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# Apparel Window Recommendation

At each time-step we have to recommend a window of 4 images which are based on previous likes, dislikes and neutral choice of user. So we have used 2 different techniques to achieve this.

**Technique 1 :**

1. Initially we have 5000 image Databases. We calculate embedding of these images from pretrained model ResNet50.
2. Compute cosine-similarity matrix between these embeddings.
3. Now initially we show 4 random images. And users like, dislike or give neutral opinion on these images.
4. We find similarity between liked and database images and extract top 50% of it, for dislike and database images also find similarity and remove top 20 images and add bottom images which may be similar and for neutral and database images we take top 10 images and add that also in our case. So we make a new database of these images (which is ~3000 in avg case from 5000). (new database which is narrow down database from all original images every time so we got narrow down on choices)
5. Now from the new database we take the top 3 images and one image randomly from this new database and show these 4 into a window of images.
6. 4 and 5 repeats till our catalog ends or the user will find his/her desired item.

**Technique 2:**

1. First 3 steps are the same.
2. Here we maintain one hidden\_embedding which comes from previous timestep, let's say we are at timestep T so we take linear combination of all previous liked image embedding and this hidden\_embedding and new database of image as mentioned is previous one to find similarity and show top similar image into 4th place. For 1st and 2nd image we used similar approach and 3rd image we show randomly from this new database.
3. Repeat step 2.

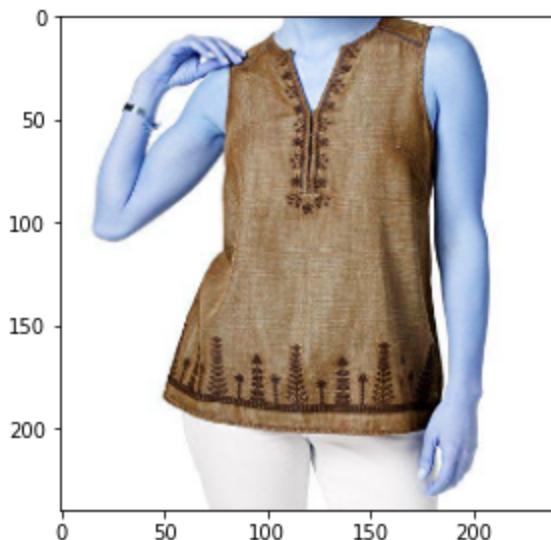
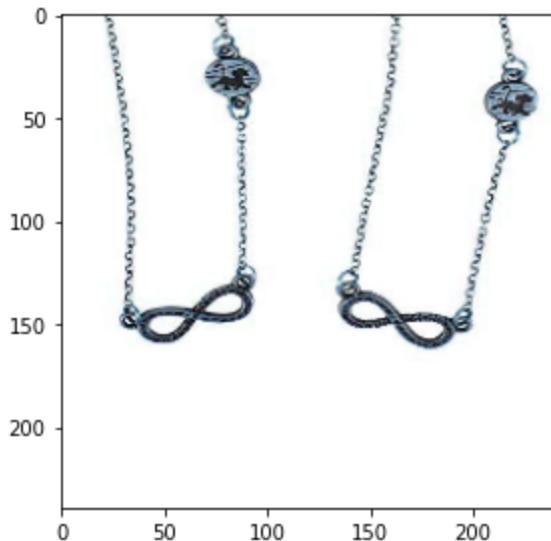
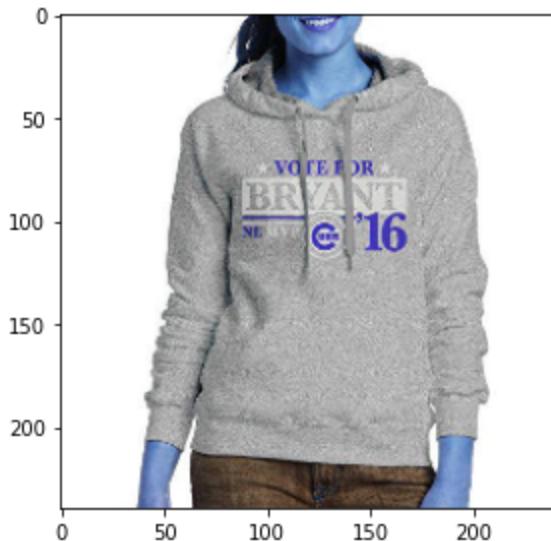
Average time to generate a new window is 0.035 seconds.

Any CPU with minimum 4 GB ram.

## **Technique-1 Output :**

## **Technique-2 Output :**

Lets say initially 4 random image and then we decided we want hoodies and selected based on that and each iteration we get hoodies and its variation.



like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 2

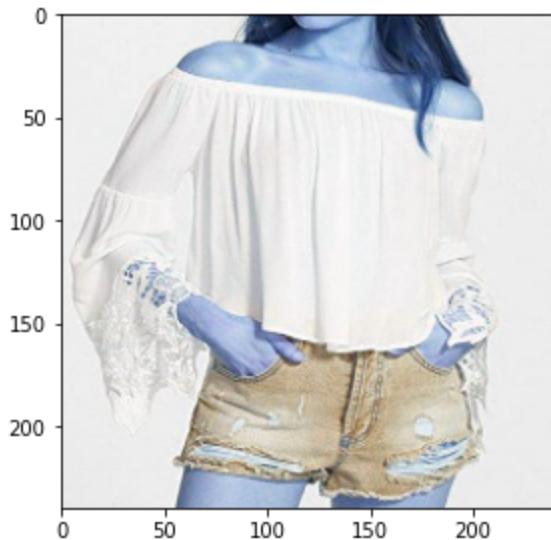
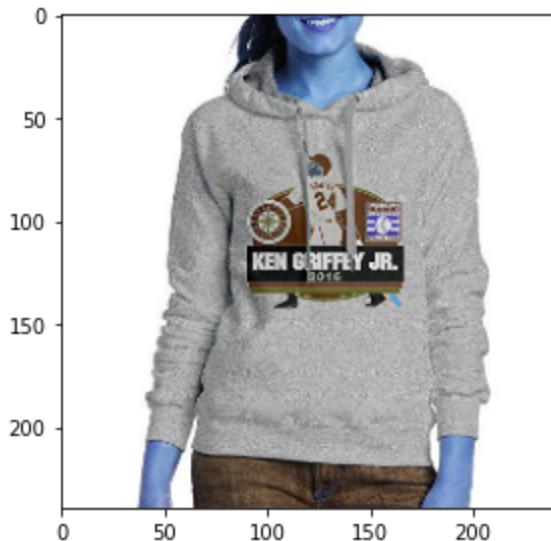
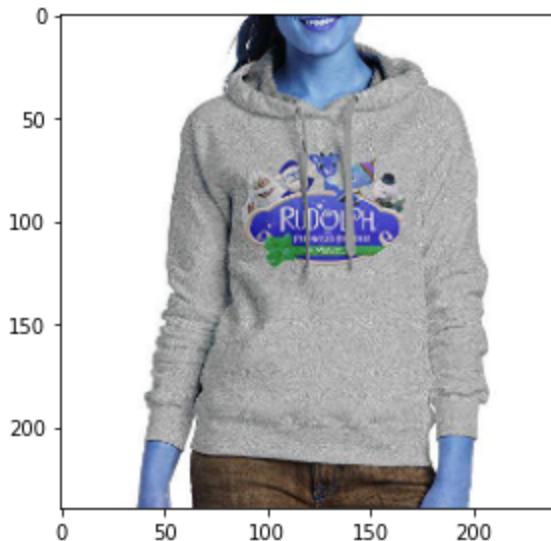
Image 3 - 2

Image 4 - 2

goto next yes(1) no(0)1

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Recommended Product 2500 compute time 0.03372645378112793



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 1

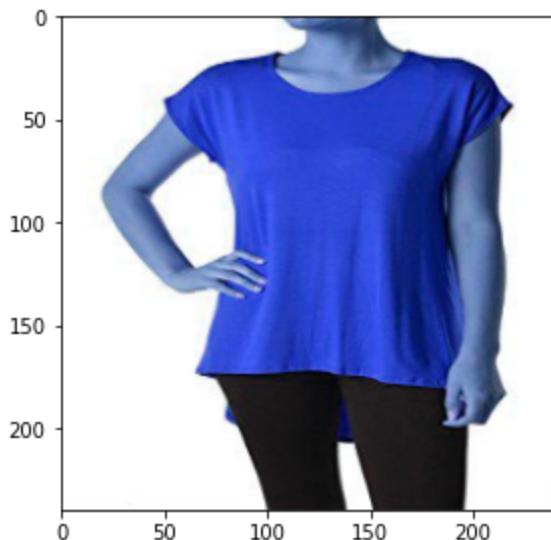
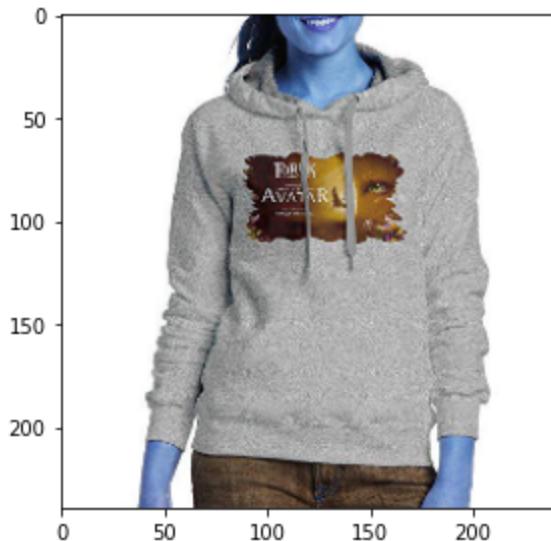
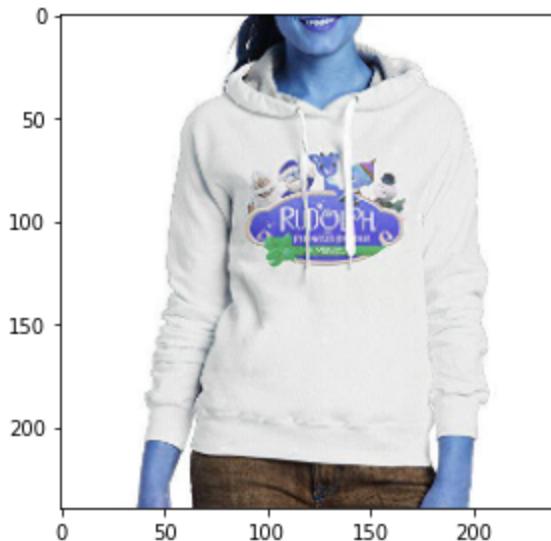
Image 3 - 2

Image 4 - 2

goto next yes(1) no(0)1

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Recommended Product 1422 compute time 0.03439593315124512



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 1

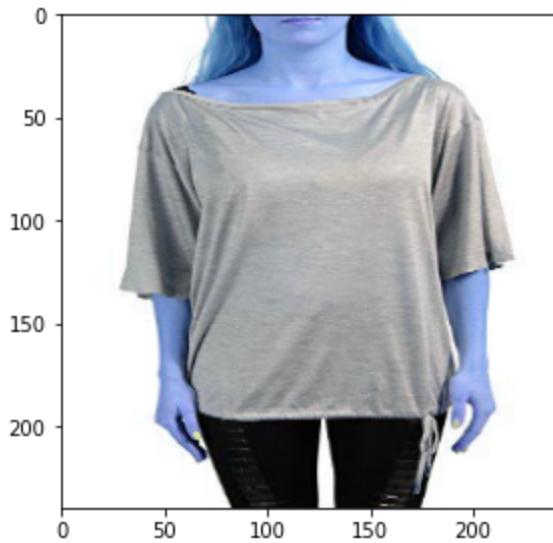
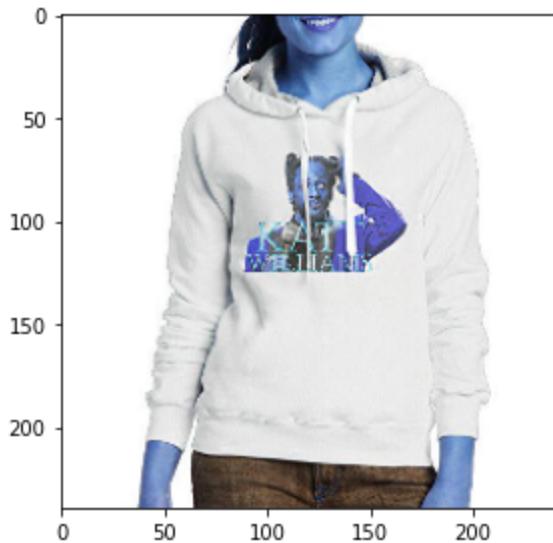
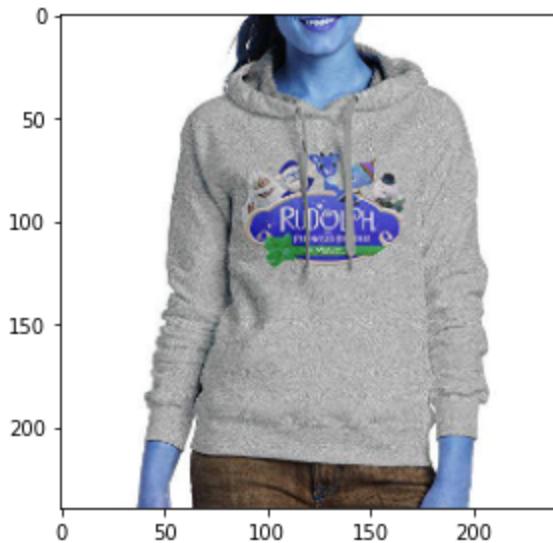
Image 3 - 2

Image 4 - 2

goto next yes(1) no(0)1

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Recommended Product 901 compute time 0.029905080795288086



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 2

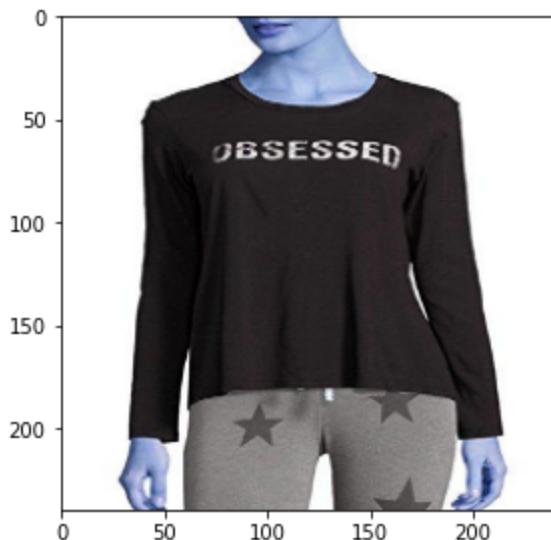
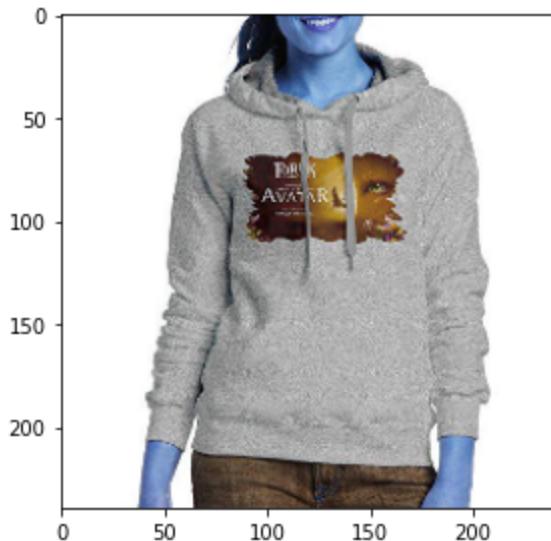
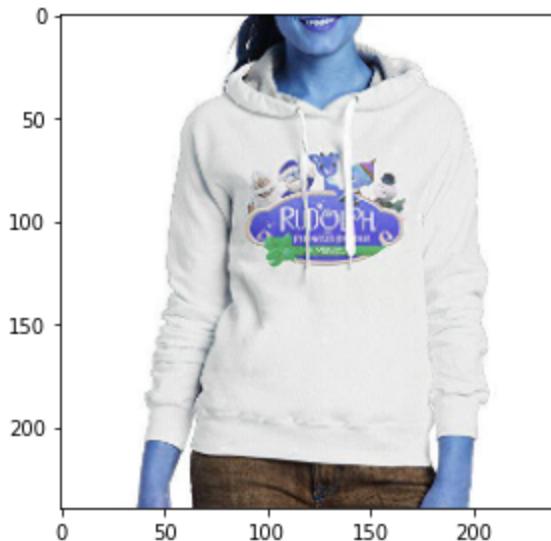
Image 3 - 2

Image 4 - 2

goto next yes(1) no(0)1

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Recommended Product 450 compute time 0.019913434982299805



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 2

Image 2 - 1

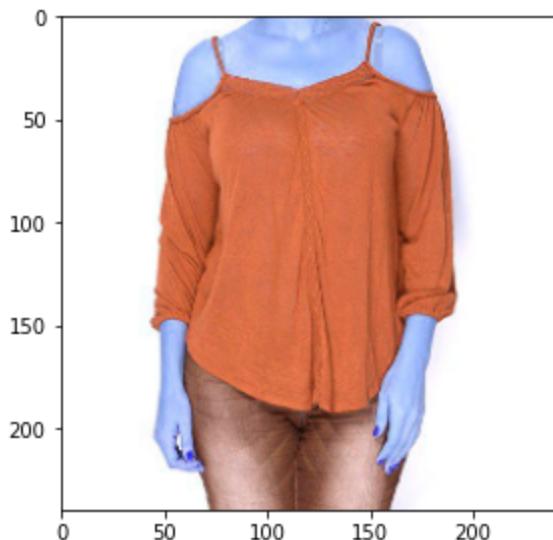
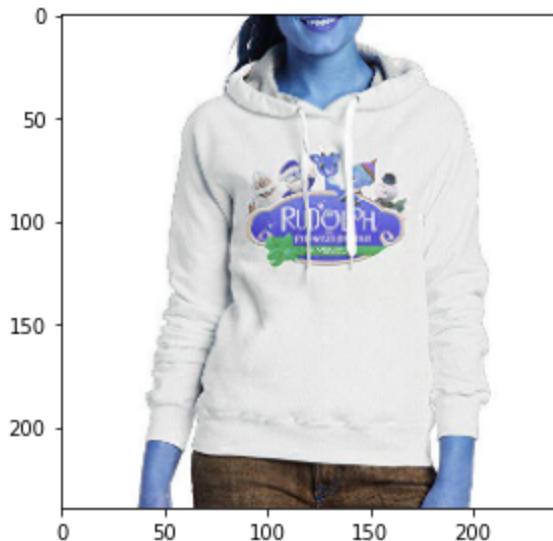
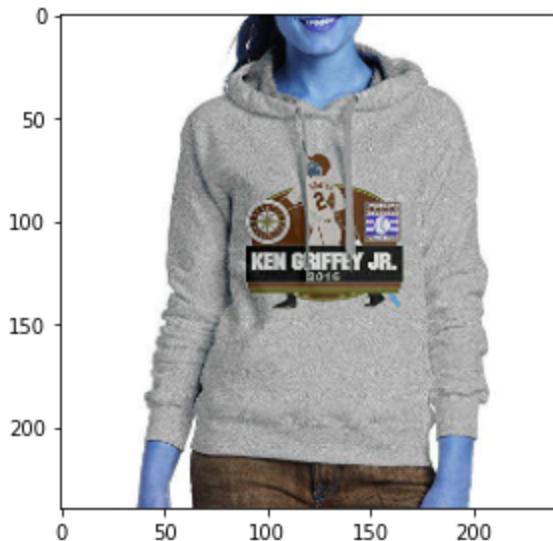
Image 3 - 2

Image 4 - 2

goto next yes(1) no(0)1

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Recommended Product 225 compute time 0.022846221923828125



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 2

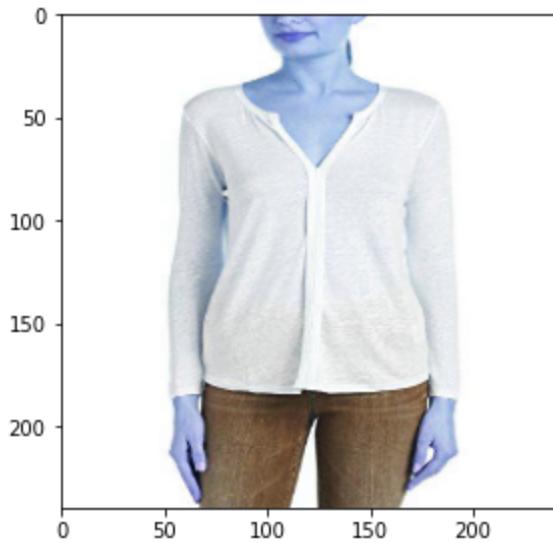
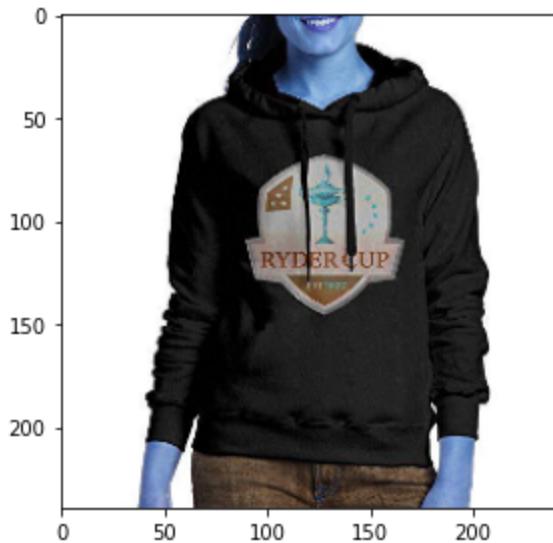
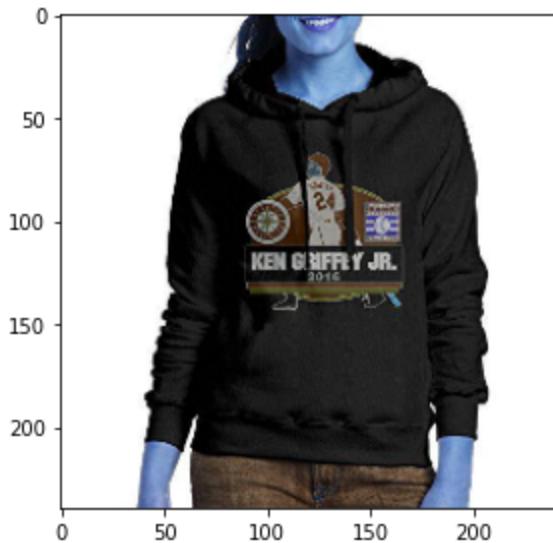
Image 3 - 2

Image 4 - 2

goto next yes(1) no(0)1

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Recommended Product 112 compute time 0.02256631851196289



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 1

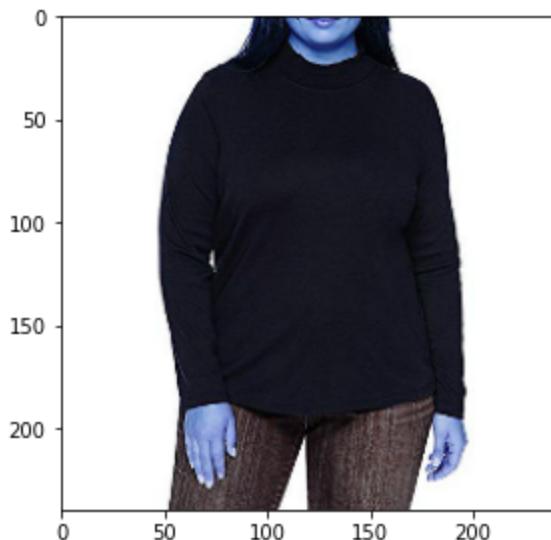
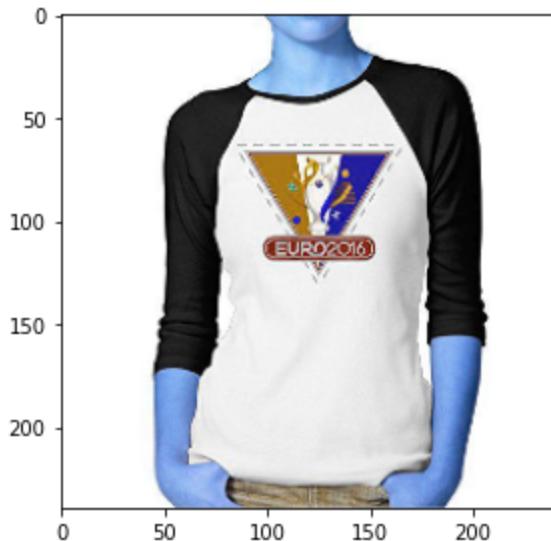
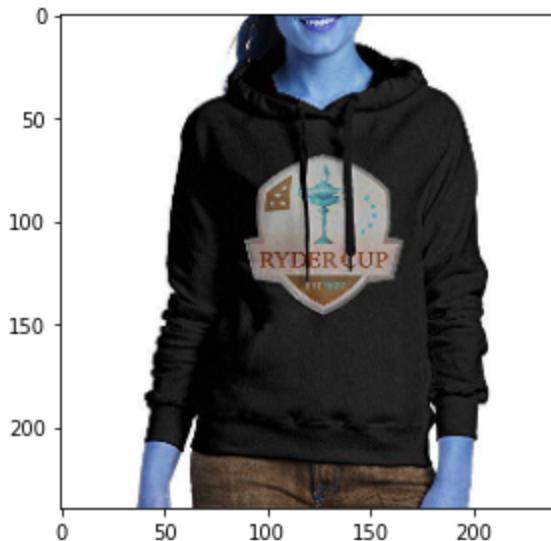
Image 3 - 2

Image 4 - 2

goto next yes(1) no(0)1

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Recommended Product 62 compute time 0.024268150329589844



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 1

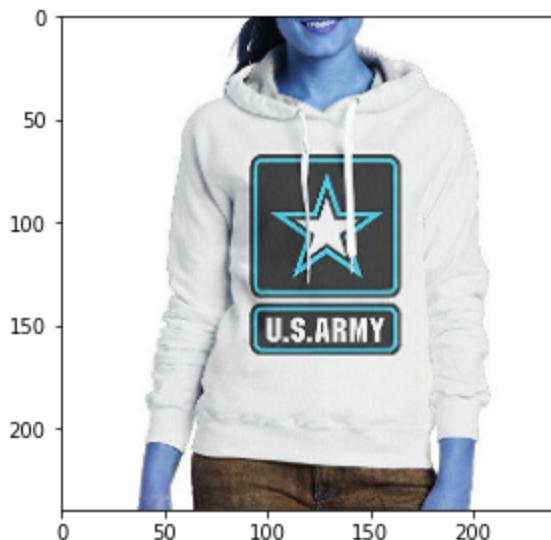
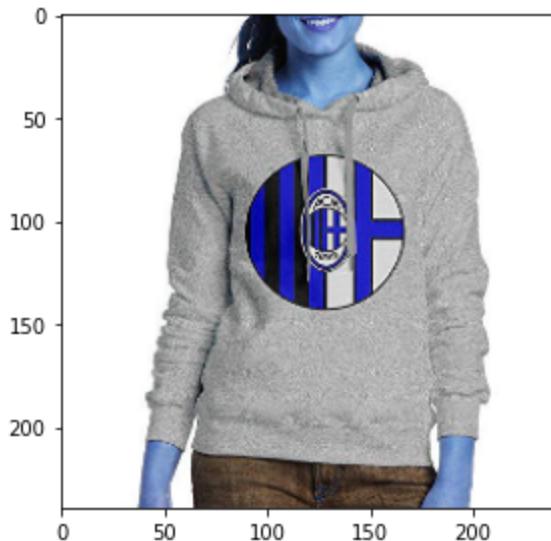
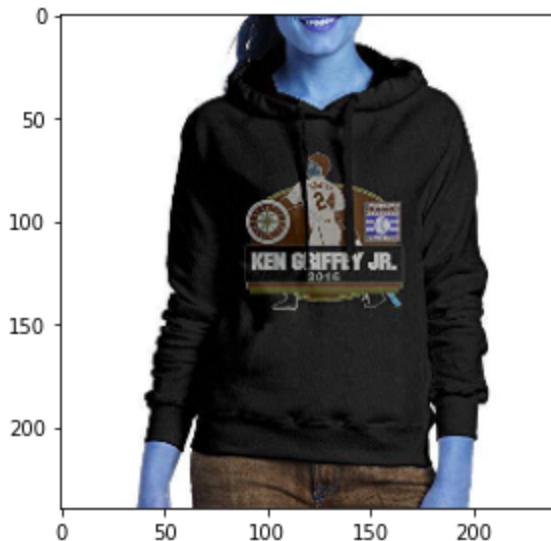
Image 3 - 2

Image 4 - 3

goto next yes(1) no(0)1

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Recommended Product 44 compute time 0.026004314422607422



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 1

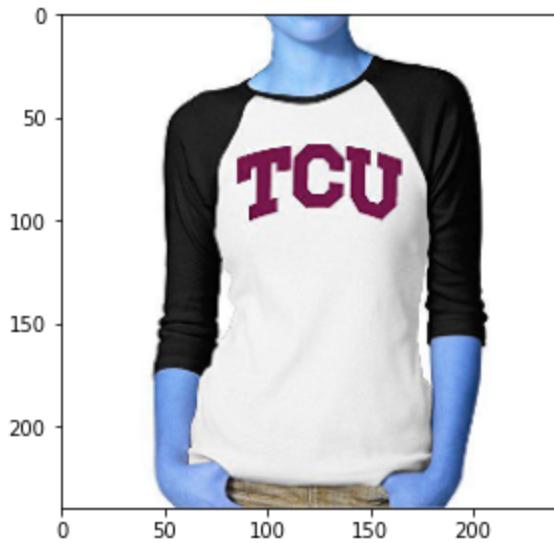
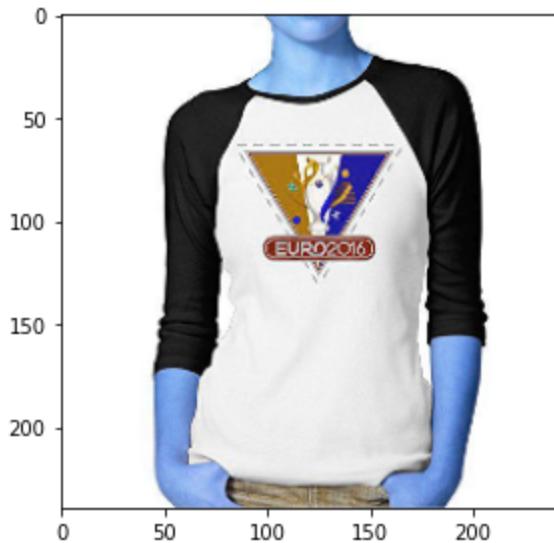
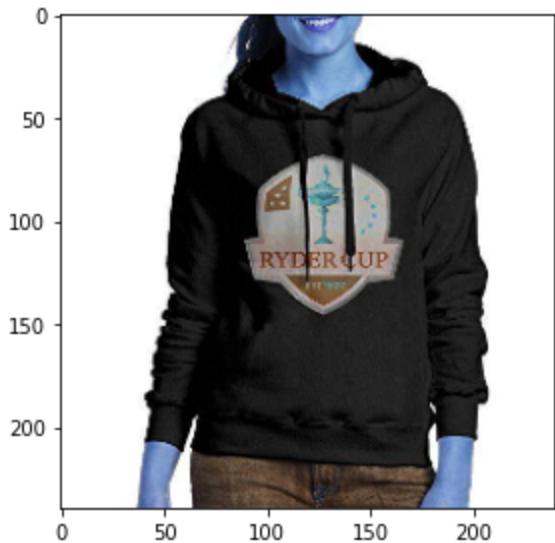
Image 3 - 2

Image 4 - 1

goto next yes(1) no(0)1

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Recommended Product 40 compute time 0.025069236755371094



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 2

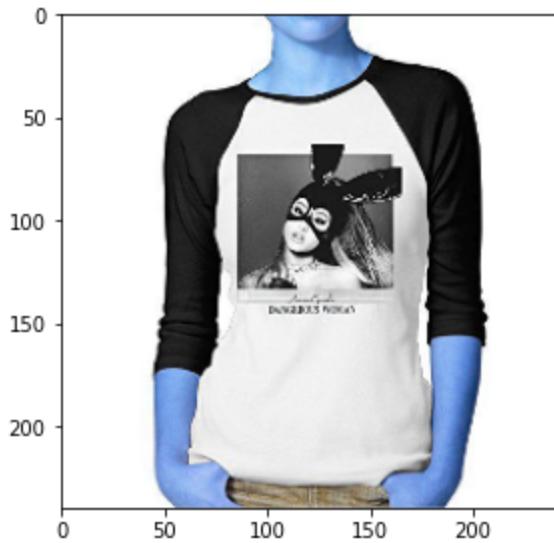
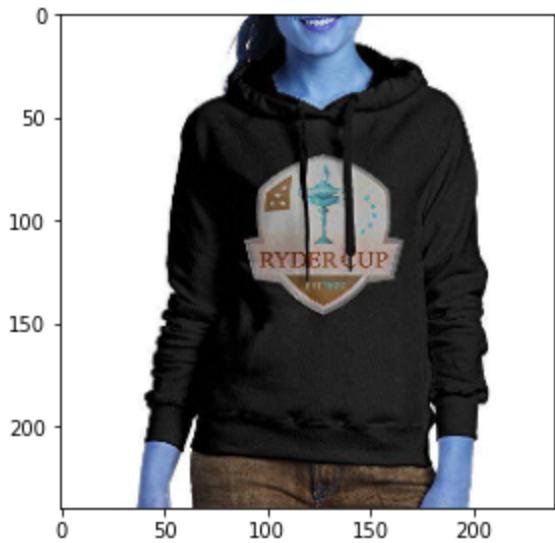
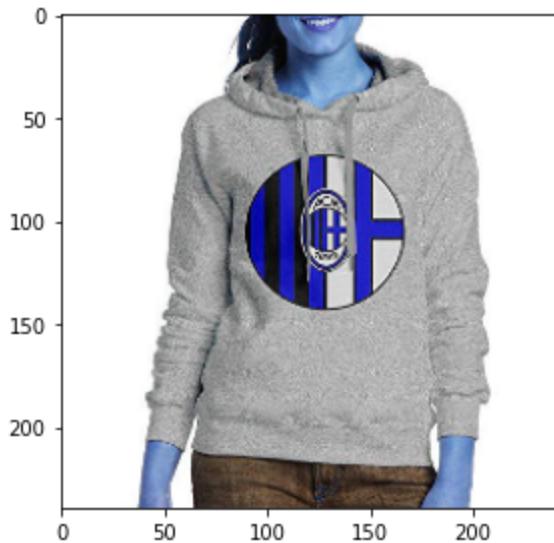
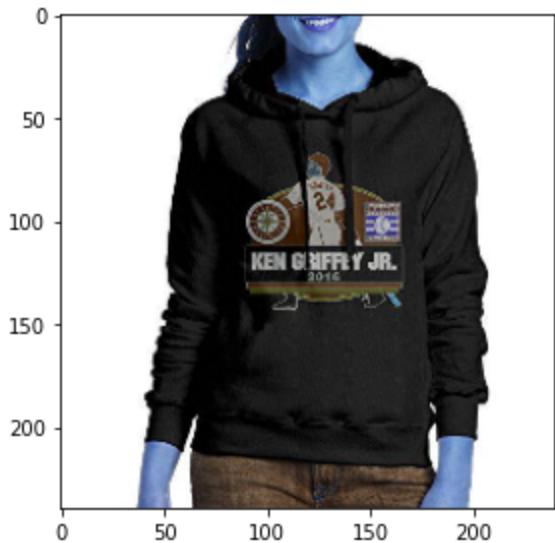
Image 3 - 2

Image 4 - 2

goto next yes(1) no(0)1

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Recommended Product 20 compute time 0.024693965911865234



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 1

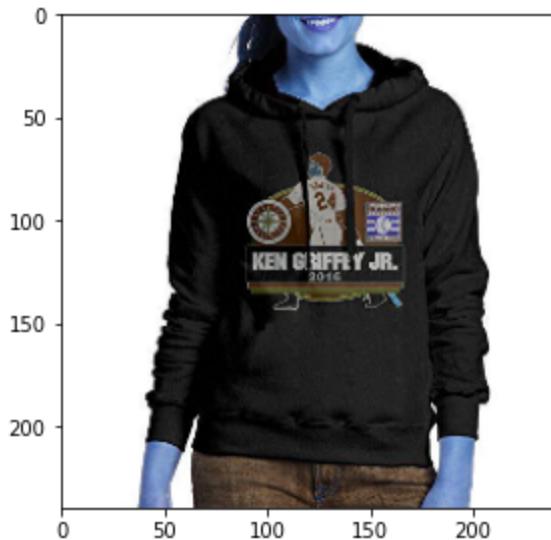
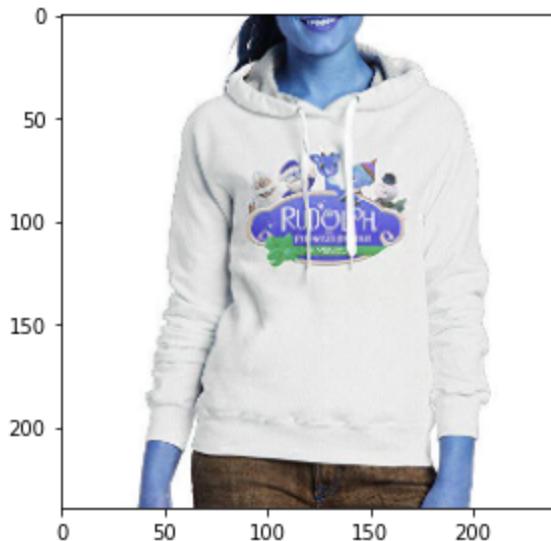
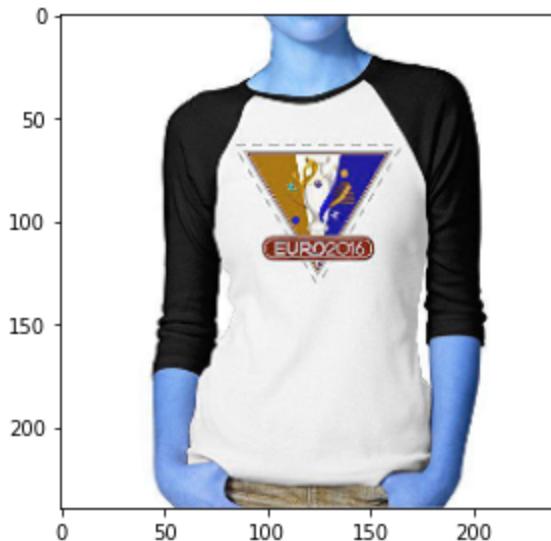
Image 3 - 1

Image 4 - 2

goto next yes(1) no(0)1

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Recommended Product 17 compute time 0.026469707489013672



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 2

Image 2 - 1

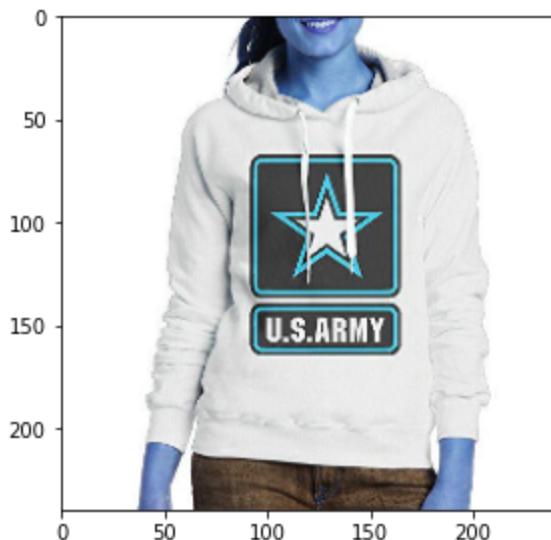
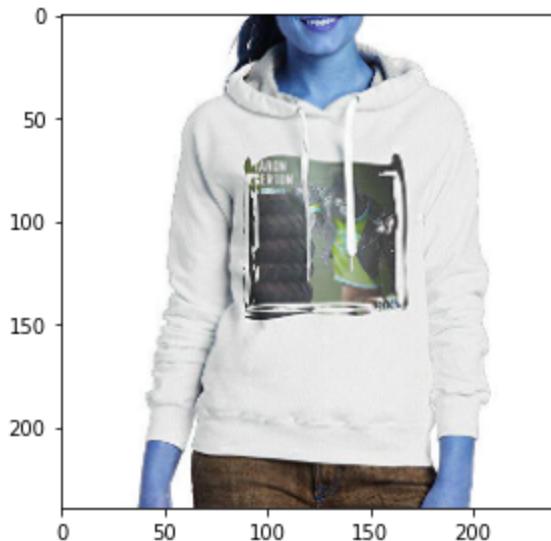
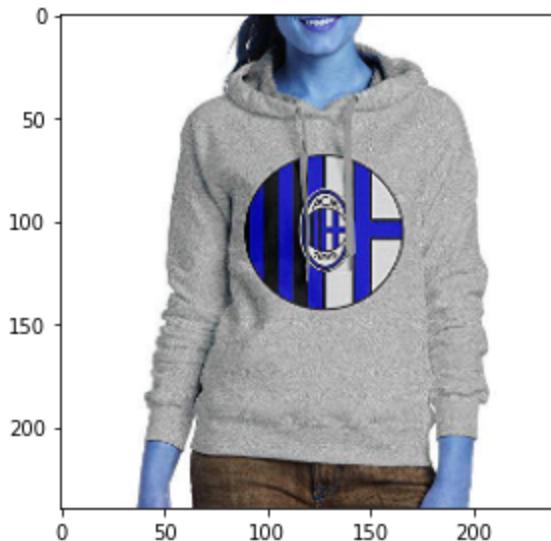
Image 3 - 2

Image 4 - 2

goto next yes(1) no(0)1

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Recommended Product 8 compute time 0.02117013931274414



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 1

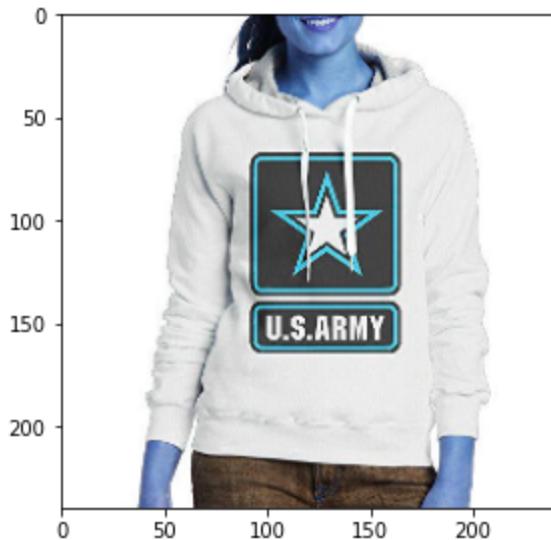
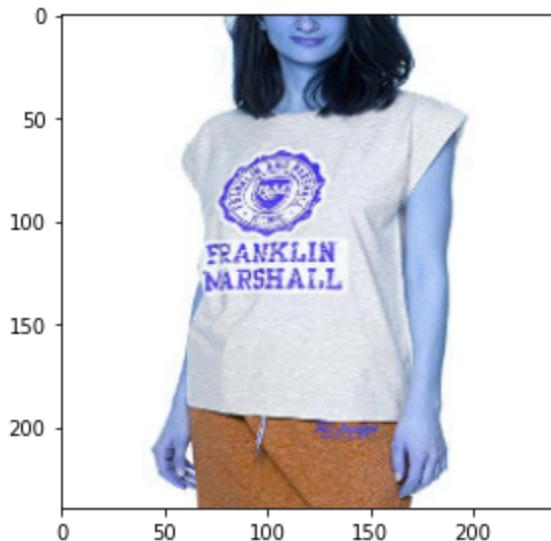
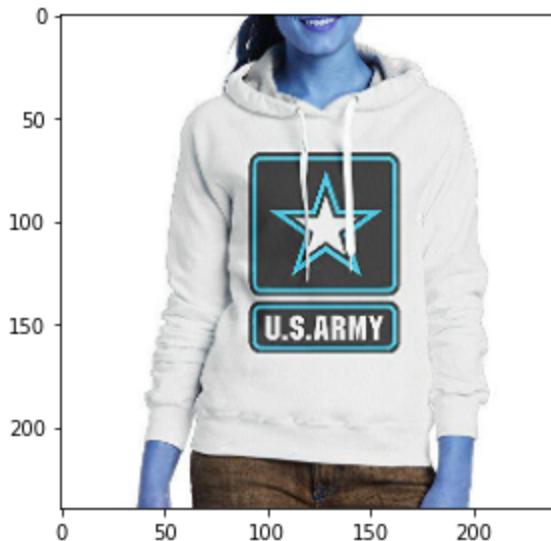
Image 3 - 2

Image 4 - 1

goto next yes(1) no(0)1

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Recommended Product 7 compute time 0.023264408111572266



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 2

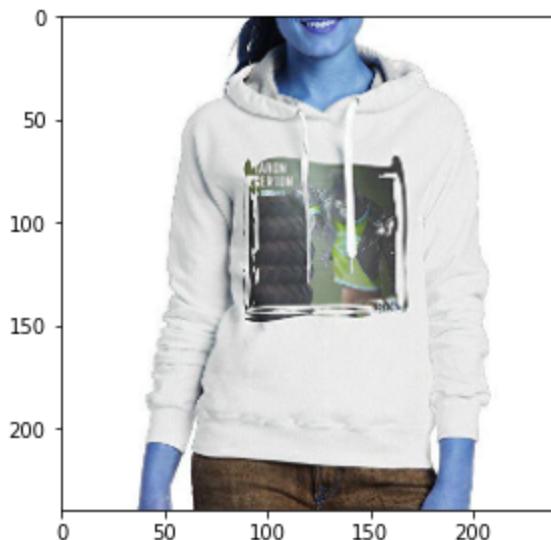
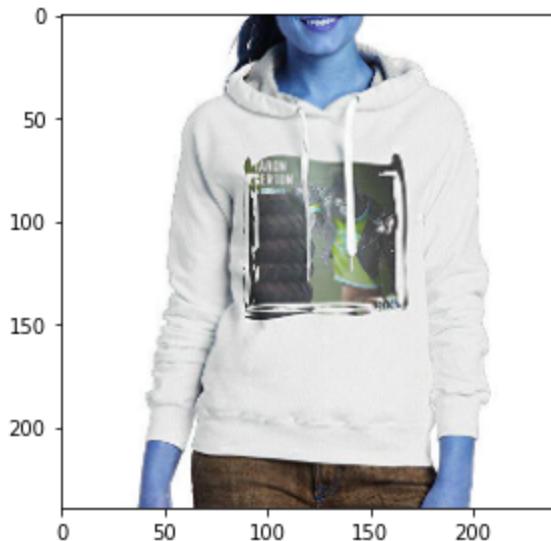
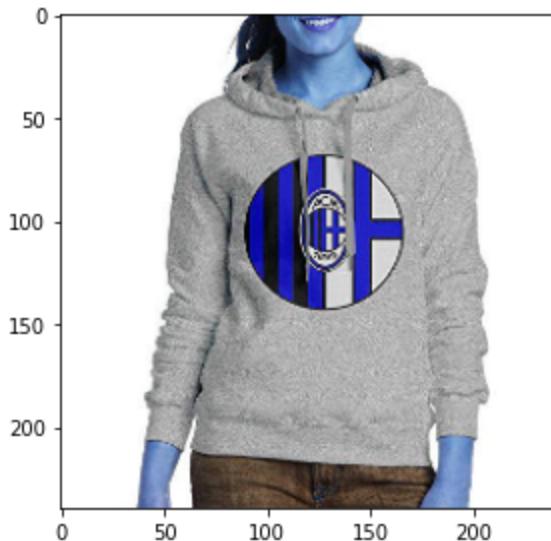
Image 3 - 2

Image 4 - 1

goto next yes(1) no(0)1

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Recommended Product 5 compute time 0.02378392219543457



Like = 1 Unlike = 2 Neutral = 3

Image 1 - 1

Image 2 - 1

Image 3 - 2

Image 4 - 1

goto next yes(1) no(0)1

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Recommended Product 5 compute time 0.02568960189819336

goto next yes(1) no(0)1

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Recommended Product 3 compute time 0.02620410919189453

goto next yes(1) no(0)0