

AIR SQUAD AIR SQUAD AIR SQUAD AIR SQUAD

C³ AIR SQUAD

TRAINEE TASK SHEETS

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INTRODUCTION

OUR CLUB IS MORE THAN JUST A GATHERING OF HOBBYISTS; IT'S A HUB OF CREATIVITY, COLLABORATION, AND EXPLORATION. IN AN ERA WHERE DRONES HAVE TRANSCENDED THEIR TRADITIONAL USES AND ARE NOW INTEGRAL IN VARIOUS SECTORS SUCH AS CINEMATOGRAPHY, AGRICULTURE, SURVEYING, AND EMERGENCY RESPONSE, C3 AIRSQUAD STANDS AS A BEACON OF INNOVATION. WE PRIDE OURSELVES ON OUR DEDICATION TO STAYING AHEAD OF THE CURVE BY EMBRACING THE LATEST ADVANCEMENTS IN DRONE TECHNOLOGY.

AS A PART OF C3 AIRSQUAD, YOU'LL BE EXPOSED TO AN ARRAY OF OPPORTUNITIES TO LEARN, CREATE, AND INNOVATE. REGULAR WORKSHOPS, SEMINARS, AND HANDS-ON PROJECTS ENSURE THAT OUR MEMBERS REMAIN AT THE FOREFRONT OF THE DRONE REVOLUTION. WHETHER YOU'RE A SEASONED PROFESSIONAL OR A CURIOUS BEGINNER, OUR COMMUNITY PROVIDES A SUPPORTIVE ENVIRONMENT WHERE KNOWLEDGE IS SHARED, IDEAS ARE NURTURED, AND DREAMS TAKE FLIGHT.

- TEAM AIR SQUAD

EXECUTIVE TEAM



BHARATH S



SARAN E



AMITH D

MENTORS

CAPTAIN



DEV THIYYADI

VICE CAPTAIN



VIVEK VARDHAN

TREASURER



AARON MATHEWS

CLUB MANAGER



ABHIRAMI K

CREATIVE HEAD



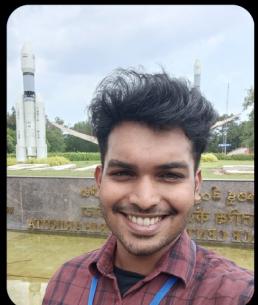
KARTHIK

CREATIVE HEAD



KANNAN

SCHRODINGER CAT



ASWIN S

MEDIA CO-ORDINATOR



MAITREYEE A

FLIGHT CONTROLLER



ADWAITH



MAITREYEE A

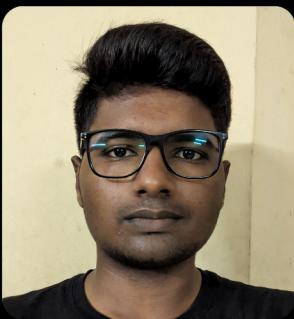


AVANTHIKA



PARTHIP

FABRICATION AND TOPOLOGY



ABHISHEK



TOM JACOB

GYMBALS AND CAMS



ABHIRAMI K



ADWAITH

FAIL SAFE AND PROPULSION



VIVEK VARDHAN



JIMIITESH



ADITHYAKRISHNAN



KARTHIK

GCS

AERODYNAMICS AND DESIGN



ANANDU S



ANAND



VYSHNAV V



VYSHNAV RAJ

SELECTION CRITERION

YOUR ASSIGNED RESPONSIBILITIES HAVE BEEN ORGANIZED INTO THREE DISTINCT SECTIONS. THE SUBSEQUENT TASK SEGMENT SERVES THE PURPOSE OF SKILL ASSESSMENT, PROVIDING YOU WITH A CONCISE PREVIEW OF THE UPCOMING CLUB ASSIGNMENTS. YOU ARE KINDLY REQUESTED TO OPT FOR A SINGLE SECTION, COMPRISING FIVE TASKS OF YOUR CHOICE. SPECIFIC SUBMISSION DEADLINES FOR YOUR COMPLETED TASKS WILL BE COMMUNICATED TO YOU BY BOTH THE CLUB MANAGER AND EXECUTIVES.

GUIDELINES FOR **TASK SUBMISSION**

- PERTINENT DUE DATES FOR EACH TASK WILL BE DULY COMMUNICATED BY THE CLUB MANAGER AND THE CLUB EXECUTIVES.
- YOUR SUBMISSIONS ARE EXPECTED TO ENCOMPASS ANY REQUISITE SCREENSHOTS AND SIMULATION VIDEOS, IF REQUESTED.
- CONSOLIDATE YOUR WORK WITHIN A SINGULAR FILE, WHICH SHOULD BE SUBMITTED IN A COMPRESSED ZIP FORMAT.
- THE DESIGNATED FILE NOMENCLATURE SHOULD ADHERE TO THE PRESCRIBED FORMAT: (YOUR NAME)_(TASK NAME).
- TIMELY EVALUATION OF YOUR SUBMISSIONS IS ASSURED, ACCOMPANIED BY THE PROVISION OF A SCOREBOARD PERTAINING TO EACH TASK GROUPING THROUGH THE DESIGNATED DISCORD CHANNEL.
- SUCCESSFUL CANDIDATES ARE REQUIRED TO CONVENE AT THE INNSPARK OFFICE TO PARTICIPATE IN A CONCLUSIVE INTERVIEW SESSION.



CODING TASK SET

GUIDELINES

- 1. THE PURPOSE OF THESE EXERCISES IS TO ASSESS YOUR FUNDAMENTAL GRASP OF CODING AND PROVIDE AN INTRODUCTION TO PYTHON PROGRAMMING.**
- 2. HERE'S HOW TO APPROACH THE TASKS:**
 - A) COMPREHEND THE PROBLEM.**
 - B) DEVISE AN ALGORITHM TO TACKLE IT.**
 - C) IMPLEMENT THE ALGORITHM IN CODE.**
 - D) VALIDATE AND TROUBLESHOOT THE CODE.**
- 3. EACH PROBLEM SHOULD INCLUDE THE CODE AND A SCREENSHOT OF THE EXECUTED OUTPUT.**
- 4. AVOID DIRECTLY REPLICATING SOLUTIONS. USE THESE EXERCISES TO UNDERSTAND CONCEPTS, IF NECESSARY, AND RESOLVE THE PROBLEMS IN YOUR OWN WORDS.**

PROGRAMMING TASKS

TASK 1

- A) WRITE A PROGRAM TO CHECK IF A NUMBER IS POSITIVE, NEGATIVE OR ZERO.
- B) WRITE A PROGRAM TO IMPLEMENT A CALCULATOR THAT SUPPORTS ADDITION, SUBTRACTION MULTIPLICATION AND DIVISION OPERATIONS.
- C) WRITE A PROGRAM TO SOLVE QUADRATIC EQUATION.

TASK 2

- A) WRITE A PROGRAM TO FIND ARMSTRONG NUMBER
- B) WRITE A PROGRAM TO PRINT THE FIBONACCI SEQUENCE
- C) WRITE A PROGRAM TO FIND ASCII VALUE OF A CHARACTER.

TASK 3

- A) WRITE A PROGRAM TO FIND FACTORIAL OF NUMBER USING RECURSION
- B) WRITE A PROGRAM TO REVERSE A STRING.
- C) WRITE A PROGRAM TO PRINT THE ELEMENTS OF AN ARRAY PRESENT ON ODD POSITION.

TASK 4

- A) WRITE A PROGRAM TO IMPLEMENT INSERTION SORT AS A FUNCTION.
- B) WRITE A PROGRAM TO CHECK IF THE GIVEN NUMBER IS A DISARIUM NUMBER.
- C) WRITE A PROGRAM TO COUNT THE OCCURRENCE OF EACH ELEMENT FROM A LIST.

TASK 5

- A) WRITE A PROGRAM THAT GENERATES A RANDOM PASSWORD OF A GIVEN LENGTH, CONSISTING OF LETTERS (BOTH UPPERCASE AND LOWERCASE), DIGITS, AND SPECIAL CHARACTERS.
- B) CREATE A PROGRAM THAT READS DATA FROM A CSV FILE, PERFORMS SOME CALCULATIONS, AND WRITES THE RESULTS TO ANOTHER CSV FILE.
- C) IMPLEMENT A STACK DATA STRUCTURE USING LISTS. INCLUDE METHODS FOR PUSH, POP, AND CHECKING IF THE STACK IS EMPTY.

ELECTRICAL TASK SET

GUIDELINES

- 1) THESE TASKS ARE TO TEST YOUR BASIC UNDERSTANDING OF CIRCUIT CONNECTION AND AN INTRODUCTION TO ARDUINO UNO.**
- 2) ALL THE TASKS HAVE TO BE DONE IN TINKERCAD. STUDENTS ARE REQUIRED TO SUBMIT A SCREENSHOT OF THE CIRCUIT ALONG WITH THE SOURCE CODE.**
- 3) NO COPYING OF THE EXACT SOLUTIONS FROM GOOGLE. YOU WOULD BE ASKED TO EXPLAIN THE TASKS AND HOW YOU SOLVED IT.**
- 4) YOU CAN USE YOUTUBE COURSES REGARDING HOW TO USE TINKERCAD**

ELECTRICAL TASKS

TASK 1

DESIGN A CIRCUIT FOR STAIRCASE WIRING. USE A TWO-WAY SWITCH FOR THE OPERATION.

TASK 2

DESIGN A CIRCUIT FOR GODOWN WIRING.

TASK 3

DESIGN A LIGHTING SYSTEM FOR YOUR VEHICLE THAT WOULD AUTOMATICALLY TURN ON WHEN IT IS DARK AND TURN OFF WHEN IT IS DAY TIME. USE LDR SENSOR FOR DETECTING LIGHT AND IMPLEMENT USING ARDUINO UNO.

TASK 4

DESIGN A FAN THAT WOULD AUTOMATICALLY TURN ON WHEN TEMPERATURE IS GREATER THAN 250 C AND ADJUST ITS SPEED ACCORDING TO TEMPERATURE. YOU CAN USE A TEMPERATURE SENSOR AND ACCORDINGLY CONTROL THE SERVO MOTOR WHICH IS USED AS THE FAN. REMEMBER TO USE THE PWM PINS OF ARDUINO UNO

TASK 5

DESIGN A PARKING SPACE AVAILABILITY DETECTOR USING ULTRASONIC SENSOR AND ARDUINO. IT SHOULD CONTAIN 3 LEDS RED, YELLOW, GREEN. WHEN THE VEHICLE IS AT A DISTANCE OF 400-350 CM, THE GREEN LIGHT SHOULD GLOW. IF THE VEHICLE IS IN THE RANGE OF 250-350 CM, GREEN SHOULD TURN OFF AND YELLOW SHOULD GLOW. IF THE VEHICLE IS IN THE RANGE OF 0-250 CM, YELLOW SHOULD TURN OFF AND RED SHOULD GLOW, INDICATING THERE IS LESS AVAILABLE SPACE

MECHANICAL TASK SET

GUIDELINES

THESE ACTIVITIES HAVE BEEN DESIGNED TO EVALUATE YOUR PROFICIENCY IN ANALYZING DRAWING SKILLS AND MODELING CAPABILITIES.

FOR FUNDAMENTAL DRAWING:

1. UNDERSTAND THE CHALLENGE: GRASP THE REQUIREMENTS OF THE DRAWING, INCLUDING THE NECESSARY SHAPES AND DIMENSIONS.
2. FORMULATE THE DRAWING CONCEPT: ENVISION THE APPEARANCE OF THE DRAWING, TAKING INTO ACCOUNT THE RELATIVE ARRANGEMENT OF ELEMENTS.
3. CRAFT A PRELIMINARY SKETCH: UTILIZE A PENCIL AND PAPER TO OUTLINE THE FUNDAMENTAL STRUCTURE OF THE DRAWING, ENSURING PRECISE MEASUREMENTS.
4. INTEGRATE MEASUREMENTS: CLEARLY LABEL THE DIMENSIONS ON YOUR SKETCH.
5. REVIEW AND ENHANCE: VERIFY IF THE SKETCH ACCURATELY REPRESENTS THE DEMANDED DRAWING.
6. DOCUMENT YOUR APPROACH: NOTE DOWN YOUR NAME, ROLL NUMBER, AND ANY STRATEGIES YOU EMPLOYED ON THE SAME SHEET.
7. CAPTURE AN IMAGE: EMPLOY A CAMERA OR SMARTPHONE TO TAKE A CLEAR PHOTOGRAPH OF YOUR SKETCH.
8. UPLOAD THE IMAGE: IF NECESSARY, SHARE THE PHOTOGRAPH ON THE ASSIGNED PLATFORM.

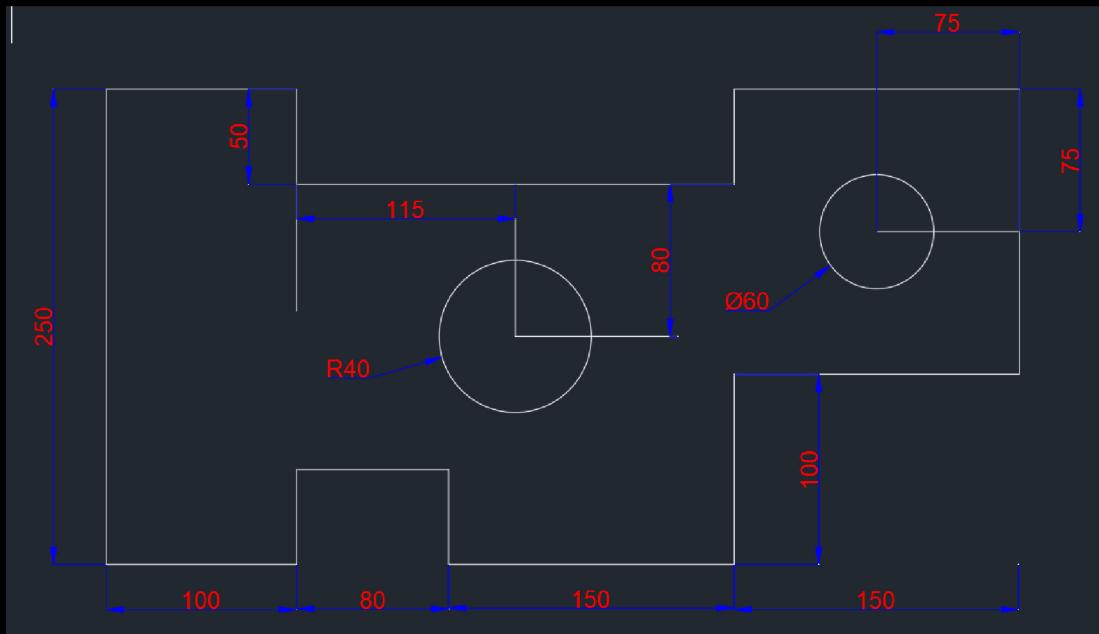
FOR ADVANCED DRAWING:

1. ANALYZE THE COMPLEXITY: GRASP THE INTRICACY OF THE DRAWING AND ITS INDIVIDUAL ELEMENTS.
2. SKETCH THE ELEMENTS: DISSECT THE DRAWING INTO ITS SEPARATE COMPONENTS AND SKETCH EACH ONE INDIVIDUALLY.
3. CREATE A UNIFIED COMPOSITION: MERGE THE DISTINCT COMPONENTS WITHIN A SINGLE SKETCH, ENSURING THEIR PROPER ALIGNMENT.
4. INTEGRATE ACCURATE MEASUREMENTS: CLEARLY ANNOTATE ALL DIMENSIONS ON THE SKETCH.
5. UTILIZE AUTOCAD: UTILIZE THE SKETCHED COMPONENTS AS A REFERENCE AND RECREATE THEM USING AUTOCAD'S TOOLS.
6. APPLY PRECISE MEASUREMENTS: UTILIZE AUTOCAD'S DIMENSIONING TOOLS TO INCORPORATE ACCURATE MEASUREMENTS.
7. REVIEW AND ADJUST: THOROUGHLY INSPECT THE DRAWING FOR PRECISION AND MAKE ANY NECESSARY REFINEMENTS.
8. DOCUMENT YOUR PROCESS: KEEP A RECORD OF THE STEPS TAKEN AND THE AUTOCAD TOOLS UTILIZED.
9. SAVE/EXPORT THE DRAWING: SAVE THE AUTOCAD DRAWING FILE AND, IF REQUIRED, EXPORT IT TO A SUITABLE FORMAT FOR SUBMISSION.

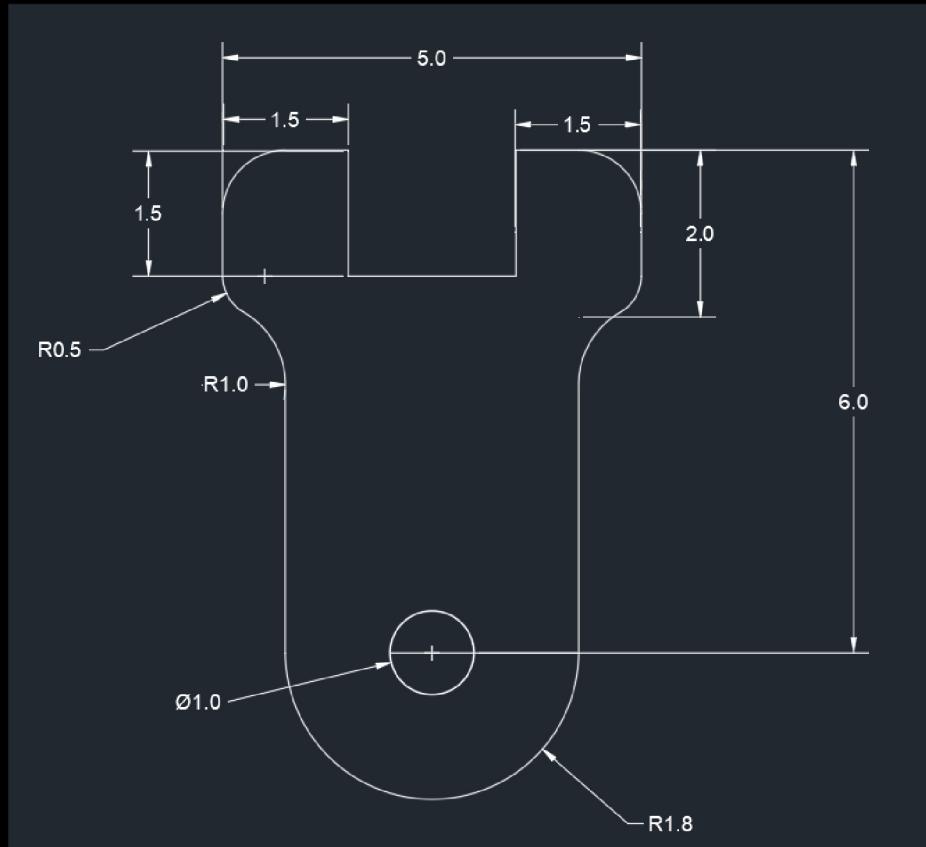
ALWAYS BEAR IN MIND THAT THESE TASKS SERVE TO ASSESS YOUR MASTERY OF DRAWING AND AUTOCAD. STRIVE FOR PRECISION, METICULOUSNESS, AND ADHERENCE TO PROFESSIONAL STANDARDS THROUGHOUT THE PROCESS. IF YOU HAVE ANY SPECIFIC INQUIRIES ABOUT THE DRAWING PROCEDURE OR USING AUTOCAD, DON'T HESITATE TO ASK!

MECHANICAL TASKS

TASK 1

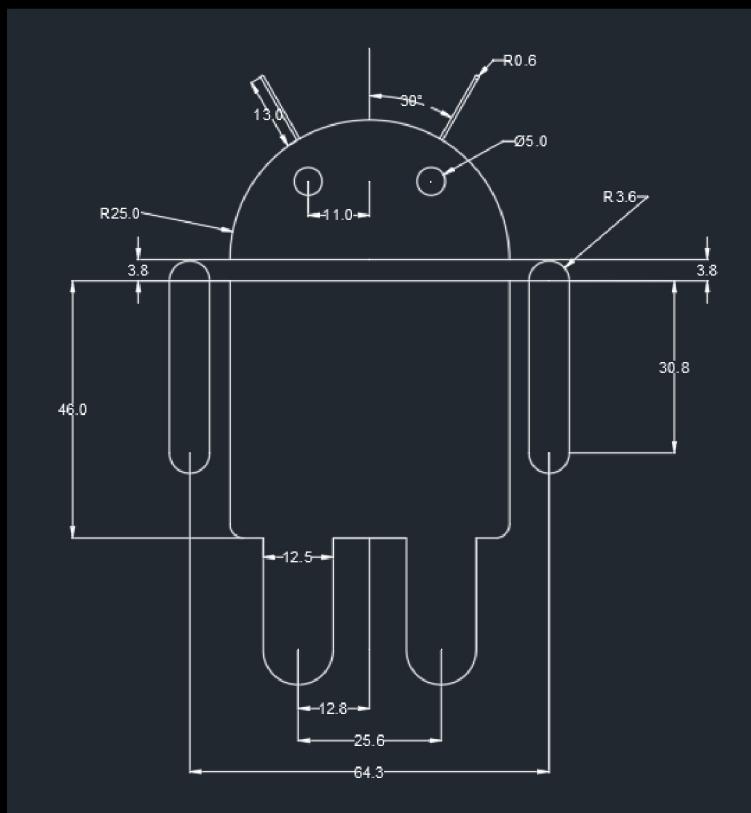


TASK 2

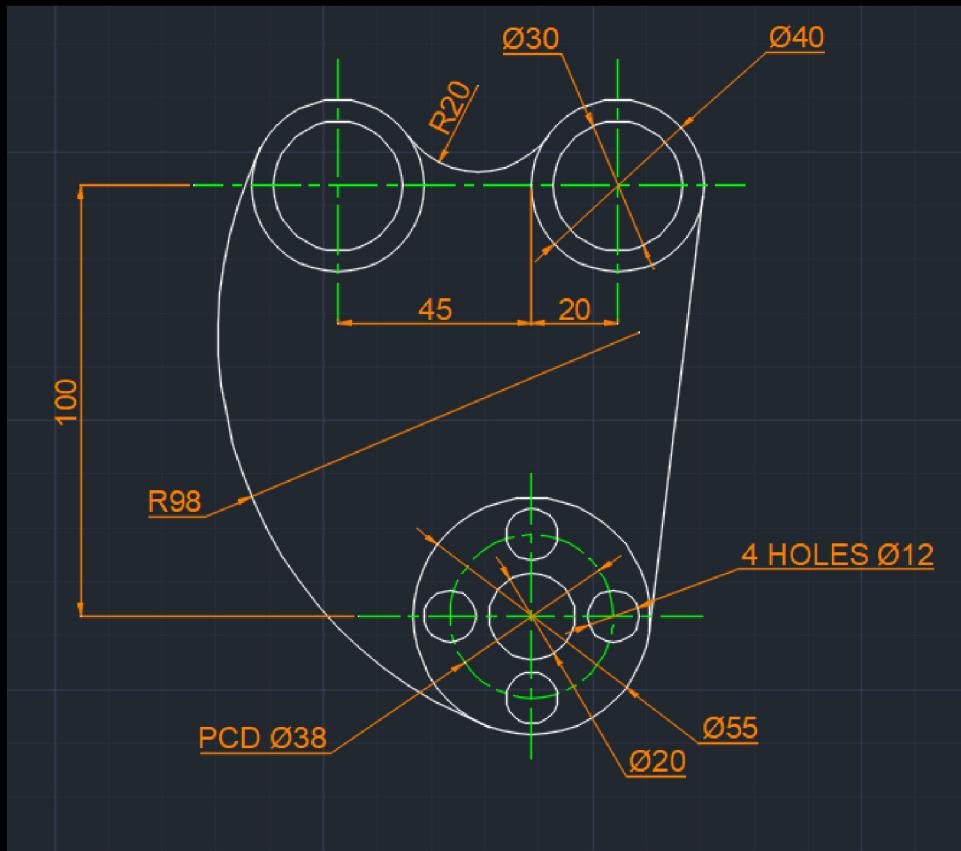


MECHANICAL TASKS

TASK 3

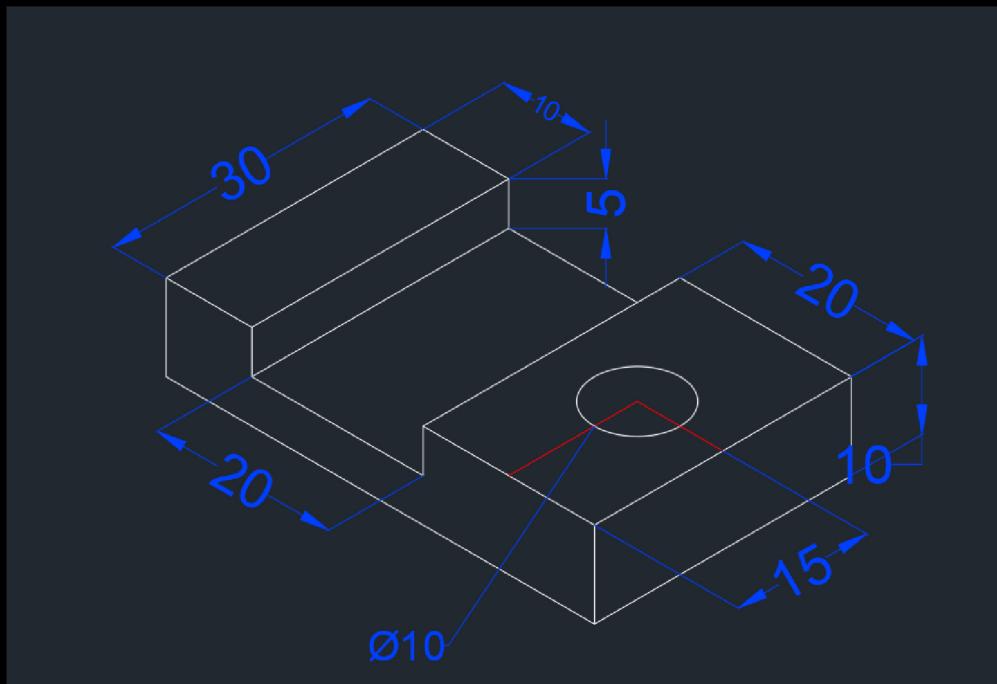


TASK 4



MECHANICAL TASK

TASK 5





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