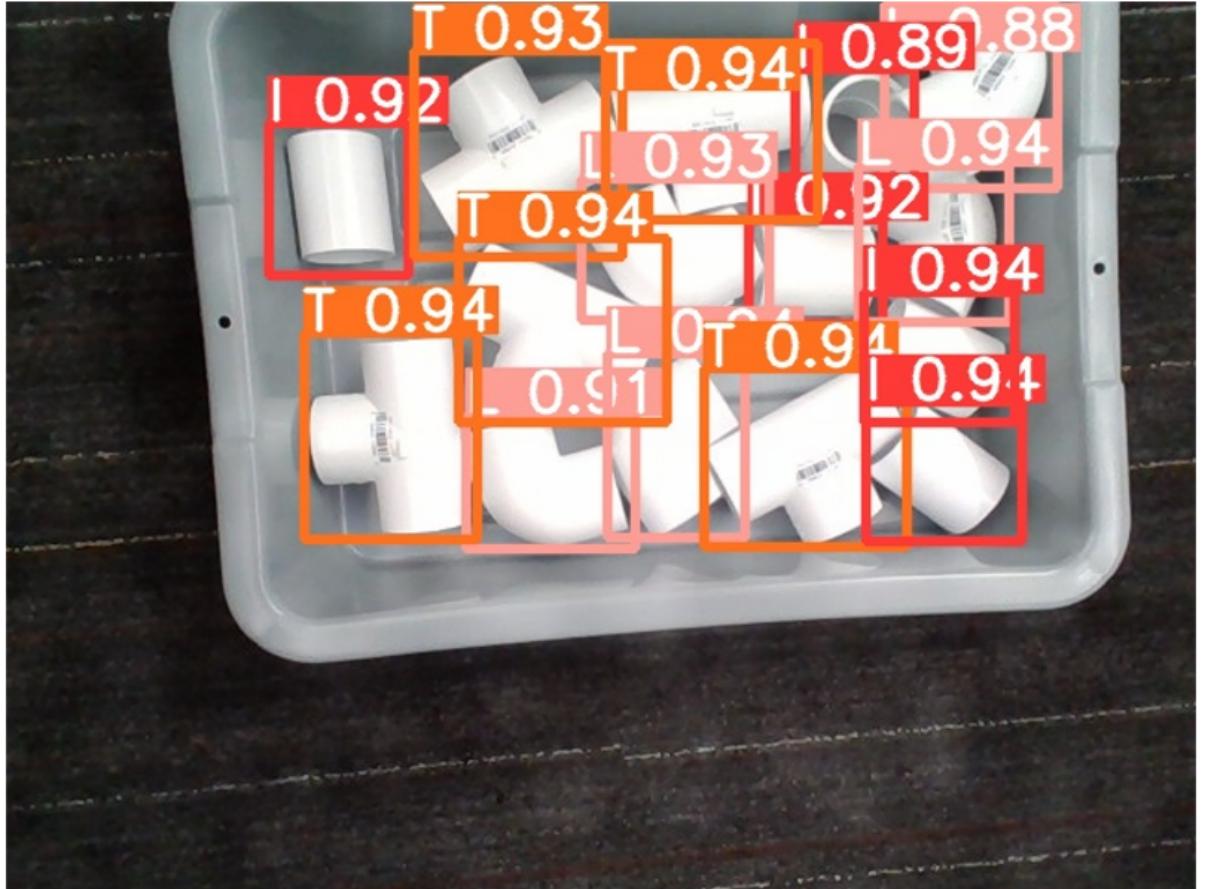


Total Parts: 6 Is, 5Ls, 5Ts

1. Missing Case : I-shaped hidden under the L-shaped on the top right corner



```
PS C:\Users\hanna\yolov5-final\yolov5> python final_code.py
data/images/image.jpg written!
[ WARN:0] global C:\Users\runneradmin\AppData\Local\Temp\pip-req-build-sn_xpupm\opencv\modules\videoio\src\cap_msmf.cpp (438)
`anonymous-namespace'::SourceReaderCB::~SourceReaderCB terminating async callback
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 5 Is, 5 Ls, 5 Ts, Done. (0.244s)
Enter the number of I shaped PVCs: 6
Enter the number of L shaped PVCs: 5
Enter the number of T shaped PVCs: 5
Name:data/images/image.jpg
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 5 Is, 5 Ls, 5 Ts, Done. (0.231s)
{'I': 5, 'L': 5, 'T': 5}
Error! 1 I is/are missing
1 I added to the CURRENT BIN from the PARTS BIN
PS C:\Users\hanna\yolov5-final\yolov5> []
```

After shaking the bin/ rearranging the parts



```
PS C:\Users\hanna\yolov5-final\yolov5> python final_code.py
data/images/image.jpg written!
[ WARN:0] global C:\Users\runneradmin\AppData\Local\Temp\pip-reg-build-sn_xpupm\opencv\modules\videoio\src\cap_msmf.cpp (438)
`anonymous-namespace'::SourceReaderCB::~SourceReaderCB terminating async callback
YOLOv5  v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 6 Is, 5 Ls, 5 Ts, Done. (0.291s)
Enter the number of I shaped PVCs: 6
Enter the number of L shaped PVCs: 5
Enter the number of T shaped PVCs: 5
Name:data/images/image.jpg
YOLOv5  v6.0-54-gac2c49a torch 1.9.1+cpu CPU

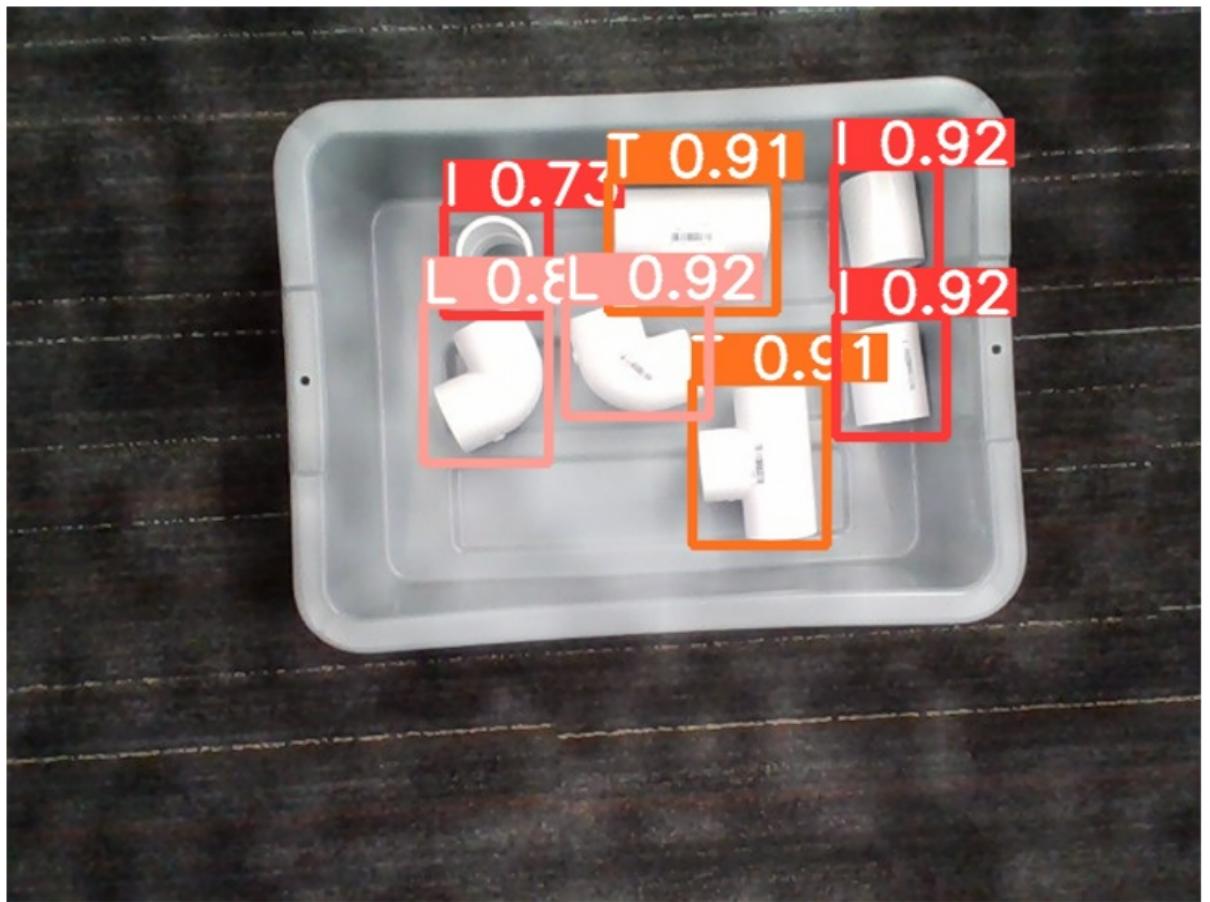
Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 6 Is, 5 Ls, 5 Ts, Done. (0.278s)
{'I': 6, 'L': 5, 'T': 5}
Entire order is here, move to the staging area

Performing image processing again

YOLOv5  v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 6 Is, 5 Ls, 5 Ts, Done. (0.246s)
{'I': 6, 'L': 5, 'T': 5}
Entire order is here, move to the staging area
PS C:\Users\hanna\yolov5-final\yolov5>
```

2. Excess Case : We should have 3Is, 2Ls and 2Ts in the bucket

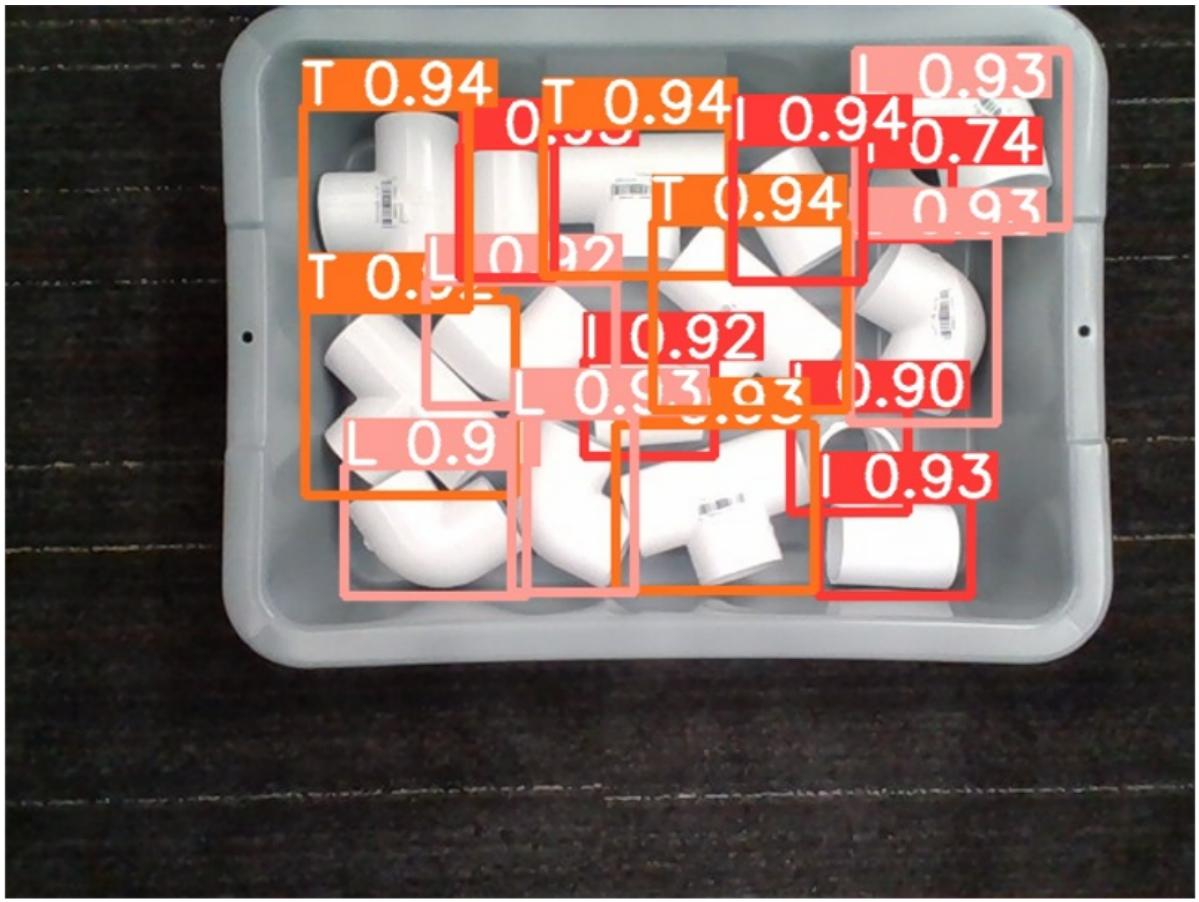


```
PS C:\Users\hanna\yolov5-final\yolov5> python final_code.py
data/images/image.jpg written!
[ WARN:0] global C:\Users\runneradmin\AppData\Local\Temp\pip-req-build-sn_xpum\opencv\modules\videoio\src\cap_msmf.cpp (438)
`anonymous-namespace'::SourceReaderCB::~SourceReaderCB terminating async callback
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 3 Is, 2 Ls, 2 Ts, Done. (0.242s)
Enter the number of I shaped PVCs: 3
Enter the number of L shaped PVCs: 2
Enter the number of T shaped PVCs: 0
Name:data/images/image.jpg
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 3 Is, 2 Ls, 2 Ts, Done. (0.345s)
{'I': 3, 'L': 2, 'T': 2}
Error! 2 T is/are excess
2 T removed from the CURRENT BIN to the PARTS BIN
PS C:\Users\hanna\yolov5-final\yolov5>
```

3. Detected Successfully



```
PS C:\Users\hanna\yolov5-final\yolov5> python final_code.py
data/images/image.jpg written!
[ WARN:0] global C:\Users\runneradmin\AppData\Local\Temp\pip-req-build-sn_xpum\opencv\modules\videoio\src\cap_msmf.cpp (438)
`anonymous-namespace'::SourceReaderCB::SourceReaderCB terminating async callback
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPS
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 6 Is, 5 Ls, 5 Ts, Done. (0.298s)
Enter the number of I shaped PVCs: 6
Enter the number of L shaped PVCs: 5
Enter the number of T shaped PVCs: 5
Name:data/images/image.jpg
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

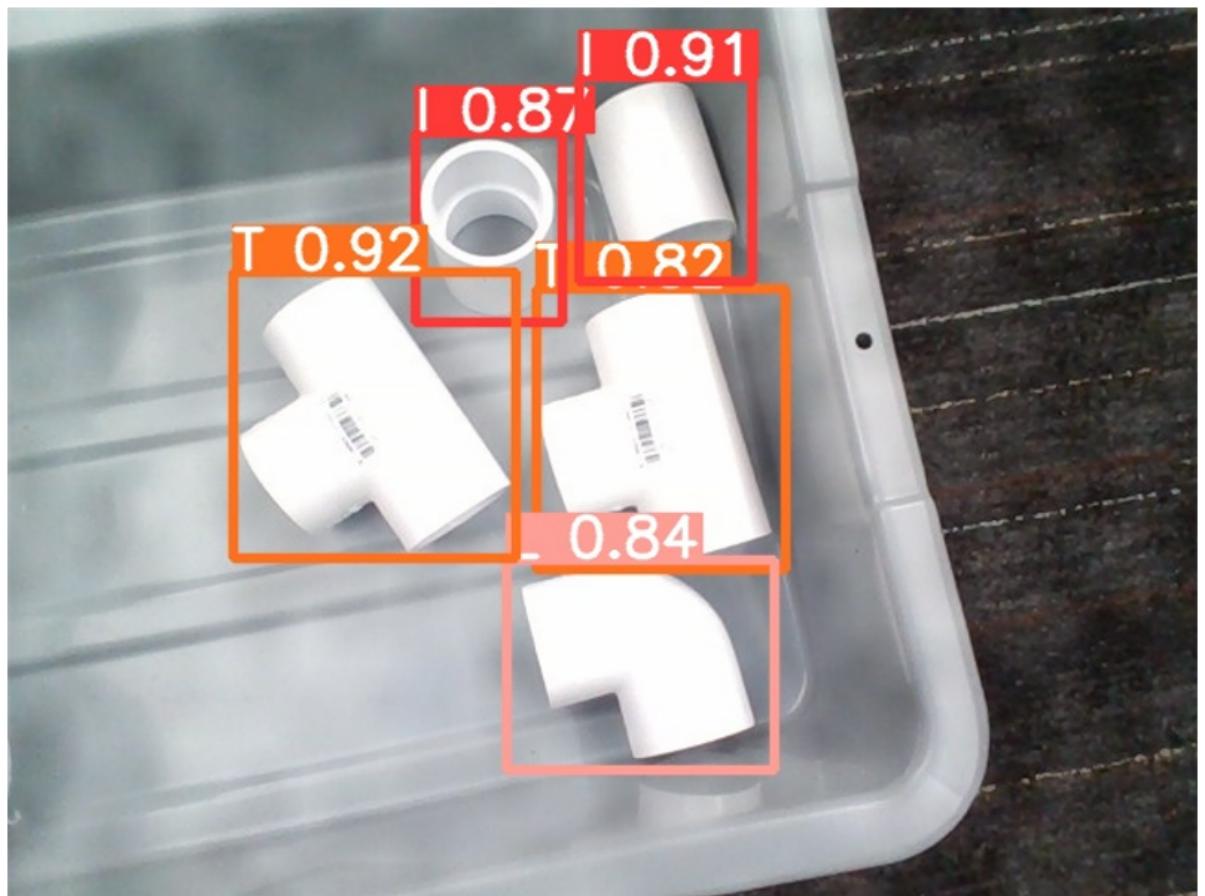
Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPS
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 6 Is, 5 Ls, 5 Ts, Done. (0.372s)
{'I': 6, 'L': 5, 'T': 5}
Entire order is here, move to the staging area

Performing image processing again

YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPS
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 6 Is, 5 Ls, 5 Ts, Done. (0.371s)
{'I': 6, 'L': 5, 'T': 5}
Entire order is here, move to the staging area
```

4. Moving camera angle - should have 3Is, 2Ls and 2Ts

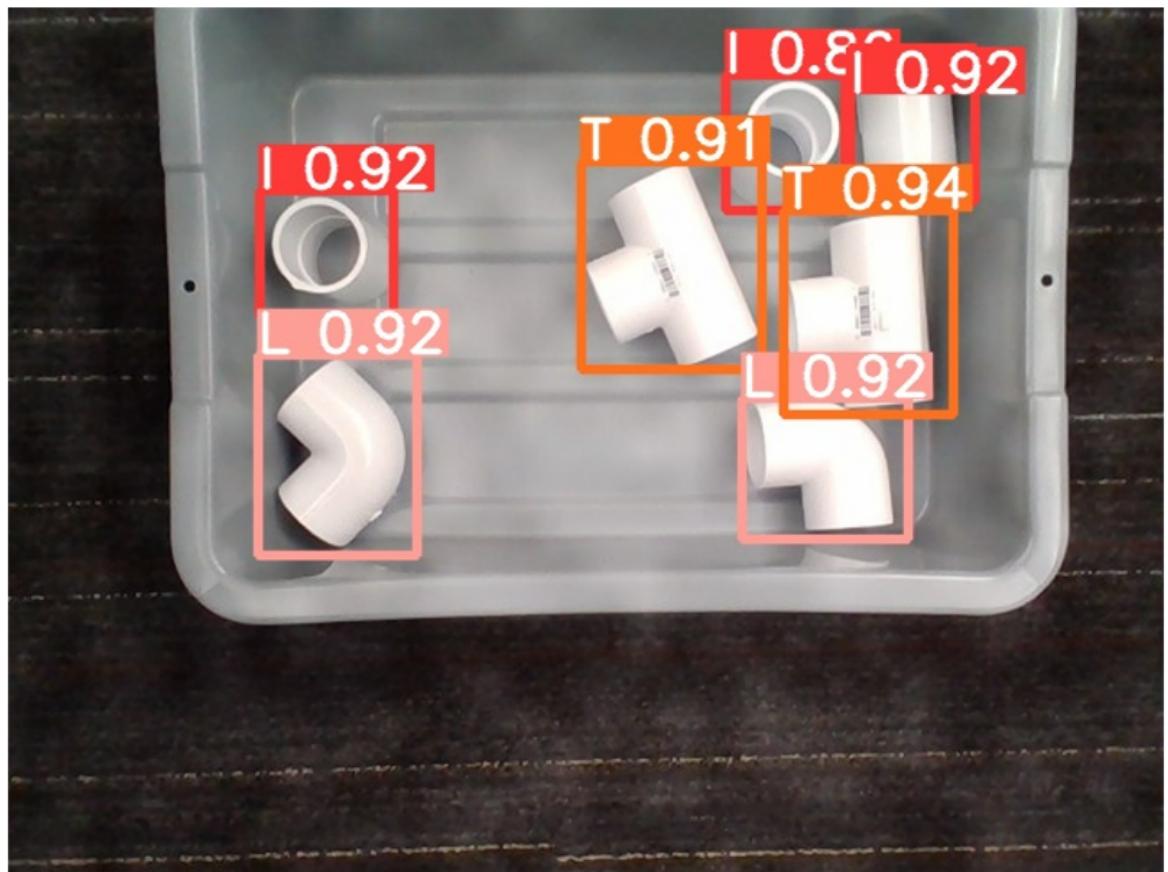


```
PS C:\Users\hanna\yolov5-final\yolov5> python final_code.py
data/images/image.jpg written!
[ WARN:0] global C:\Users\runneradmin\AppData\Local\Temp\pip-req-build-sn_xpum\opencv\modules\videoio\src\cap_msmf.cpp (438)
`anonymous-namespace'::SourceReaderCB::~SourceReaderCB terminating async callback
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 2 Is, 1 L, 2 Ts, Done. (0.311s)
Enter the number of I shaped PVCs: 3
Enter the number of L shaped PVCs: 2
Enter the number of T shaped PVCs: 2
Name:data/images/image.jpg
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 2 Is, 1 L, 2 Ts, Done. (0.340s)
{'I': 2, 'L': 1, 'T': 2}
Error! 1 I is/are missing
Error! 1 L is/are missing
1 I added to the CURRENT BIN from the PARTS BIN
1 L added to the CURRENT BIN from the PARTS BIN
PS C:\Users\hanna\yolov5-final\yolov5>
```

After changing the camera angle



```

PS C:\Users\hanna\yolov5-final\yolov5> python final_code.py
data/images/image.jpg written!
[ WARN:1] global C:/Users/runneradmin/AppData/Local/Temp/pip-req-build-sn_xpum/opencv/modules/videoio/src/cap_msmf.cpp (438)
`anonymous namespace'::SourceReaderCB::~SourceReaderCB terminating async callback
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:/Users/hanna/yolov5-final\yolov5\data\images\image.jpg: 480x640 3 Is, 2 Ls, 2 Ts, Done. (0.228s)
Enter the number of I shaped PVCs: 3
Enter the number of L shaped PVCs: 2
Enter the number of T shaped PVCs: 2
Name:data/images/image.jpg
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:/Users/hanna/yolov5-final\yolov5\data\images\image.jpg: 480x640 3 Is, 2 Ls, 2 Ts, Done. (0.358s)
{'I': 3, 'L': 2, 'T': 2}
Entire order is here, move to the staging area

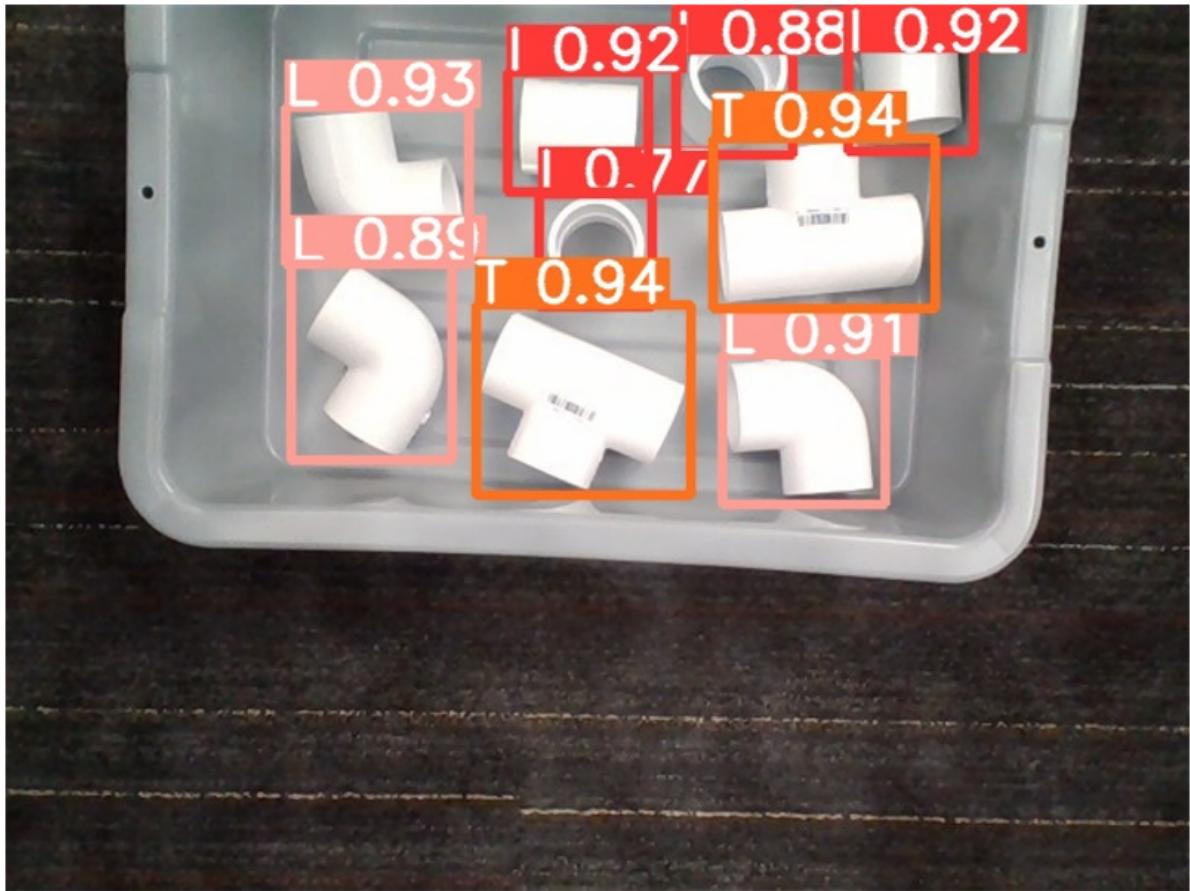
Performing image processing again

YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:/Users/hanna/yolov5-final\yolov5\data\images\image.jpg: 480x640 3 Is, 2 Ls, 2 Ts, Done. (0.345s)
{'I': 3, 'L': 2, 'T': 2}
Entire order is here, move to the staging area
PS C:/Users/hanna/yolov5-final\yolov5>

```

5. Missing + Excess Parts: Bucket has 4 Is, 3 Ls and 2Ts. Terminal we put 7 Is, 1 Ls and 2Ts



```
PS C:\Users\hanna\yolov5-final\yolov5> python final_code.py  
data/images/image.jpg written!  
[ WARN:1] global C:\Users\runneradmin\AppData\Local\Temp\pip-req-build-sn_xpupm\opencv\modules\videoio\src\cap_msmf.cpp (438)  
'anonymous-namespace'::SourceReaderCB::~SourceReaderCB terminating async callback
```

```
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU
```

```
Fusing layers...
```

```
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
```

```
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 4 Is, 3 Ls, 2 Ts, Done. (0.263s)
```

```
Enter the number of I shaped PVCs: 7
```

```
Enter the number of L shaped PVCs: 1
```

```
Enter the number of T shaped PVCs: 2
```

```
Name:data/images/image.jpg
```

```
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU
```

```
Fusing layers...
```

```
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
```

```
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 4 Is, 3 Ls, 2 Ts, Done. (0.343s)
```

```
{'I': 4, 'L': 3, 'T': 2}
```

```
Error! 3 I is/are missing
```

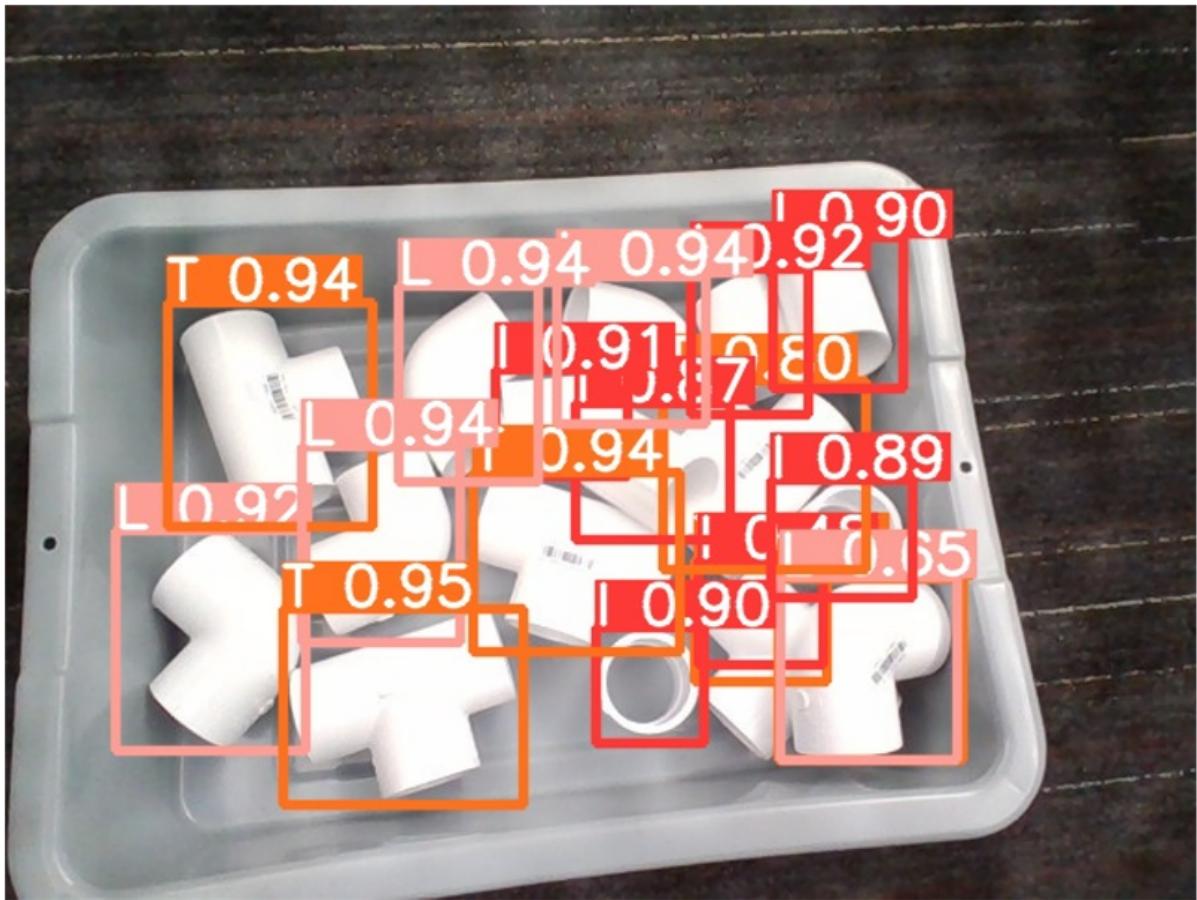
```
Error! 2 L is/are excess
```

```
3 I added to the CURRENT BIN from the PARTS BIN
```

```
2 L removed from the CURRENT BIN to the PARTS BIN
```

```
PS C:\Users\hanna\yolov5-final\yolov5> █
```

6. Heavily occluded - There are 6,5,5 in the bucket but its detecting 7, 5, 6

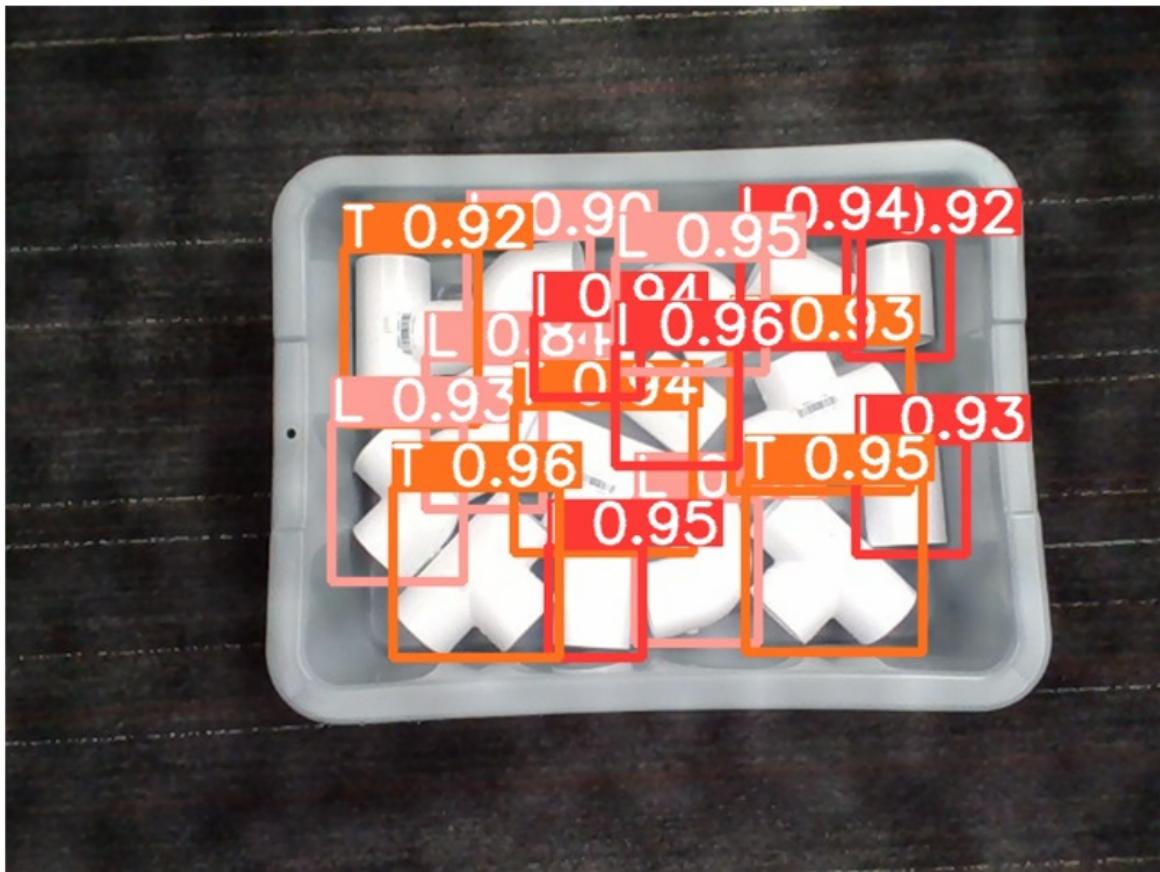


```
PS C:\Users\hanna\yolov5-final\yolov5> python final_code.py
data/images/image.jpg written!
[ WARN:0] global C:\Users\runneradmin\AppData\Local\Temp\pip-req-build-sn_xpum\opencv\modules\videoio\src\cap_msmf.cpp (438)
`anonymous-namespace'::SourceReaderCB::~SourceReaderCB terminating async callback
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 7 Is, 5 Ls, 6 Ts, Done. (0.226s)
Enter the number of I shaped PVCs: 6
Enter the number of L shaped PVCs: 5
Enter the number of T shaped PVCs: 5
Name:data/images/image.jpg
YOLOv5 v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 7 Is, 5 Ls, 6 Ts, Done. (0.344s)
{'I': 7, 'L': 5, 'T': 6}
Error! 1 I is/are excess
Error! 1 T is/are excess
1 I removed from the CURRENT BIN to the PARTS BIN
1 T removed from the CURRENT BIN to the PARTS BIN
PS C:\Users\hanna\yolov5-final\yolov5>
```

After shaking the bin



```
PS C:\Users\hanna\yolov5-final\yolov5> python final_code.py
data\images\image.jpg written!
[ WARN:0] global C:\Users\runneradmin\AppData\Local\Temp\pip-req-build-sn_xpupm\opencv\modules\videoio\src\cap_msmf.cpp (438)
`anonymous-namespace'::SourceReaderCB::~SourceReaderCB terminating async callback
YOLOv5  v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 6 Is, 5 Ls, 5 Ts, Done. (0.239s)
Enter the number of I shaped PVCs: 6
Enter the number of L shaped PVCs: 5
Enter the number of T shaped PVCs: 5
Name:data/images/image.jpg
YOLOv5  v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 6 Is, 5 Ls, 5 Ts, Done. (0.339s)
{'I': 6, 'L': 5, 'T': 5}
Entire order is here, move to the staging area

Performing image processing again

YOLOv5  v6.0-54-gac2c49a torch 1.9.1+cpu CPU

Fusing layers...
Model Summary: 213 layers, 7018216 parameters, 0 gradients, 15.8 GFLOPs
image 1/1 C:\Users\hanna\yolov5-final\yolov5\data\images\image.jpg: 480x640 6 Is, 5 Ls, 5 Ts, Done. (0.351s)
{'I': 6, 'L': 5, 'T': 5}
Entire order is here, move to the staging area
PS C:\Users\hanna\yolov5-final\yolov5>
```