0.2",
    "escape-html": "~1.0.3",
    "on-finished": "~2.3.0",
    "parseurl": "~1.3.3",
    "statuses": "~1.5.0",
    "unpipe": "~1.0.0"
  }
},
"forwarded": {
  "version": "0.1.2",
  "resolved": "https://registry.npmjs.org/forwarded/-/forwarded-0.1.2.tgz",
  "integrity": "sha1-mMI9qxFlZXuMBXPozszZGw/xjIQ=",
},
"fresh": {
  "version": "0.5.2",
  "resolved": "https://registry.npmjs.org/fresh/-/fresh-0.5.2.tgz",
  "integrity": "sha1-PYyt2Q2XZWn6g1qx+OSyOhBWBac="
}

```

```

},
"hash-base": {
  "version": "3.0.4",
  "resolved": "https://registry.npmjs.org/hash-base/-/hash-base-3.0.4.tgz",
  "integrity": "sha1-X8hoaEfs1zSZQDMZprCj8/auSRg=",
  "requires": {
    "inherits": "^2.0.1",
    "safe-buffer": "^5.0.1"
  }
},
"hash.js": {
  "version": "1.1.7",
  "resolved": "https://registry.npmjs.org/hash.js/-/hash.js-1.1.7.tgz",
  "integrity": "sha512-taOaskGt4z4SOANNseOviYDvjEJinIkRgmp7LbKP2YTTmVxWB187s/uzK9r+44BclBSp2X7K1hqeNfz9JbBeXA==",
  "requires": {
    "inherits": "^2.0.3",
    "minimalistic-assert": "^1.0.1"
  }
},
"hmac-drbg": {
  "version": "1.0.1",
  "resolved": "https://registry.npmjs.org/hmac-drbg/-/hmac-drbg-1.0.1.tgz",
  "integrity": "sha1-0nRXAQJabHdabFRXk+1QL8DGSaE=",
  "requires": {
    "hash.js": "^1.0.3",
    "minimalistic-assert": "^1.0.0",
    "minimalistic-crypto-utils": "^1.0.1"
  }
}

```

```

    },
    "html-comment-regex": {
      "version": "1.1.2",
      "resolved": "https://registry.npmjs.org/html-comment-regex/-/html-comment-regex-1.1.2.tgz",
      "integrity": "sha512-P+M65QY2JQ5Y0G9KKdlDpo0zK+/OHptU5AaBwUfAIDJZk1MYf32Frm84EcOytfJE0t5JvkAnKlmjsXDnWzCJmQ=="
    },
    "http-errors": {
      "version": "1.7.2",
      "resolved": "https://registry.npmjs.org/http-errors/-/http-errors-1.7.2.tgz",
      "integrity": "sha512-uUQBt3H/cSIVfch6i1EuPNy/YsRSOUBXTVfZ+yR7Zjez3qjBz6i9+i4zjNaoqcoFVI4lQJ5plg63TvGfRSDCRg==",
      "requires": {
        "depd": "~1.1.2",
        "inherits": "2.0.3",
        "setprototypeof": "1.1.1",
        "statuses": ">= 1.5.0 < 2",
        "toidentifier": "1.0.0"
      },
    },
    "dependencies": {
      "inherits": {
        "version": "2.0.3",
        "resolved": "https://registry.npmjs.org/inherits/-/inherits-2.0.3.tgz",
        "integrity": "sha1-Yzwsg+PaQqUC9SRmAiSA9CCCYd4="
      }
    }
  },
  "ibm-cos-sdk": {
    "version": "1.6.0",

```

```

    "resolved": "https://registry.npmjs.org/ibm-cos-sdk/-/ibm-cos-sdk-1.6.0.tgz",
    "integrity": "sha512-
uOJAj9ErjrIt5mb1tvUErDaOKV7n5s/og/m6Kku2tXfOYYg5Ru2bU32UMBDy554scUBNbNu+4/PjEnyLf
NzEPQ==",
    "requires": {
      "buffer": "^4.9.1",
      "crypto-browserify": "^3.12.0",
      "jmespath": "^0.15.0",
      "lodash": "^4.17.15",
      "url": "^0.10.3",
      "uuid": "^3.3.2",
      "xml2js": "^0.4.19",
      "xmlbuilder": "^10.1.1"
    }
  },
  "iconv-lite": {
    "version": "0.4.24",
    "resolved": "https://registry.npmjs.org/iconv-lite/-/iconv-lite-0.4.24.tgz",
    "integrity": "sha512-
v3MXnZAcvnywkTUEZomIActle7RXXeedOR31ww17VlYoXO4Qi9arvSenNQWne1TcRwhCL1HwLI21
bEqdpj8/rA==",
    "requires": {
      "safer-buffer": ">= 2.1.2 < 3"
    }
  },
  "ieee754": {
    "version": "1.1.13",
    "resolved": "https://registry.npmjs.org/ieee754/-/ieee754-1.1.13.tgz",
    "integrity": "sha512-
4vf7I2LYV/HaWerSo3XmlMkp5eZ83i+/CDluXi/IGTs/O1sejBNhTtnxzmRZfvOUqj7lZjqHkeTvpgSFDl
WZTg=="
  },

```

```

"inherits": {
  "version": "2.0.4",
  "resolved": "https://registry.npmjs.org/inherits/-/inherits-2.0.4.tgz",
  "integrity": "sha512-iPdKaDkGPAG8G144D5Kt3D6B3L9D600Z03p3nXq3tXa4dYeZIQqewQ=="
},
"ipaddr.js": {
  "version": "1.9.1",
  "resolved": "https://registry.npmjs.org/ipaddr.js/-/ipaddr.js-1.9.1.tgz",
  "integrity": "sha512-0KI/607xoxSToH7GjN1FfSbLoU0+btTicjsQSWQlh/hZykN8KpmMf7uYwPW3R+akZ6R/w18ZIXSHBYXiYUPO3g=="
},
"is-svg": {
  "version": "2.1.0",
  "resolved": "https://registry.npmjs.org/is-svg/-/is-svg-2.1.0.tgz",
  "integrity": "sha1-z2EJDdZ77yrhyLeum8DIgjsOk=",
  "requires": {
    "html-comment-regex": "^1.1.0"
  }
},
"isarray": {
  "version": "0.0.1",
  "resolved": "https://registry.npmjs.org/isarray/-/isarray-0.0.1.tgz",
  "integrity": "sha1-ihis/Kmo9Bd+Cav8YDiTmwXR7t8="
},
"jmespath": {
  "version": "0.15.0",
  "resolved": "https://registry.npmjs.org/jmespath/-/jmespath-0.15.0.tgz",
  "integrity": "sha1-o/Iqarp+Wb10nx5ZRDigJF2Qhc="

```

```

},
"lodash": {
  "version": "4.17.15",
  "resolved": "https://registry.npmjs.org/lodash/-/lodash-4.17.15.tgz",
  "integrity": "sha512-8xOcrHvCjnocdS5cpwXQXVzmmh5e5+saE2QGoeQmbKmRS6J3VQppPOIt0MnmE+4xlZoumy0GPG0D0MVIQbNA1A=="
},
"md5.js": {
  "version": "1.3.5",
  "resolved": "https://registry.npmjs.org/md5.js/-/md5.js-1.3.5.tgz",
  "integrity": "sha512-8xOcrHvCjnocdS5cpwXQXVzmmh5e5+saE2QGoeQmbKmRS6J3VQppPOIt0MnmE+4xlZoumy0GPG0D0MVIQbNA1A==",
  "requires": {
    "hash-base": "^3.0.0",
    "inherits": "^2.0.1",
    "safe-buffer": "^5.1.2"
  }
},
"media-typer": {
  "version": "0.3.0",
  "resolved": "https://registry.npmjs.org/media-typer/-/media-typer-0.3.0.tgz",
  "integrity": "sha1-hxDXrwqmJvj/+hzgAWhUUmMIV0g="
},
"merge-descriptors": {
  "version": "1.0.1",
  "resolved": "https://registry.npmjs.org/merge-descriptors/-/merge-descriptors-1.0.1.tgz",
  "integrity": "sha1-sAqqVW3YtEVoFQ7J0blT8/kMu2E="
},
"methods": {

```



```

    "version": "1.1.2",
    "resolved": "https://registry.npmjs.org/methods/-/methods-1.1.2.tgz",
    "integrity": "sha1-VSmk1nZUE07cxSZmVoNbD4Ua/O4="
  },
  "miller-rabin": {
    "version": "4.0.1",
    "resolved": "https://registry.npmjs.org/miller-rabin/-/miller-rabin-4.0.1.tgz",
    "integrity": "sha512-115fLHVZVqWwHPbClyntxEVfVDFI9DLLTuJvq3g2O/Oxi8AiNouAHvDSzHS0viUJc+V5vm3eq91Xwqn9dp4jRA==",
    "requires": {
      "bn.js": "^4.0.0",
      "brorand": "^1.0.1"
    }
  },
  "mime": {
    "version": "1.6.0",
    "resolved": "https://registry.npmjs.org/mime/-/mime-1.6.0.tgz",
    "integrity": "sha512-x0Vn8spI+wuJ1O6S7gnbaQg8Pxh4NNHb7KSINmEWKiPE4RKOpIvijn+NkmYmmRgP68mc70j2EbeTFRsrswaQeg=="
  },
  "mime-db": {
    "version": "1.43.0",
    "resolved": "https://registry.npmjs.org/mime-db/-/mime-db-1.43.0.tgz",
    "integrity": "sha512-+5dsGEEovYbT8UY9yD7eE4XTc4UwJ1jBYlgaQQF38ENsKR3wj/8q8RFZrF9WIZpB2V1ArTVFUva8sAul1NzRzQ=="
  },
  "mime-types": {
    "version": "2.1.26",
    "resolved": "https://registry.npmjs.org/mime-types/-/mime-types-2.1.26.tgz",

```

```

    "integrity": "sha512-
01paPWYgLrkqAyrlDorC1uDwl2p3qZT7yl806vW7DvDoxwXi46jsjFbg+WdwotBlk6/MbEhO/dh5aZ5sN
j/dWQ==",
    "requires": {
      "mime-db": "1.43.0"
    },
    "minimalistic-assert": {
      "version": "1.0.1",
      "resolved": "https://registry.npmjs.org/minimalistic-assert/-/minimalistic-assert-1.0.1.tgz",
      "integrity": "sha512-
UtJcAD4yEaGtjPezWuO9wC4nwUnVH/8/Im3yEHQP4b67cXlD/Qr9hdITCU1xDbSEXg2XKNaP8jsReV
7vQd00/A=="
    },
    "minimalistic-crypto-utils": {
      "version": "1.0.1",
      "resolved": "https://registry.npmjs.org/minimalistic-crypto-utils/-/minimalistic-crypto-utils-1.0.1.tgz",
      "integrity": "sha1-9sAMHAsIikblxNmd+4x8CDsrWCo="
    },
    "minimist": {
      "version": "1.2.5",
      "resolved": "https://registry.npmjs.org/minimist/-/minimist-1.2.5.tgz",
      "integrity": "sha512-
FM9nNUYrRBAELZQT3xeZQ7fmMOBg6nWNmJKTcgsJeaLstP/UODVpGsr5OhXhhXg6f+qtJ8uiZ+PU
xkDWcgIXLw=="
    },
    "mkdirp": {
      "version": "0.5.4",
      "resolved": "https://registry.npmjs.org/mkdirp/-/mkdirp-0.5.4.tgz",
      "integrity": "sha512-
iG9AK/dJLtJ0XNgTuDbSyNS3zECqDlAhnQW4CsNxBG3LQJBbHmRX1egw39DmtOdCAqY+dKXV+s
gPgilNWUKMVw=="
    },
    "requires": {

```

```

    "minimist": "^1.2.5"
  }
},
"ms": {
  "version": "2.0.0",
  "resolved": "https://registry.npmjs.org/ms/-/ms-2.0.0.tgz",
  "integrity": "sha1-VgiurfwAvmwpAd9fmGF4jeDVl8g=",
},
"multer": {
  "version": "1.4.2",
  "resolved": "https://registry.npmjs.org/multer/-/multer-1.4.2.tgz",
  "integrity": "sha512-xY8pX7V+ybyUpbYMxtjM9KAiD9ixtg5/JkeKUTD6xildv0vzzOFcCp4Ljb1UU3tSOM3VTZtKo63OmzOrGi3Cg==",
  "requires": {
    "append-field": "^1.0.0",
    "busboy": "^0.2.11",
    "concat-stream": "^1.5.2",
    "mkdirp": "^0.5.1",
    "object-assign": "^4.1.1",
    "on-finished": "^2.3.0",
    "type-is": "^1.6.4",
    "xtend": "^4.0.0"
  }
},
"multer-s3": {
  "version": "2.9.0",
  "resolved": "https://registry.npmjs.org/multer-s3/-/multer-s3-2.9.0.tgz",
  "integrity": "sha512-qLF8pCD5HhXLLd954q49B63x3bk6Fe0jqD3eM0FVcGtqhiSVuTrchEDAo0mnO5pc34cMuX/CVCCbPkGTjX2xUA==",

```

```

    "requires": {
      "file-type": "^3.3.0",
      "is-svg": "^2.1.0",
      "run-parallel": "^1.1.6"
    }
  },
  "negotiator": {
    "version": "0.6.2",
    "resolved": "https://registry.npmjs.org/negotiator/-/negotiator-0.6.2.tgz",
    "integrity": "sha512-hZXc7K2e+PgeI1eDBE/10Ard4ekbfrqG8Ep+8Jmf4JID2bNg7NvCPOZN+kfF574pFQI7mum2AUqDidoKqcTOw=="
  },
  "object-assign": {
    "version": "4.1.1",
    "resolved": "https://registry.npmjs.org/object-assign/-/object-assign-4.1.1.tgz",
    "integrity": "sha1-IQmtx5ZYh8/AXLvUQsrIv7s2CGM="
  },
  "on-finished": {
    "version": "2.3.0",
    "resolved": "https://registry.npmjs.org/on-finished/-/on-finished-2.3.0.tgz",
    "integrity": "sha1-IPEzZIGwg811M3mSoWlXqi2QaUc=",
    "requires": {
      "ee-first": "1.1.1"
    }
  },
  "parse-asn1": {
    "version": "5.1.5",
    "resolved": "https://registry.npmjs.org/parse-asn1/-/parse-asn1-5.1.5.tgz",

```

```

    "integrity": "sha512-
jkMYn1dcJqF6d5CpU689bq7w/b5ALS9ROVSpQDPrZsqqsUJii9qutvoT5ltGedNXMO2e16YUWIghG9
KxaViTQ==",
    "requires": {
      "asn1.js": "^4.0.0",
      "browserify-aes": "^1.0.0",
      "create-hash": "^1.1.0",
      "evp_bytestokey": "^1.0.0",
      "pbkdf2": "^3.0.3",
      "safe-buffer": "^5.1.1"
    }
  },
  "parseurl": {
    "version": "1.3.3",
    "resolved": "https://registry.npmjs.org/parseurl/-/parseurl-1.3.3.tgz",
    "integrity": "sha512-
CiyeOxFT/JZyN5m0z9PfXw4SCBJ6Sygz1Dpl0wqjlhDEGGBP1GnsUVEL0p63hoG1fcj3fHynXi9NYO4n
WOL+qQ=="
  },
  "path-to-regexp": {
    "version": "0.1.7",
    "resolved": "https://registry.npmjs.org/path-to-regexp/-/path-to-regexp-0.1.7.tgz",
    "integrity": "sha1-32BBeABfUi8V60SQ5yR6G/qmf4w="
  },
  "pbkdf2": {
    "version": "3.0.17",
    "resolved": "https://registry.npmjs.org/pbkdf2/-/pbkdf2-3.0.17.tgz",
    "integrity": "sha512-
U/il5MsrZp7mGg3mSQfn742na2T+1/vHDCG5/iTI3X9MKUuYUZVLQhyRsg06mCgDBTd57TxzgZt7P+
fYfjRLtA==",
    "requires": {
      "create-hash": "^1.1.2",

```

```

    "create-hmac": "^1.1.4",
    "ripemd160": "^2.0.1",
    "safe-buffer": "^5.0.1",
    "sha.js": "^2.4.8"
  },
  "process-nextick-args": {
    "version": "2.0.1",
    "resolved": "https://registry.npmjs.org/process-nextick-args/-/process-nextick-args-2.0.1.tgz",
    "integrity": "sha512-3ouUOpQhtgrbOa17J7+uxOTpITYWaGP7/AhoR3+A+/1e9skrzelGi/dXzEYyvbuxubEF6Wn2ypscTKiKJF
    FnIag=="
  },
  "proxy-addr": {
    "version": "2.0.6",
    "resolved": "https://registry.npmjs.org/proxy-addr/-/proxy-addr-2.0.6.tgz",
    "integrity": "sha512-dh/frvCBVmSsDYzw6n926jv974gddhkFPfiN8hPOi30Wax25QZyZEGveluCgliBnqmuM+UJmBErbAUFI
    oDbjOw==",
    "requires": {
      "forwarded": "~0.1.2",
      "ipaddr.js": "1.9.1"
    }
  },
  "public-encrypt": {
    "version": "4.0.3",
    "resolved": "https://registry.npmjs.org/public-encrypt/-/public-encrypt-4.0.3.tgz",
    "integrity": "sha512-zVpa8oKZSz5bTMTFC1c1fQOnyyEzpl5ozpi1B5YcvBrdohMjH2rfsBtyXcuNuwijsDIXmBY1F2N5FIJYhR
    29t8Q==",
    "requires": {
      "bn.js": "^4.1.0",

```

```

    "browserify-rsa": "^4.0.0",
    "create-hash": "^1.1.0",
    "parse-asn1": "^5.0.0",
    "randombytes": "^2.0.1",
    "safe-buffer": "^5.1.2"
  }
},
"punycode": {
  "version": "1.3.2",
  "resolved": "https://registry.npmjs.org/punycode/-/punycode-1.3.2.tgz",
  "integrity": "sha1-lLOgNvt8HuQjQvIyXM7v6jkmxI0="
},
"qs": {
  "version": "6.7.0",
  "resolved": "https://registry.npmjs.org/qs/-/qs-6.7.0.tgz",
  "integrity": "sha512-VVCdBRNFTX1fyE7Nb6FYoURo/SPe62QCaAyzJvUjwRaIsc+NePBEhiHlVxFmmX56+HZphIGtV0XeCirBtpDrTyQ==",
  "integrity": "sha512-VCdBRNFTX1fyE7Nb6FYoURo/SPe62QCaAyzJvUjwRaIsc+NePBEhiHlVxFmmX56+HZphIGtV0XeCirBtpDrTyQ==",
},
"querystring": {
  "version": "0.2.0",
  "resolved": "https://registry.npmjs.org/querystring/-/querystring-0.2.0.tgz",
  "integrity": "sha1-sgmEkgO7Jd+CDadW50cAWHhSFIA="
},
"randombytes": {
  "version": "2.1.0",
  "resolved": "https://registry.npmjs.org/randombytes/-/randombytes-2.1.0.tgz",
  "integrity": "sha512-vY13iOX+4CKUWuxGi9Ukhie6fsqXqS9FE2Zaic4tNFD2N2QQaXOMFbuKK4QmDHC0JO6B1Zp41J0LpT0oR68amQ==",
  "requires": {

```

```

    "safe-buffer": "^5.1.0"
  },
},
"randomfill": {
  "version": "1.0.4",
  "resolved": "https://registry.npmjs.org/randomfill/-/randomfill-1.0.4.tgz",
  "integrity": "sha512-87lcbR8+MhcWcUiQ+9e+Rwx8MyR2P7qnt15ynUlbm3TU/fjbgz4GsvfSUDTemtCCtVCqb4ZcEFlyPNTh9bBTLw==",
  "requires": {
    "randombytes": "^2.0.5",
    "safe-buffer": "^5.1.0"
  }
},
"range-parser": {
  "version": "1.2.1",
  "resolved": "https://registry.npmjs.org/range-parser/-/range-parser-1.2.1.tgz",
  "integrity": "sha512-80332883C723405A07174069d99B8070241758BA3B0F7900177D85D536569270",
  "requires": {}
},
"raw-body": {
  "version": "2.4.0",
  "resolved": "https://registry.npmjs.org/raw-body/-/raw-body-2.4.0.tgz",
  "integrity": "sha512-53d80CqqhuK4c61XWb98WqDUdpK/S3ZvKzBz1n5TOB5e6wF0Wj9VH6I2/q82FIKJJk3HdnuTVuQasS2B5w==",
  "requires": {
    "bytes": "3.1.0",
    "http-errors": "1.7.2",
    "iconv-lite": "0.4.24",
    "unpipe": "1.0.0"
  }
}

```



```

    }
  },
  "readable-stream": {
    "version": "1.1.14",
    "resolved": "https://registry.npmjs.org/readable-stream/-/readable-stream-1.1.14.tgz",
    "integrity": "sha1-fPTFTvZI44EwhMY23SB54WbAgdk=",
    "requires": {
      "core-util-is": "~1.0.0",
      "inherits": "~2.0.1",
      "isarray": "0.0.1",
      "string_decoder": "~0.10.x"
    }
  },
  "ripemd160": {
    "version": "2.0.2",
    "resolved": "https://registry.npmjs.org/ripemd160/-/ripemd160-2.0.2.tgz",
    "integrity": "sha512-ii4iagi25WusVoiC4B4lq7pbXfAp3D9v5CwfkY33vffw2+pkDjY1D8GaN7spsxvCSx8dkPqOZCEZyfxcmJG2IA==",
    "requires": {
      "hash-base": "^3.0.0",
      "inherits": "^2.0.1"
    }
  },
  "run-parallel": {
    "version": "1.1.9",
    "resolved": "https://registry.npmjs.org/run-parallel/-/run-parallel-1.1.9.tgz",
    "integrity": "sha512-DEqnSRTDw/Tc3FXf49zedI638Z9onwUotBMiUFKmrO2sdFKIbXamXGQ3Axd4qgphxKB4kw/qP1w5kTxnfU1B9Q=="
  },

```

```

"safe-buffer": {
  "version": "5.1.2",
  "resolved": "https://registry.npmjs.org/safe-buffer/-/safe-buffer-5.1.2.tgz",
  "integrity": "sha512-Gd2UZBJDkXlY7GbJxfsE8/nvKkUEU1G38c1siN6QP6a9PT9MmHB8GnpScSmMJSofF8LOIrt8ud/wPtoj
ys4G6+g=="
},
"safer-buffer": {
  "version": "2.1.2",
  "resolved": "https://registry.npmjs.org/safer-buffer/-/safer-buffer-2.1.2.tgz",
  "integrity": "sha512-YZo3K82SD7Riyi0E1EQPojLz7kpepnSQI9IyPbHHg1XXXevb5dJI7tpyN2ADxGcQbHG7vcyRHk0cbwq
cQriUtg=="
},
"sax": {
  "version": "1.2.4",
  "resolved": "https://registry.npmjs.org/sax/-/sax-1.2.4.tgz",
  "integrity": "sha512-NqVDv9TpANUjFm0N8uM5GxL36UgKi9/atZw+x7YFnQ8ckwFGKrl4xX4yWtrey3UJm5nP1kUbnYgLo
pqWNSRhWw=="
},
"send": {
  "version": "0.17.1",
  "resolved": "https://registry.npmjs.org/send/-/send-0.17.1.tgz",
  "integrity": "sha512-BsVKsiGcQMFWT8UxypobUKyv7irCNRHk1T0G680vk88yf6LBBYgCzJOTJCrTP2xVN6yI+XjPJcNuE3
V4fT9sAg==",
  "requires": {
    "debug": "2.6.9",
    "depd": "~1.1.2",
    "destroy": "~1.0.4",
    "encodeurl": "~1.0.2",
    "escape-html": "~1.0.3",

```

```

    "etag": "~1.8.1",
    "fresh": "0.5.2",
    "http-errors": "~1.7.2",
    "mime": "1.6.0",
    "ms": "2.1.1",
    "on-finished": "~2.3.0",
    "range-parser": "~1.2.1",
    "statuses": "~1.5.0"
  },
  "dependencies": {
    "ms": {
      "version": "2.1.1",
      "resolved": "https://registry.npmjs.org/ms/-/ms-2.1.1.tgz",
      "integrity": "sha512-tgp+dl5cGk28utYktBsrFqA7HKgrhgPsg6Z/EfhWI4gl1Hwq8B/GmY/0oXZ6nF8hDVesS/FpnYaD/kOWhYQvyg=="
    }
  },
  "serve-static": {
    "version": "1.14.1",
    "resolved": "https://registry.npmjs.org/serve-static/-/serve-static-1.14.1.tgz",
    "integrity": "sha512-JMrvUwE54emCYWITI+hGrGv5I8dEwmco/00EvkzIIsR7MqrHonbD9pO2MOfFnpFntl7ecpZs+3mW+XbQZu9QCg==",
    "requires": {
      "encodeurl": "~1.0.2",
      "escape-html": "~1.0.3",
      "parseurl": "~1.3.3",
      "send": "0.17.1"
    }
  }

```

```

    },
    "setprototypeof": {
      "version": "1.1.1",
      "resolved": "https://registry.npmjs.org/setprototypeof/-/setprototypeof-1.1.1.tgz",
      "integrity": "sha512-JvdAWfbXeIGaZ9cILp38HntZSFSO3mWg6xGcJJsd+d4aRMOqauag1C63dJfDw7OaMYwEbHMOxEZ11qVRYP2OA==",
    },
    "sha.js": {
      "version": "2.4.11",
      "resolved": "https://registry.npmjs.org/sha.js/-/sha.js-2.4.11.tgz",
      "integrity": "sha512-NvupOxLqUkMZd7r/jEjvUP7gYOzGzFg3qPPKE28025V0+6wHtD7nX3ZaXs1l+qWv0hD4qY4r01hX338w==",
      "requires": {
        "inherits": "^2.0.1",
        "safe-buffer": "^5.0.1"
      }
    },
    "statuses": {
      "version": "1.5.0",
      "resolved": "https://registry.npmjs.org/statuses/-/statuses-1.5.0.tgz",
      "integrity": "sha1-Fh9rBd2Wf2YefQ3cfqZOB4Yow="
    },
    "streamsearch": {
      "version": "0.1.2",
      "resolved": "https://registry.npmjs.org/streamsearch/-/streamsearch-0.1.2.tgz",
      "integrity": "sha1-gIudDlb8Jz2Am6VzOOKpkZoanxo="
    },
    "string_decoder": {
      "version": "0.10.31",

```

```

    "resolved": "https://registry.npmjs.org/string_decoder/-/string_decoder-0.10.31.tgz",
    "integrity": "sha1-YuIDvEF2bGwoyfyEMB2rHFMQ+pQ=",
  },
  "toidentifier": {
    "version": "1.0.0",
    "resolved": "https://registry.npmjs.org/toidentifier/-/toidentifier-1.0.0.tgz",
    "integrity": "sha512-yaOH/Pk/VEhBWWTlhI+qXxDFXlejDGcQipMlyxda9nthulaxLZUNcUqFxokp0vcYnvteJln5FNQDRrxj3YcbVw==",
  },
  "type-is": {
    "version": "1.6.18",
    "resolved": "https://registry.npmjs.org/type-is/-/type-is-1.6.18.tgz",
    "integrity": "sha512-TkRKr9sUTxeh8MdfuCSP7VizJyzRNMjj2J2do2Jr3Kym598JVdEksuzPQCnlFPW4ky9Q+iA+ma9BGm06XQBy8g==",
    "requires": {
      "media-typer": "0.3.0",
      "mime-types": "~2.1.24"
    }
  },
  "typedarray": {
    "version": "0.0.6",
    "resolved": "https://registry.npmjs.org/typedarray/-/typedarray-0.0.6.tgz",
    "integrity": "sha1-hnrHTjkhGHsdPUfZlqeOxciDB3c=",
  },
  "unpipe": {
    "version": "1.0.0",
    "resolved": "https://registry.npmjs.org/unpipe/-/unpipe-1.0.0.tgz",
    "integrity": "sha1-sr9O6FFKrmFltIF4KdIbLvSZBOw=",
  },

```

```

"url": {
  "version": "0.10.3",
  "resolved": "https://registry.npmjs.org/url/-/url-0.10.3.tgz",
  "integrity": "sha1-Ah5NnHcF8hu/N9A861h2dAJ3TGQ=",
  "requires": {
    "punycode": "1.3.2",
    "querystring": "0.2.0"
  }
},
"util-deprecate": {
  "version": "1.0.2",
  "resolved": "https://registry.npmjs.org/util-deprecate/-/util-deprecate-1.0.2.tgz",
  "integrity": "sha1-RQ1Nyfpw3nMnYvvS1KKJgUGaDM8=",
},
"utils-merge": {
  "version": "1.0.1",
  "resolved": "https://registry.npmjs.org/utils-merge/-/utils-merge-1.0.1.tgz",
  "integrity": "sha1-n5VxD1CiZ5R7LMwSR0HBAoQn5xM=",
},
"uuid": {
  "version": "3.4.0",
  "resolved": "https://registry.npmjs.org/uuid/-/uuid-3.4.0.tgz",
  "integrity": "sha512-HjSDRw6gZE5JMggctHBcjVak08+KEVhSliDzFnT9S9aegmp85S/bReBVTb4QTFaRNptJ9kuYaNhnbnE
OkbKb/A=="
},
"vary": {
  "version": "1.1.2",
  "resolved": "https://registry.npmjs.org/vary/-/vary-1.1.2.tgz",
  "integrity": "sha1-IpnwLG3tMNSlIhsLn3RSShj2NPw="
}

```

```

},
"xml2js": {
  "version": "0.4.23",
  "resolved": "https://registry.npmjs.org/xml2js/-/xml2js-0.4.23.tgz",
  "integrity": "sha512-ySPiMjmM0+pLDftHgXY4By0uswI3SPKLDw/i3UXbnO8M/p28zqexCUoPmQFrYD+/1BzhGJSs2i1ERW
  KJAtiLrug==",
  "requires": {
    "sax": ">=0.6.0",
    "xmlbuilder": "~11.0.0"
  },
  "dependencies": {
    "xmlbuilder": {
      "version": "11.0.1",
      "resolved": "https://registry.npmjs.org/xmlbuilder/-/xmlbuilder-11.0.1.tgz",
      "integrity": "sha512-fDlsI/kfEx7gLvbecc0/ohLG50fugQp8ryHzMTuW9vSa1GJ0XYWKnhsUx7oie3G98+r56aTQIUB4kht42R
      3JvA=="
    }
  },
},
"xmlbuilder": {
  "version": "10.1.1",
  "resolved": "https://registry.npmjs.org/xmlbuilder/-/xmlbuilder-10.1.1.tgz",
  "integrity": "sha512-OyzrcFLL/nb6fMGHbiRDuPup9ljBycsdCypwuyg5AAHvyWzGfChJpCXMG88AGTIMFhGZ9RccFN1e6
  lhg3hkwKg=="
},
"xtend": {
  "version": "4.0.2",
  "resolved": "https://registry.npmjs.org/xtend/-/xtend-4.0.2.tgz",

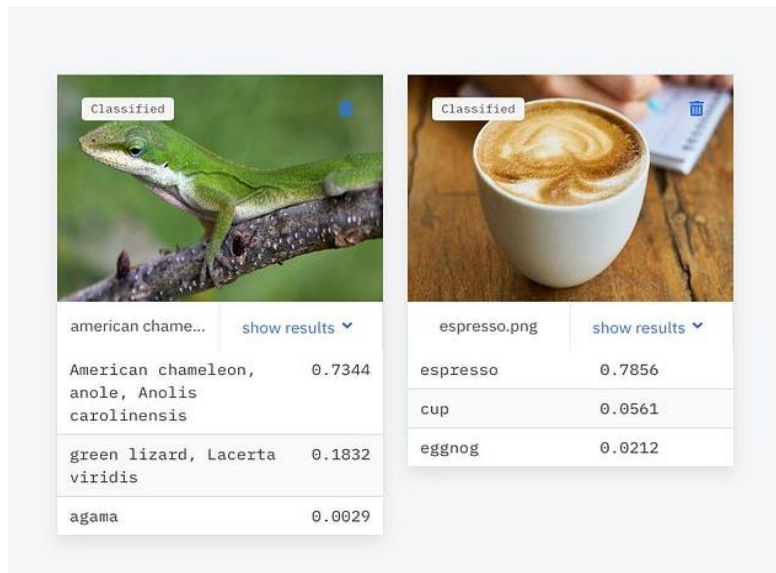
```

```

    "integrity": "sha512-
LKYU1iAXJXUgAXn9URjiu+MWhyUXHsvfp7mcuYm9dSUKK0/CjtrUwFAxD82/mCWbtLsGjFIad0wI
sod4zrTAEQ=="
  }
}

```

### SAMPLE OUTPUT:



### CONCLUSION:

In conclusion, the journey of implementing image recognition using IBM Cloud has been both challenging and rewarding. Through leveraging the power of IBM's advanced cloud-based technologies, we have successfully developed a robust image recognition system that demonstrates the potential of artificial intelligence in visual analysis.

Our project showcases the effectiveness of IBM Cloud services, particularly in the realms of machine learning and computer vision. The seamless integration of Watson Visual Recognition API has empowered our system to accurately classify and identify objects within images, opening up possibilities for various applications in diverse industries.

As we wrap up this project, it's essential to acknowledge the continuous evolution of technology and the dynamic nature of the field. While we celebrate our achievements, we also recognize the need for ongoing improvements and updates to stay at the forefront of innovation.