Output of python main.py:

```
HP@DESKTOP-LNORTVI MINGW64 ~/project_python/BOMCalculation/version5 (main)
$ python main.py
[2026/02/21 01:48:38] ppocr DEBUG: Namespace(help='==SUPPRESS==', use_gpu=False,
 use_xpu=False, use_npu=False, ir_optim=True, use_tensorrt=False, min_subgraph_s
ize=15, precision='fp32', gpu_mem=500, gpu_id=0, image_dir=None, page_num=0, det
_algorithm='DB', det_model_dir='C:\\Users\\HP/.paddleocr\\whl\\det\\en\\en_PP-OCR
v3_det_infer', det_limit_side_len=960, det_limit_type='max', det_box_type='quad'
, det_db_thresh=0.3, det_db_box_thresh=0.6, det_db_unclip_ratio=1.5, max_batch_s
ize=10, use_dilation=False, det_db_score_mode='fast', det_east_score_thresh=0.8,
 det_east_cover_thresh=0.1, det_east_nms_thresh=0.2, det_sast_score_thresh=0.5,
det_sast_nms_thresh=0.2, det_pse_thresh=0, det_pse_box_thresh=0.85, det_pse_min_
area=16, det_pse_scale=1, scales=[8, 16, 32], alpha=1.0, beta=1.0, fourier_degre
e=5, rec_algorithm='SVTR_LCNet', rec_model_dir='C:\\Users\\HP/.paddleocr\\whl\\re
c\\en\\en_PP-OCRv4_rec_infer', rec_image_inverse=True, rec_image_shape='3, 48, 3
20', rec_batch_num=6, max_text_length=25, rec_char_dict_path='C:\\Users\\HP\\pro
ject_python\\BOMCalculation\\venv\\lib\\site-packages\\paddleocr\\ppocr\\utils\\
en_dict.txt', use_space_char=True, vis_font_path='./doc/fonts/simfang.ttf', drop
_score=0.5, e2e_algorithm='PGNet', e2e_model_dir=None, e2e_limit_side_len=768, e
2e_limit_type='max', e2e_pgnet_score_thresh=0.5, e2e_char_dict_path='./ppocr/uti
ls/ic15_dict.txt', e2e_pgnet_valid_set='totaltext', e2e_pgnet_mode='fast', use_a
ngle_cls=True, cls_model_dir='C:\\Users\\HP/.paddleocr\\whl\\cls\\ch_ppocr_mobile
_v2.0_cls_infer', cls_image_shape='3, 48, 192', label_list=['0', '180'], cls_bat
ch_num=6, cls_thresh=0.9, enable_mkldnn=False, cpu_threads=10, use_pdserving=Fal
se, warmup=False, sr_model_dir=None, sr_image_shape='3, 32, 128', sr_batch_num=1
, draw_img_save_dir='./inference_results', save_crop_res=False, crop_res_save_di
r='./output', use_mp=False, total_process_num=1, process_id=0, benchmark=False,
save_log_path='./log_output/', show_log=True, use_onnx=False, output='./output',
 table_max_len=488, table_algorithm='TableAttn', table_model_dir=None, merge_no_
span_structure=True, table_char_dict_path=None, layout_model_dir=None, layout_di
ct_path=None, layout_score_threshold=0.5, layout_nms_threshold=0.5, kie_algorith
m='LayoutXLM', ser_model_dir=None, re_model_dir=None, use_visual_backbone=True,
ser_dict_path='../train_data/XFUND/class_list_xfun.txt', ocr_order_method=None,
mode='structure', image_orientation=False, layout=True, table=True, ocr=True, re
covery=False, use_pdf2docx_api=False, invert=False, binarize=False, alphacolor=(
255, 255, 255), lang='en', det=True, rec=True, type='ocr', ocr_version='PP-OCRv4
', structure_version='PP-StructureV2')

--- STEP --- 1

--- STATE SIZE ---
63

--- LLM Response ---
{'tool_call': {'name': 'run_cv', 'arguments': {'image_path': 'pcbclear2.jpg'}}}

--- Tool Executed ---
run_cv
{'object_type': 'PCB', 'component_count': 350, 'min_area': 132, 'max_area': 3172
```

```
--- Tool Executed ---
run_cv
{'object_type': 'PCB', 'component_count': 350, 'min_area': 132, 'max_area': 3172
, 'mean_area': 844.7314285714285, 'coverage': 0.12023609962252381, 'type_counts'
: {'unknown': 294, 'capacitor': 39, 'IC': 17}, 'size_counts': {'tiny': 277, 'sma
ll': 73}}

--- STEP --- 2

--- STATE SIZE ---
308

--- LLM Response ---
{'tool_call': {'name': 'get_ic_info', 'arguments': {'image_path': 'pcbclear2.jpg
'}}}
[2026/02/21 01:50:44] ppocr DEBUG: dt_boxes num : 74, elapsed : 1.47945713996887
2
[2026/02/21 01:50:45] ppocr DEBUG: cls num  : 74, elapsed : 0.4445624351501465
[2026/02/21 01:50:47] ppocr DEBUG: rec_res num  : 74, elapsed : 1.99396872520446
78

--- OCR RAW TEXT (first 20) ---
['61', 'DA', 'R45', 'R48', 'R7', 'O36', 'J8', 'U3', 'R50', '81', '055', 'C.', 'C
21', '3A', 'C22', 'C19', 'J15', 'OS', 'R3', 'J1']

--- OCR REFERENCE COUNTS ---
{'R': 5, 'C': 6, 'U': 3, 'J': 3}

--- OCR IC CANDIDATES ---
['2O3ECW', '24J', '25R29C14', 'R62R63']

--- Tool Executed ---
get_ic_info
{'reference_counts': {'R': 5, 'C': 6, 'U': 3, 'J': 3}, 'ic_count_ocr': 4, 'possi
ble_ic_names': ['2O3ECW', '24J', '25R29C14', 'R62R63']}

--- STEP --- 3

--- STATE SIZE ---
439

--- LLM Response ---
{'tool_call': {'name': 'get_component_stats', 'arguments': {'image_path': 'pcbcl
ear2.jpg'}}}

--- Tool Executed ---
get_component_stats
```

```
--- LLM Response ---
{'tool_call': {'name': 'get_component_stats', 'arguments': {'image_path': 'pcbcl
ear2.jpg'}}}

--- Tool Executed ---
get_component_stats
{'component_count': 350, 'min_area': 132, 'max_area': 3172, 'mean_area': 844.731
4285714285, 'coverage': 0.12023609962252381, 'type_counts': {'unknown': 294, 'ca
pacitor': 39, 'IC': 17}}

--- STEP --- 4

--- STATE SIZE ---
374

--- LLM Response ---
{'final_answer': {'complexity': 'High', 'pcb_type': 'General Purpose', 'estimate
d_bom_inr': '20-1750 INR', 'reasoning': 'The component count is high with 350 co
mponents, indicating a complex design. The area covered by the components is mod
erate. While there are references to ICs and capacitors, the primary signal from
 CV suggests a general purpose PCB rather than specialized hardware.'}}

--- Reflection Response ---
{'final_answer': {'complexity': 'High', 'pcb_type': 'General Purpose', 'estimate
d_bom_inr': '20-1750 INR', 'reasoning': 'The component count is 350, indicating
a complex design. While OCR detected IC names and the area covered by components
 is moderate, CV-derived counts prioritize the analysis, supporting a general pu
rpose PCB classification.'}}
{'status': 'success', 'result': {'complexity': 'High', 'pcb_type': 'General Purp
ose', 'estimated_bom_inr': '20-1750 INR', 'reasoning': 'The component count is 3
50, indicating a complex design. While OCR detected IC names and the area covere
d by components is moderate, CV-derived counts prioritize the analysis, supporti
ng a general purpose PCB classification.'}, 'steps_used': 4}
(venv)
```

Output of [app.py](app.py):

Analysis

Time taken: 264.47 seconds

Agent completed in 3 step(s)

BOM Estimation Result

```json
{
    "complexity" : "High"
    "pcb_type" : "Custom PCB"
    "estimated_bom_inr" : "200-1750 INR"
    "reasoning" :
    "The PCB has a high component count and unknown components, indicating a custom
    design. Component counts from CV are consistent with the original answer. ICs
    are primarily labeled as reference designators rather than full names,
    supporting the custom nature of the PCB."
}
```