Python skills evaluation [EN]

Istruzioni

We want to implement a solution that prepares data for training an object detection model. The main features are as follows:

- conversion of labeling data from one format to another
- preparation of images

Input

- images in jpg format
- image annotations in xml format (one file per image)

Task

Implement a python application that performs the following operations:

read xml files

- parses the contents of these files
- resize images if dimensions exceed 800px (width) x 450px (height)
- save the final images in a dedicated folder to have a complete folder with all the images in their final version, whether they have been resized or not
- recalculates the coordinates of the bounding boxes of annotated objects to adapt them to the new dimensions of the image, if it has been resized
- composes an output file in json format and saves it to disk

Data Format

The xml files contain the labeling data relating to a single image in Pascal VOC format.

It is required to merge these records into a single file in the simplified COCO format whose structure is shown below:

```
{
    "categories": [category],
    "images": [image],
    "annotations": [annotation]
}

category = {
    "id": int,
    "name": str,
    "supercategory": str
}

image = {
    "id": int,
    "width": int,
    "height": int,
    "file_name": str
}

annotation = {
    "id": id,
    "image_id": int,
    "category_id": int,
    "bbox": [x, y, width, height]
}
```

Requirements

the solution can be composed of multiple python modules according to the author's evaluations, but by setting up a single entrypoint module "app.py"

the execution of the application will be done by running the entrypoint module "app.py" which will accept three parameters:

- imagedir - path to the folder with images
- xmldir - path to the folder with the xml files with the original labeling data
- outputdir - path to the output folder where the images and the produced json file will be saved

Delivery

the solution must be shared loaded in a git repository complete with all the files and modules needed to run the application, list of dependencies and more that is deemed necessary for the completeness of the project