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SECTION – BA(2)

CLASS ROLL NO. – 72

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MINI PROJECT

01 – BASIC CALCULATOR

```
def add(x,y):  
    return x+y  
  
def subtraction(x,y):  
    return x-y  
  
def multiply(x*y):  
    return x*y  
  
def divide(x,y):  
    return x/y  
  
print("select operation.")  
print("1. Add")  
print("2. Subtract")  
print("3. Multiply")  
print("4. Divide")  
  
while True:  
    choice = input("enter choice(1/2/3/4): ")  
    if choice in ('1' , '2' , '3' , '4'):  
        try:  
            num1 = float(input("enter first number: "))  
            num2 = float(input("enter first number: "))  
        except ValueError:  
            print("Invalid input , Please enter a number .")  
            continue
```

```

if choice == '1':
    print(num1, "+", num2, "=", add(num1,num2))

elif choice == '2':
    print(num1, "-", num2, "=", subtract(num1, num2))

elif choice == '3':
    print(num1, "*", num2, "=", multiply(num1, num2))
elif choice == '4':
    print(num1, "/", num2, "=", divide(num1,num2))


next_calculation = input("Let's do next calculation?
(yes/no): ")

if next_calculation == "no":
    break
else:
    print("invalid input")

```

02 – NUMBER SYSTEM

```

import random

def forward(num):
    return num+1

def backward(num):
    return num-1

def horizontal(num):
    return num*2

def vertical(num):
    return num/2

def generate_random_number():
    return random.randint(1,100)

```

```

def number_system():
    current_number = generate_random_number()

print("Welcome to the Number System!")
print("You are currently at:", current_number)

while True:
    print("\nChoose your movement:")
    print("1. Forward")
    print("2. Backward")
    print("3. Horizontal")
    print("4. Vertical")
    print("5. Quit")

    choice = input("enter your choice(1/2/3/4/5):")
    if choice == '1':
        current_number = forward(current_number)
    elif choice == '2':
        current_number = backward(current_number)
    elif choice == '3':
        current_number = horizontal(current_number)
    elif choice == '4':
        current_number = vertical(current_number)
    elif choice == '5':
        print("Exiting the Number System . Goodbye!")
        break
    else:
        print("Invalid choice! Please enter a valid option.")
        print("You are now at:",current_number)

```

number_system()

03 – VOTING SYSTEM

```
class VotingSystem:
```

```
    def __init__(self):
```

```
        self.candidates = {}
```

```
    def add_candidate(self,name):
```

```
        if name not in self.candidates:
```

```
            self.candidates[name] = 0
```

```
            print(f "{name} has been added as a candidate.")
```

```
        else:
```

```
            print(f "{name} is already a candidate.")
```

```
    def vote(self,name):
```

```
        if name in self.candidates:
```

```
            self.candidates[name] +=1
```

```
            print(f "Thank you for voting for {name}.")
```

```
        else:
```

```
            print(f "{name} is not a valid candidate.")
```

```
    def get_results(self):
```

```
        print("Election Results:")
```

```
        for candidate, votes in self.candidates.items():
```

```
            print(f "{candidate}:{vote} votes")
```

```
voting_system = VotingSystem()
```

```
voting_system.add_candidate("candidate A")
```

```
voting_system.add_candidate("candidate B")  
voting_system.add_candidate("candidate C")
```

```
voting_system.vote("Candidate A")  
voting_system.vote("Candidate B")
```

```
voting_system.vote("Candidate C")  
voting_system.vote("Candidate D")
```

```
voting_system.get_results()
```

04 – GRADING SYSTEM

```
import random  
def grade_marks(marks):  
  
    if marks >= 90:  
  
        return "A"  
  
    elif marks >= 80:  
  
        return "B"  
  
    elif marks >= 70:  
  
        return "C"
```

```
elif marks >= 60:
```

```
    return "D"
```

```
elif marks >= 50:
```

```
    return "E"
```

```
else:
```

```
    return "F"
```

```
def add_bonus(marks):
```

```
    bonus = random.randint(0, 10)
```

```
    return marks + bonus
```

```
def subtract_penalty(marks):
```

```
    penalty = random.randint(0, 5)
```

```
    return max(0, marks - penalty)
```

```
def marks_grading_system():
```

```
    student_name = input("Enter student's name: ")
```

```
student_marks = float(input("Enter student's marks: "))
```

```
student_marks = add_bonus(student_marks)
```

```
student_marks = subtract_penalty(student_marks)
```

```
grade = grade_marks(student_marks)
```

```
print("\nStudent Name:", student_name)
```

```
print("Original Marks:", student_marks)
```

```
print("Grade:", grade)
```

```
marks_grading_system()
```

05 – INVENTORY SYSTEM

```
import random
```

```
def hdn4wrd_purchase(item, price, amount):
```

```
    total_cost = price * amount
```

```
    return total_cost
```

```
def rv3rse_change(given, total_cost):
```

```
    return given - total_cost
```

```
def v3rt1c4l_count_notes(change):
```

```
    notes = [500, 200, 100, 50, 10, 5, 2, 1]
```

```
    notes_count = {}
```

```
    for note in notes:
```

```
        count = change // note
```

```
        if count > 0:
```

```
            notes_count[note] = count
```

```
            change %= note
```

```
    return notes_count
```

```
def inventory_system():
```

```
    inventory = {
```



```
"item1": 10,  
  
"item2": 20,  
  
"item3": 15  
  
}
```

```
while True:
```

```
    print("\nAvailable Items:")
```

```
    for item, quantity in inventory.items():
```

```
        print(f"{item}: {quantity}")
```

```
    item = input("\nEnter the item you want to purchase: ")
```

```
    if item not in inventory:
```

```
        print("Item not available! Please choose again.")
```

```
        continue
```

```
    price = random.randint(5, 100)
```

```
    amount = int(input(f"Enter the quantity of {item} you want to buy: "))
```

```
total_cost = hdn4wrд_purchase(item, price, amount)
```

```
print(f"Total cost for {amount} {item}: {total_cost}")
```

```
given = float(input("Enter the amount given: "))
```

```
change = rv3rse_change(given, total_cost)
```

```
if change < 0:
```

```
    print(f"You still need to pay {-change} more.")
```

```
elif change == 0:
```

```
    print("Exact amount given. Thank you!")
```

```
else:
```

```
    print(f"Change to be returned: {change}")
```

```
    notes_count = v3rt1c4l_count_notes(change)
```

```
    print("Number")
```

06 – NUMBER GUESSING GAME

```
import random

def generate_number():

    return random.randint(1, 100)

def guess_number():

    print("Welcome to the Number Guessing Game!")

    print("I'm thinking of a number between 1 and 100.")

    secret_number = generate_number()

    attempts = 0

    while True:

        guess = input("Take a guess: ")

        if not guess.isdigit():

            print("Please enter a valid number.")

            continue

        guess = int(guess)

        attempts += 1

        if guess < secret_number:

            print("Too low! Try again.")

        elif guess > secret_number:
```

```
        print("Too high! Try again.")

    else:

        print(f"Congratulations! You guessed it right in {attempts}
attempts!")

        break

guess_number()
```

07 – ROLL THE DICE

```
import random

def roll_dice(num_dice=1, num_sides=6):

    if num_dice <= 0 or num_sides <= 0:

        return "Invalid input! Number of dice and number of sides must be
positive integers."

    results = []

    for _ in range(num_dice):

        roll_result = random.randint(1, num_sides)

        results.append(roll_result)

    return results
```

```
def main():

    print("Welcome to Roll the Dice!")

    num_dice = int(input("Enter the number of dice to roll: "))

    num_sides = int(input("Enter the number of sides for each die: "))

    dice_results = roll_dice(num_dice, num_sides)

    print("Results:", dice_results)

if __name__ == "__main__":

    main()
```

08 – ROCK PAPER SCISSOR

```
import random

def computer_choice():

    choices = ['rock', 'paper', 'scissors']

    return random.choice(choices)

def player_choice():

    choice = input("Enter your choice (rock/paper/scissors): ").lower()

    if choice in ['rock', 'paper', 'scissors']:

        return choice
```

else:

print("Invalid choice! Please enter 'rock', 'paper', or 'scissors'.")

return player_choice()

def determine_winner(player, computer):

if player == computer:

return "It's a tie!"

elif (player == 'rock' and computer == 'scissors') or (player == 'paper'
and computer == 'rock') or (player == 'scissors' and computer ==
'paper'):

return "You win!"

else:

return "Computer wins!"

def play_game():

print("Let's play Rock, Paper, Scissors!")

player = player_choice()

computer = computer_choice()

print("You chose:", player)

```
print("Computer chose:", computer)
```

```
print(determine_winner(player, computer))
```

```
play_game()
```

-----THANK YOU-----